Prepared for:

Texas City
EST. 1911

City of Texas City Hazard Mitigation Plan

10/27/2025

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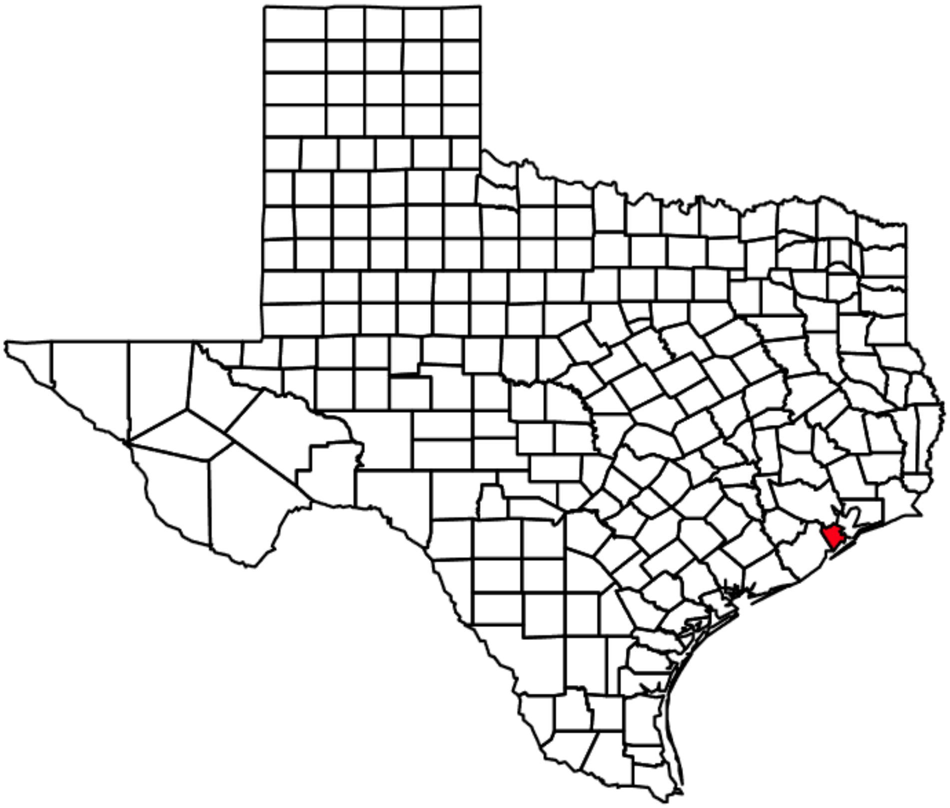
Section 1: Overview

Introduction

Planning Area

The City of Texas City is located along the south-east border of Texas and has a land area of 66.27 square miles.

Figure 1-1. City of Texas City Location Map



To be eligible for FEMA post-disaster mitigation funding, including Hazard Mitigation Grant Program funding, hazard mitigation plans must be updated every five years. Therefore, the City of Texas City has chosen to implement a Hazard Mitigation Plan in 2025.

Figure 1-2. Planning Area Map

Plan Participants

Representatives and staff members from the City of Texas City will form the Planning Team. For purposes of defining roles, stakeholders are individuals or groups that are vested in and affected by a mitigation action or policy. Examples of stakeholders include business owners, chamber of commerce, neighborhood associations, Red Cross, hospital districts, and private organizations. Public outreach also plays an important role in the Plan development. Stakeholders and the public were encouraged to participate in the development of the Plan. Section 2 includes a list of Planning Team members and activities and meetings held that involved the Planning Team and the public.

Hazard Mitigation Action Planning

The City of Texas City is susceptible to a wide range of natural hazards, including drought, hurricanes and tropical storms, floods, windstorms, extreme heat, lightning, tornadoes, hailstorms, expansive soils, dam and levee failure, wildfires, and winter storms. These life-threatening hazards can destroy property, disrupt the economy, and lower the overall quality of life for residents. The impacts of hazards can be lessened in terms of their effect on people and property through effective hazard mitigation action planning and implementation. This Plan provides an opportunity for the City of Texas City to evaluate successful mitigation actions and explore opportunities to reduce future disaster loss.

Scope

The focus of the mitigation plan is to reduce future losses within the City of Texas City by identifying mitigation strategies based on a detailed hazard risk analysis, including an assessment of both regional hazards and vulnerability. The mitigation strategies seek to identify potential loss-reduction opportunities. The goal of this effort is to work towards more disaster-resistant City.

The scope of the hazards considered herein are those associated with natural hazards. Other planning frameworks exist in the region for hazards not addressed here, including man-made hazards such as security concerns, critical infrastructure protection, hazardous materials responses, and medical and public health responses to terrorism. Agencies and organizations who may be contacted for further information on these topics include local emergency management agencies, Local Emergency Planning Committees (LEPCs), law enforcement agencies, fire departments, state and public health departments, local drinking water suppliers, local offices of the Texas Commission on Environmental Quality, and the Houston-Galveston Area Council.

Section 2: Planning Process

Plan Development

Mitigation planning involves bringing together community leaders to identify natural hazards threatening their community and define key actions to implement with the goal of achieving a more disaster-resistant community. This section provides an overview of the planning process, highlighting key steps as well as providing a detailed description of how stakeholders and the public were involved.

Planning Team

A Microsoft Teams virtual meeting was held on December 17, 2024, with the City of Texas City and Lockwood, Andrews and Newnam (LAN) to identify Planning Team members. The Planning Team identified Plan stakeholders, discussing options for engaging the public, and setting a project schedule.

Planning Team members included in Table 2-1 were asked to attend all workshops during the planning process. Some of the responsibilities of the Planning Team included: completing Capability Assessment Surveys, providing a public survey to the public, providing input regarding the identification of hazards, ranking hazards, identifying mitigation goals, developing new mitigation strategies, and identifying critical facilities.

Table 2-1. Planning Team

City	Position of Title	Department
City of Texas City	Manager and Homeland Security Director	Emergency Management
City of Texas City	Director, Community Development & Grant Administration	Community Development Department
City of Texas City	Assistant Emergency Manager	Emergency Management
City of Texas City	Public Works Director	Public Works Department
City of Texas City	Floodplain Manager	Engineering Department
City of Texas City	Engineering & Planning, City Engineer, Director	Engineering Department
City of Texas City	Fire Marshall	Fire Department

Planning Process

The process used to prepare this Plan includes following steps outlined in the Local Mitigation Planning Policy Guide. After the Planning Team was organized, a Capability Assessment Survey was developed and distributed at the Kick-Off Workshop on January 24, 2025. Both the Planning Team and the public ranked hazards. Specific mitigation strategies were discussed at the Mitigation Workshop on March 6, 2025. Finally, Plan Maintenance and implementation procedures were developed and are included in Section 18. A schedule of planning activities is included as Table 2-2.

Table 2-2. Schedule of Planning Tasks

Date	Service/Deliverable
1/24/2025	Conduct Kickoff Meeting, Capability Assessment; identify and evaluate hazards; begin drafting HMAP
3/6/2025	Conduct Risk Assessment Teams Virtual Workshop for Planning Team; begin drafting Risk Analysis; review upcoming Mitigation Strategy objectives, Conduct Mitigation Strategy Teams Workshop Planning Team, work with planning team to complete mitigation worksheets.

Date	Service/Deliverable
3/6/2025	Conduct public workshop by Virtual Teams Meeting and at the Moore Memorial Public Library. Reviewed Risk Analysis and strategy objectives with the public and other Stakeholders.
5/5/2025	Provide HMP Draft to Planning Team for review and comment.
5/14/2025	Planning Team met to review Draft HMP Plan and to provide comments.
5/22/2025	Posted outreach for Draft HMP to City Website & social media for two-week public comment period.
6/12/2025	Submit HMP Draft to TDEM for review and edits
TBD	FEMA Approval of PLAN; City of Texas City adopts Plan by resolution

Kickoff Workshop

The Planning Team Kickoff Workshop and Public Meetings were held virtually on January 24, 2025. The initial meeting provided an opportunity to inform officials and key department personnel about how the planning process pertained to their distinct roles and responsibilities, and also to involve stakeholder groups and the general public. In addition to the kickoff presentation, participants received the following information:

- Project overview regarding the planning process.
- Public Survey access information.
- Hazard Ranking form.
- Capability Assessment survey for completion.

A hazard ranking exercise was conducted at the Kickoff public meeting to get input from residents and rank natural hazards affecting the planning area. Participants ranked hazards in terms of level of risk, frequency of occurrence, and potential impact. Overall, residents ranked Hurricanes/Tropical Storms and Windstorms as the highest hazard risks followed by Floods, Extreme Heat, Severe Winter Storms, Lighting, Tornados, Dam/Levee Failure, Hailstorm, Coastal Erosion, Droughts, Land Subsidence, Expensive Soils, and Wildfires.

The Planning Team Kickoff Workshop was well attended. Efforts were made to document key participants. The following table highlights planning team participants for the City. For a comprehensive list of meeting attendees, meeting handouts, and documentation refer to Appendix A.

Table 2-3. Kickoff Workshop Participation Summary

Key Participants		Participation
Position or Title	Agency	
Manager and Homeland Security Director	Emergency Management, City of Texas City	✓ Present for Plan Overview ✓ Received Public Survey Access Information ✓ Participated in Hazard Ranking Exercise ✓ Received Capability Assessment
Assistance Emergency Manager	Emergency Management, City of Texas City	✓ Present for Plan Overview ✓ Received Public Survey Access Information ✓ Participated in Hazard Ranking Exercise ✓ Received Capability Assessment
Directory, Community Development & Grant Administration	Community Development, City of Texas City	✓ Present for Plan Overview ✓ Received Public Survey Access Information ✓ Participated in Hazard Ranking Exercise ✓ Received Capability Assessment
Public Works Director	Public Works Department, City of Texas City	✓ Present for Plan Overview ✓ Received Public Survey Access Information ✓ Participated in Hazard Ranking Exercise ✓ Received Capability Assessment
Floodplain Manager	Engineering, City of Texas City	✓ Present for Plan Overview ✓ Received Public Survey Access Information ✓ Participated in Hazard Ranking Exercise ✓ Received Capability Assessment
Engineering & Planning, City Engineer, Director	Engineering Department, City of Texas City	✓ Present for Plan Overview ✓ Received Public Survey Access Information ✓ Participated in Hazard Ranking Exercise ✓ Received Capability Assessment

Key Participants		Participation
Position or Title	Agency	
Fire Marshall	Fire Department City of Texas City	✓ Present for Plan Overview ✓ Received Public Survey Access Information ✓ Participated in Hazard Ranking Exercise ✓ Received Capability Assessment

Following the Plan Kickoff Workshop, the City of Texas City posted links to the public survey on its website and social media to solicit public outreach and input for the Plan.

Hazard Identification

Hazard identification and ranking was a major component of the Plan Kickoff Meeting. Following the Kickoff Meeting the Planning Team reviewed the public input received concerning the hazard ranking and formulated the final ranked list of natural hazards to be incorporated into the Plan. Hazards identification is documented in detail in Section 3 of this Plan.

Risk Assessment

A preliminary risk assessment for the City of Texas City Hazard Mitigation Action Plan was presented to Planning Team members via webinar on March 6, 2025. The resulting risk assessment profiled hazard events, provided information on previous occurrences, estimated probability of future events, and detailed the spatial extent and magnitude of impact on people and property. A hazard profile and vulnerability analysis for each of the natural hazards can be found in Sections 5 through 18 in this Plan.

Mitigation Review and Development

The mitigation strategy development for the Plan involved creating mitigation goals and new mitigation actions. Previous mitigation actions from the Texas City Multi-Hazard Mitigation Plan 2019 plan were reviewed as a baseline for new actions, goals, and objectives. The Planning Team reviewed their respective mitigation actions from the 2019 plan to determine projects that are still viable and may be included in the new City of Texas City Hazard Mitigation Action Plan.

An inclusive and structured process was used to develop and prioritize mitigation actions for this Plan, including the following steps:

Potential mitigation actions were developed, and the list narrowed down to those that were most likely to be implemented, most cost-effective in reducing risk, and most likely to receive political and community support.

A Problem Statement was developed for each hazard to determine actions to mitigate the specific problem or risk, background information on why the action is needed was documented as well as who (by title) will oversee implementation of the project. The timeframe for implementation was defined and any obstacles to implementation such as local environmental groups opposing the project or lack of community support was identified.

Participants were provided with an inventory of federal and state funding sources that could potentially assist in implementing the proposed mitigation actions. Planning Team Members considered benefits that would result from the mitigation actions versus the cost of those projects. The economic impact of implementing one action over another was a consideration.

Planning Team Members identified and prioritized proposed actions, costs and benefits, effects on existing buildings and future development, implementation schedules, and potential funding sources.

Table 2-4. Planning Team Meeting Attendance Summary

City	Kickoff & Public Meetings	Mitigation/Risk Assessment Strategy Workshops	Provide MAP Draft to Planning Team for Comments
Meeting Date	January 24, 2025	March 6, 2025	May 5, 2025
City of Texas City	X	X	X

X = Attended. Detailed attendance records are included in Appendix A.

C = Did not attend.

Resources and Existing Plans

Resources

A variety of resources were utilized in compiling the data needed to perform the hazard analysis. Resources included FEMA, the United States Army Corps of Engineers (USACE), Texas A&M Forest Service, National Oceanic and Atmospheric Administration (NOAA), the 2023 National Land Cover Database, the Texas Water Development Board (TWDB), the Texas Geographic Society, the Texas State Data Center, the Texas Division of Emergency Management (TDEM), the 2022 Census Bureau Population Estimate, the Galveston County Appraisal District, the USDA Galveston County Census of Agriculture, and local hazard event reports.

Review of the several plans, including the Comprehensive Master Plan, Stormwater Master Plan, Emergency Operations Plan, Capital Improvements Plan, and the Economic Development Plan provided essential data for developing actions to implement and incorporate into the mitigation plan.

Incorporation of Existing Plans

Current projects and studies were utilized as a starting point for discussing mitigation actions and how to incorporate the Plan into other local planning mechanisms such as budgetary, administrative, and development initiatives. Previous hazard events, occurrences, and hazard risk data were identified through NOAA's National Climatic Data Center (NCDC), Texas Geographic Society, U.S. Geographic Society, U.S. Department of Agricultural, local reporting, and other sources. The preliminary results were presented at the Risk Assessment webinar to facilitate a discussion to help participants develop actions for their city. Furthermore, these studies were used as a starting point for suggesting grant and mitigation activities based on local and FEMA's Hazard Mitigation Assistance (HMA) funding.

Public and Stakeholder Involvement

An important component of mitigation planning is public participation and stakeholder involvement. Input from individual citizens and the community as a whole provides the Planning Team with a greater understanding of local concerns and increases the likelihood of successfully implemented mitigation actions. If citizens and stakeholders are involved, they are more likely to gain a greater appreciation of the hazards present in their community and take steps to reduce their impact. Neighboring communities as well as local and regional stakeholders were invited and were provided with an overview of the planning process and how they may work with the City of Texas City to apply for future project funding to implement mitigation projects relative to their specific hazard risks. All stakeholders were invited by email.

Stakeholders

The following groups represent a partial list of organizations invited to provide input into the Plan.

Table 2-5. Plan Stakeholders

ENTITY	TITLE
City of Texas City	Manager and Homeland Security Director
City of Texas City	Community Development Director & Grants Administration
City of Texas City	Assistant Emergency Manager
City of Texas City	Public Works Director
City of Texas City	Floodplain Manager
City of Texas City	Engineering & Planning, City Engineer, Director
City of Texas City	Fire Marshall
Galveston County Recovers	Executive Director
Gulf Coast Center	Community, Public & Behavioral Health
Gulf Coast Transit District	Director
Galveston County Health District	Senior Environmental Investigator
Galveston County Food Bank	President & CEO
Texas City Independent School District	Director of Communications
Texas City Housing Authority	Executive Director
College of the Mainland Police	Lieutenant
Gulf Coast Water Authority	Deputy General Manager / Chief Operating Officer
Texas City La Marque Chamber of Commerce	President & CEO

Multiple non-profit organizations such as Galveston County Food Bank were invited to provide input to the plan. The food bank provides individuals and families that are economically disadvantaged or underserved populations with easy access to resources beyond food, connecting them to other agencies and services that can assist with needs such as childcare, job placement, family therapy, healthcare and other resources that can help get them back on their feet and on the path to recovery and/or self-sufficiency. Gulf Coast Center provides response and recovery to disasters or community crises, including emotional support, education, training and connectivity to resources.

Public Participation

Public involvement in the development of the plan included two public meetings prior to Plan approval and adoption. Public input was sought using three methods: open public meetings; public survey; and the draft Plan was made available for public review on the City of Texas City website, as well as other social media platforms. Public outreach for these opportunities is provided in Appendix A.

Public Participation Survey

In addition to the open public meetings, the City of Texas City Hazard Mitigation Action Plan participants were able to solicit input from citizens and stakeholders through the use of a Public Survey. The survey was designed to obtain data and information from the residents of the City of Texas City and surrounding areas. The City of Texas City solicited surveys through their website and social media. Links to the surveys were distributed by local officials and at public meetings. A total of 141 responses to the survey were completed which provided valuable input in the development of the Plan. A summary of the survey findings is provided in Appendix B.

Public feedback assisted in driving the direction of hazard profiling, developing mitigation actions for areas of concern expressed in the survey, and allowed the community to voice their concerns and involve those interested in the Hazard Mitigation Plan for the City of Texas City. Public feedback was also used in the cost-benefit analysis and prioritization of mitigation actions by factoring public opinion into the ranking criteria.

Section 3: Hazard Identification and Risk Assessment Overview

Hazard Identification

The purpose of this section is to provide background information for the hazard identification process, as well as descriptions for the natural hazards identified.

Upon a review of the full range of natural hazards suggested under FEMA planning guidance, the Planning Team identified twelve hazards that are to be addressed in the Plan. These hazards were identified utilizing input from Planning Team members, and a review of the current Texas State Hazard Mitigation Plan ("State Plan"). Readily available online information from reputable sources such as federal and state agencies was also evaluated to supplement information as needed. Based on this review, twelve hazards were identified as significant, as seen in Table 3-1.

Table 3-1. Hazard Descriptions

Hazard	Ranking	Description
Drought	1	Droughts can be classified as meteorological, hydrological, agricultural, or socioeconomic droughts. A meteorological drought is a reduction of precipitation from the expected average or typical precipitation patterns. A hydrologic drought occurs when below average rainfall impacts streams, lakes, reservoirs, and groundwater levels. Agricultural droughts are brought on by insufficient moisture in the soil, typically impacting crops. Socioeconomic droughts occur when water demand exceeds supply due to a precipitation-related supply shortfall. Droughts may initiate or exacerbate other hazards, such as extreme heat or wildfires.

Table 3-1. Hazard Descriptions

Hazard	Ranking	Description
Hurricanes/ Tropical Storms	2	Hurricanes and tropical storms are intense tropical weather systems that produce damaging winds, generate storm surge, and heavy rainfall.
Flood	3	A flood is the accumulation of water within a body of water, which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse susceptible to flooding. Flooding is the partial or complete inundation of otherwise normally dry land. Types of flooding include riverine, coastal, and shallow flooding.
Windstorms	4	A windstorm is a storm with high winds or violent gusts with little or no rain. The windstorm hazard excludes extreme wind events that occur with other wind-related natural hazards such as hurricanes, tropical storms, and tornados which are addressed elsewhere in this plan.
Extreme Heat	5	Extreme heat is the condition whereby temperatures hover ten degrees or more above the average high temperature in a region for an extended period. If extreme heat conditions persist, it may be considered a heat wave.
Lightning	6	Lightning is a sudden electrostatic discharge during an electrical storm between electrically charged regions of a cloud, between that cloud and another cloud, or between a cloud and the ground.

Table 3-1. Hazard Descriptions

Hazard	Ranking	Description
Tornado	7	A tornado is a violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. Tornadoes have wind speeds of 250 miles per hour or more. Damage paths can be more than one mile wide and fifty miles long.
Hailstorm	8	Hail is a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice. Nearly all severe thunderstorms produce hail aloft, though it may melt before reaching the ground. Multi-cell thunderstorms produce many hailstones, but not usually large hailstones. In the life cycle of the multi-cell thunderstorm, the mature stage is relatively short so there is not much time for growth of the hailstone. Supercell thunderstorms have sustained updrafts that support large hail formation by repeatedly lifting the hailstones into the very cold air at the top of the thunderstorm cloud. In general hail two inches (5 cm), a little larger than golf ball, or larger in diameter is associated with supercells. Non-supercell storms can produce golf ball size hail. In all cases, the hail falls when the thunderstorm's updraft can no longer support the weight of the ice. The stronger the updraft the larger the hailstone can grow[1].
Expansive Soils	9	Expansive soils contain minerals such as clay that are prone to large volume changes (swelling and shrinking). Soils with a high content of expansive minerals can shrink in drier seasons forming deep cracks. This shrinkage can remove support from buildings or other structures and result in damaging subsidence.

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[1] NOAA

Table 3-1. Hazard Descriptions

Hazard	Ranking	Description
Dam and Levee Failure	10	A dam is a barrier that is constructed to hold back water. A dam failure is a systematic failure of a dam structure resulting in the uncontrolled release of water, often resulting in floods that could exceed the 100-year flood plain boundaries. A levee is an embankment built to prevent overflow from a body of water. A levee failure is when a levee embankment fails, or is intentionally breached, causing the previously contained water to flood the land behind the levee.
Wildfire	11	A wildfire is an uncontrolled fire almost exclusively fueled by natural vegetative fuels. Fuel may come in the form of grass, brush, or tress. Wildfire risk increases with high concentrations of connected fuels. Meteorological conditions such as high temperatures, low humidity, droughts, and high wind can also increase wildfire risk. Humans are the most common source of initial ignition in wildfires. Sparks from agricultural, industrial, or automobile activity may start a wildfire.

Table 3-1. Hazard Descriptions

Hazard	Ranking	Description
Winter Storms	12	A severe winter storm event is defined as a storm with snow, ice, or freezing rain. Severe winter storms are rare for the Texas Coastal area. Sever winter storms may include snowstorms, blizzards, cold waves, and ice storms. Snowstorms include four or more inches of snow in a 12-hour period. Blizzards are characterized by low temperatures and strong winds in excess of 35 mph with large amounts of drifting snow. A cold wave is a winter cold front with a drastic drop in temperature. An ice storm occurs when rain falls out of the warm upper layers of the atmosphere into a cold and dry layer near the ground.[2]

Risk Assessment Overview

The risk assessment includes seven general parameters that are described for each hazard: description, location, extent, previous occurrences, future probability, vulnerability, and impacts.

Frequency of return, or probability, was calculated by dividing the number of events in the recorded period for each hazard by the overall time period that the resource database recorded events.

Applicable hazard profiles include a description of a general vulnerability assessment. Vulnerability is the total of assets that are subject to damages from a hazard (based on historic recorded damages). Assets in the region were inventoried and defined in hazard zones where appropriate.

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[2] Texas State Hazard Mitigation Plan Update 2023

Section 4: Vulnerability Assessment Overview

Vulnerable Assets Overview

Vulnerable assets are those that are susceptible to damage and loss from hazard events. A community's vulnerability to a natural hazard is measured as a function of that community's existing and future vulnerable assets including, but not limited to, populations, critical and non-critical infrastructure, property, and systems. Quantifying existing assets is the first step in defining a community's vulnerability to natural hazards. Existing assets are defined below for the City of Texas City.

Populations for the City of Texas City are included in the Existing Asset sections below. A description of the City of Texas City land cover is shown in Table 4-1.

While the City has experienced development and increased population growth since the last Hazard Mitigation Plan update, growth and development has not taken place in a way that changes vulnerability. The City's vulnerability remains unchanged.

Because vulnerability remains unchanged, community priorities also remain unchanged. Protection of population, industry, and public infrastructure remain key priorities for mitigation efforts.

Table 4-1. City of Texas City Land Cover[1]

Land Cover Type	Percent of Area
Barren Land	0.79%
Cultivated Crops	0.05%
Deciduous Forest	0.00%
Developed, High Intensity	2.66%
Developed, Low Intensity	5.90%
Developed, Medium Intensity	5.54%
Developed, Open Space	2.58%
Emergent Herbaceous Wetlands	5.33%
Evergreen Forest	0.10%
Hay/Pasture	9.85%
Herbaceous	0.30%
Mixed Forest	0.19%
Open Water	65.38%
Shrub/Scrub	0.02%
Unclassified	0.00%
Woody Wetlands	1.30%

Critical Facilities

For the purpose of hazard mitigation, FEMA defines critical facilities as hospitals, fire stations, police stations, courthouse, communications, and similar facilities where essential programs/services are provided. Other facilities such as public schools may be deemed by a community to be a critical facility as well. These facilities should be given special consideration when formulating regulatory alternatives and floodplain management plans. A critical facility should not be located in a floodplain if at all possible. If located in a floodplain it should be provided a higher level of protection so that it can continue to function and provide services during and after a flood. Hazard mitigation actions to mitigate risk to critical facilities located in the 100-year floodplain, or potentially impacted by future flood conditions, are included in this Plan in Section 19. Critical Facilities are tabulated in Appendix C of the Plan.

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[1] USDA Crop Land and National Land Cover Dataset, 2023

City of Texas City Existing Assets

<table>
<tr><th colspan="4">Population[2]</th></tr>
<tr><td colspan="4">53,084</td></tr>
<tr><th colspan="4">Critical Structure</th></tr>
<tr><th colspan="2">Type</th><th colspan="2">Quantity</th></tr>
<tr><td colspan="2">Roadways</td><td colspan="2">984.42 Miles</td></tr>
<tr><td colspan="2">Railroads</td><td colspan="2">45.40 Miles</td></tr>
<tr><td colspan="2">Crop Land</td><td colspan="2">11,819 Acres[3]; $438,411,673 Value[4]</td></tr>
<tr><th colspan="4">Non-Critical Facilities: Property[4]</th></tr>
<tr><th colspan="2">Residential</th><th colspan="2">Commercial</th></tr>
<tr><th>Parcels</th><th>Total Improvement Value</th><th>Parcels</th><th>Total Improvement Value</th></tr>
<tr><td>21,160</td><td>$3,479,490,151</td><td>1,592</td><td>$1,279,967,437</td></tr>
</table>

Vulnerable Future Assets

Future growth and development in the City of Texas City may affect hazard vulnerability. For identification of a community's future assets, it is useful to consider anticipated population growth, development trends, and planning and development management efforts. Based on population projections for the county planning area provided by the Texas Demographic Center[5], the county, overall, is expected to grow approximately 31% from 2020 to 2040. The City of Texas City experiences steady growth in development including trade and transportation, port activity, warehousing, and agricultural land.

Future assets are another important matrix to assess the planning area's vulnerability to natural hazards. With development comes the need to address the risk of natural hazards for larger populations and increased numbers of non-critical and critical facilities. Historically, hurricanes, tropical storms, and flooding have been a widespread problem for the Plan area; potential for these hazards creates limitations for urban land uses. A goal of community officials in the Plan area is to develop strategies to ensure that future development has reduced risk of impact by natural hazards while not inhibiting community growth. Vulnerability including potential dollar losses is defined for each hazard.

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[2] U.S. Census Bureau. "ACS Demographic and Housing Estimates." *American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP05*, 2022, https://data.census.gov/table/ACSDP5Y2022.DP05?q=texas city.

[3] 2023 Annual NLCD, Data | Multi-Resolution Land Characteristics (MRLC) Consortium

[4] Galveston County Appraisal District 2024 Parcels, GIS Data – Galveston Central Appraisal District

[5] Population Projections for Texas Counties, 2020-2040 and 2020-2060

Section 5: Drought

Drought Hazard Overview

Description

Droughts can be classified as meteorological, hydrological, agricultural, or socioeconomic droughts. A meteorological drought is a reduction of precipitation from the expected average or typical precipitation patterns. A hydrologic drought occurs when below average rainfall impacts streams, lakes, reservoirs, and groundwater levels. Agricultural droughts are brought on by insufficient moisture in the soil, typically impacting crops. Socioeconomic droughts occur when water demand exceeds supply due to a precipitation-related supply shortfall. Droughts may initiate or exacerbate other hazards, such as extreme heat or wildfires.

Location

The spatial extent of a drought tends to be relatively large, often stretching across multiple counties. Consequently, the entire City of Texas City is vulnerable to the impact of a drought. Crops and livestock are vulnerable to drought. The overwhelming majority of crop/pastureland is found in the northwestern portion of the city. Additional information about agricultural vulnerability can be found in the summary table.

Extent

The Palmer Hydrologic Drought Index is a value calculated monthly by NOAA. The PHDI takes the balance between environmental water supplies and demands. The index typically ranges between -6 to +6, as shown in Table 5-1. Negative numbers indicate a period of drought. Positive numbers indicate wet periods.

Table 5-1. Drought Extents (PHDI)

PHDI Value Range	Qualitative Drought Extent
0 - -0.5	Normal
-0.5 – -1.0	Incipient Drought
-1.0 – -2.0	Mild Drought
-2.0 – -3.0	Moderate Drought
-3.0 – -4.0	Severe Drought
< -4.0	Extreme Drought

The Texas A&M Forest Service (TFS) uses the Keetch-Byram Drought Index (KBDI), which is based on a daily water balance and is expressed in hundredths of an inch of soil moisture depletion. It is a closed system ranging from 0 to 800, where 0 represents a saturated soil, and 800 represents an absolutely dry soil. At any point along the scale, the KBDI value indicates the amount of precipitation it would take to bring the moisture level back to zero, or saturation. KBDI was developed to correlate the effects of drought on wildfire potential. This relationship is reflected in Table 5-2. The KBDI Index for the planning area may be viewed in Figure 1.

Table 5-2. Drought Extents (KBDI Index)

KBDI Value Range	Qualitative Drought Extent
0 – 200	Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity.
200 – 400	Fuels are beginning to dry and contribute to wildfire intensity. Heavier fuels will still not readily ignite and burn.
400 – 600	Lower litter and duff layers contribute to fire intensity and will burn actively. Wildfire intensity begins to increase significantly. Larger fuels could burn or smolder for several days.
600 – 800	Often associated with more severe drought with increased wildfire occurrence. Intense, deep-burning fires with extreme intensities can be expected. Live fuels can also be expected to burn actively at these levels.

Occurrences

Droughts in the City of Texas City can be long lasting, or short term. In the City of Texas City, the months of December, November, and January have the lowest average PHDI. PHDI values for the City of Texas City come from a NOAA North American Drought Monitoring station (USW00012918) located near the Houston Hobby Airport[1]. A summary of drought occurrences recorded by this monitoring station may be viewed in Table 5-3. A list of the average monthly PHDI values from 1937 to 2024 may be viewed in Table 5-4. These monthly average PHDI values were used for the occurrences, extent, and probability analyses present in City of Texas City Drought Hazard Table.

Table 5-3. Summary of the City of Texas City Drought Occurrences

Severity	Months on Record (1937 – 2024)	Percent of Total Time
Incipient Drought	87	8.3%
Mild Drought	253	24.0%
Moderate Drought	140	13.3%
Severe Drought	58	5.5%
Extreme Drought	15	1.4%
Total Months of Drought (PHDI <-0.5)	553	52.5%

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[1] https://www.ncei.noaa.gov/access/monitoring/nadm/indices/palmer/stn

Table 5-4. City of Texas City Historical PHDI Values (1937 – 2024)

Months of drought (PHDI <-0.5) indicated in red												
Year	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
1937	-0.18	-0.49	0.57	-0.55	-1.25	-1.48	-1.88	-1.92	-2.14	-1.85	-1.93	-1.33
1938	-1.11	-1.25	-1.64	-1.1	-0.67	-0.72	-0.56	-0.81	-0.99	-1.31	-1.4	-1.42
1939	-1.05	-1.07	-1.53	-1.64	-1.7	-1.79	-1	-1.07	-1.48	-1.86	-2.09	-2.43
1940	-2.91	-2.88	-2.9	-3.02	-3.29	-2.99	-3.01	-3.46	-3.35	-3.03	-1.61	-1.22
1941	-1.49	-1.41	1.59	2.11	1.95	2.24	2.42	2.19	3.1	3.65	3.11	2.51
1942	1.79	1.48	1.22	1.53	0.78	0.7	1.99	2.39	2.22	1.55	1.39	1.3
1943	1.25	0.63	0.98	-0.67	-0.83	-1.23	1.16	0.78	0.55	-0.84	1.68	1.88
1944	3.44	2.71	3.45	2.61	3.59	2.68	1.72	1.81	1.51	0.8	-1.32	-0.58
1945	-0.86	-0.96	-1.2	0.62	0.36	0.28	0.22	1.85	1.27	1.21	-0.98	0.89
1946	1.6	1.36	1.09	0.88	1.83	2.1	2.4	2.62	3.18	2.82	4.75	4.07
1947	3.91	3.12	2.97	2.37	2.89	2.08	1.39	1.98	1.04	-1.27	-1.05	-0.95
1948	0.44	0.66	-0.19	-0.49	-0.33	-0.59	-0.91	-1.25	-1.58	-1.94	-1.16	-1.66
1949	-1.18	-0.6	1.08	1.65	0.8	-1.16	0.66	-0.03	-0.81	2.68	1.69	2.95
1950	2.71	2.78	2.15	2.32	1.65	1.62	1.32	-1.01	-1.68	-2.15	-2.6	-3.15
1951	-2.74	-2.92	-2.2	-2.35	-2.31	-2.46	-2.94	-3.31	-3.03	-3.27	-3.47	-3.63
1952	-4.39	-3.22	-2.97	-1.96	-1.85	-1.91	-1.73	-2.22	-2.52	-2.84	-2.06	-1.36
1953	-1.73	-1.48	-2.24	-2.49	-1.75	-1.93	-2.23	-1.35	-2.14	-2.24	-1.8	-0.71
1954	-1.13	-1.87	-2.19	-2.19	-2.24	-2.69	-2.6	-2.6	-3.37	-2.71	-2.85	-3.21
1955	-2.53	-1.55	-1.94	-1.79	-1.83	-2.2	-2.58	-1.38	-1.19	-1.7	-2.17	-2.61
1956	-2.48	-2.51	-2.77	-2.78	-2.81	-2.82	-3.38	-3.99	-4.34	-4.24	-4.38	-3.86
1957	-4.34	-4.32	-1.76	-0.56	-1	-1.18	-1.84	-2.06	-1.25	1.78	2.26	1.6
1958	1.8	1.83	1.43	1.12	0.58	-1.47	-1.35	-1.64	1.81	1.16	0.55	-1.45
1959	-1.48	2.03	1.57	2.42	2.46	1.82	2.55	3.29	3.01	2.78	2.28	2.51
1960	1.95	2.05	1.36	0.79	-1.43	1.03	0.73	1.25	-0.82	0.35	0.23	1.58
1961	1.73	1.7	1.14	0.85	-0.68	0.68	1.8	1.87	2.28	1.27	2.47	2.16
1962	1.6	0.64	-1.46	-0.99	-1.49	-1.16	-1.79	-2.12	-2.29	-2.37	-1.86	-1.42
1963	-1.27	-1.21	-1.74	-2.29	-2.97	-2.6	-2.93	-3.29	-3.7	-4.08	-3.48	-2.77
1964	-2.58	-1.75	-1.65	-1.88	-2.12	-2.49	-2.94	-3.17	-2.63	-2.62	-2.44	-1.81
1965	-2.05	-1.78	-2	-2.45	-1.97	-2.2	-2.64	-2.93	-3.09	-2.96	-2.8	-2.1
1966	-1.55	1.84	1.53	2.31	3.33	2.86	2.13	2.32	1.82	1.79	1.02	-1.23

Table 5-4. City of Texas City Historical PHDI Values (1937 – 2024) (cont.)

Months of drought (PHDI <-0.5) indicated in red												
Year	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
1967	-1.57	-1.67	-1.95	-1.76	-1.96	-2.6	-2	-2.39	-2.22	-2.19	-2.86	-2.44
1968	-1.21	-1.28	-1.01	-1.04	2.17	2.7	2.99	2.67	2.21	1.79	1.35	0.55
1969	-1.44	-0.8	0.72	0.61	0.62	-0.49	-0.68	-1.12	-1.35	-1.31	-1.75	-1.51
1970	-1.63	-1.51	-0.63	-0.78	2.4	1.62	1.19	0.58	1.27	1.7	1.22	-1.17
1971	-2	-2.29	-2.52	-2.59	-2.8	-3.15	-3.26	-2.51	-1.89	-2.17	-2.39	-1.93
1972	-1.77	-1.91	-2.31	-1.45	-0.7	-0.59	1.36	0.97	1.12	-0.49	0.94	0.32
1973	0.62	0.69	0.97	2.47	2.08	3.07	3.81	3.67	4.19	4.8	3.46	2.98
1974	2.92	2.15	2.19	1.78	2.16	1.48	1.36	2.03	1.86	1.79	2.32	2
1975	1.71	0.98	0.75	0.94	1.3	1.76	1.49	2	1.08	1.19	0.57	-1.27
1976	-1.53	-2.18	-1.93	-1.72	-1.54	1.39	2.49	2.4	2.68	2.49	3.06	3.85
1977	3.62	3.17	2.89	2.96	2.18	1.64	1.21	0.75	-1.26	-1.68	-1.1	-1.5
1978	1.22	1.27	0.75	-0.86	-1.2	-1.32	-1.63	-1.93	-1.28	-1.86	-1.02	-1.18
1979	0.92	1.25	2.44	2.7	2.61	2.51	4.71	4.73	6.31	5.74	4.81	4.09
1980	4.6	3.84	3.91	3.34	3	2.15	1.32	-1.93	-1.48	-1.71	-1.75	-2.11
1981	-2.01	-1.77	-1.87	-2.13	-0.69	2.4	3.17	5.33	4.42	5.1	4.35	3.73
1982	3.05	2.92	2.46	2.27	2.46	2.29	1.72	1.52	0.64	-1.35	-0.68	0.75
1983	0.51	1.21	1.46	0.73	0.87	0.6	1.09	1.74	2.41	1.93	1.56	1.56
1984	1.62	1.48	1.08	-0.91	-1.17	-1.59	-1.54	-0.85	-0.67	1.35	1.06	0.71
1985	-0.56	1.01	1.46	0.7	-1.22	-1.37	-1.55	-1.9	-1.85	-1.67	-1.03	-1.09
1986	-1.6	-1.65	-1.9	-2.26	-2.22	-1.51	-1.95	-1.66	-1.59	-1.2	1.29	1.97
1987	1.65	1.79	1.06	-1.19	-0.91	0.55	1.41	1.29	0.59	-1.07	-1.21	-1.3
1988	-1.76	-2.22	-1.47	-1.54	-2.07	-2.36	-2.42	-2.96	-2.95	-2.92	-3.45	-3.94
1989	-3.34	-3.62	-3.51	-3.59	-3.06	-1.22	-1.27	2.28	1.35	0.99	-1.16	-1.72
1990	-1.47	-1.22	-0.71	0.67	-0.17	-0.73	-1.25	-1.82	-1.83	-1.87	-2.06	-2.22
1991	-0.67	1.78	1.27	2.47	2.89	3.28	2.72	1.98	2.36	1.7	1.56	2.13
1992	2.85	3.53	3.42	3.33	3.67	3.27	3.09	2.65	2.21	1.46	2.49	2.29
1993	2.83	2.32	2.85	3.01	2.82	2.96	2.69	1.85	0.84	1.83	2.46	1.91
1994	1.52	0.85	-1.11	-0.85	0.74	0.83	-0.53	-0.68	-1.27	2.23	1.23	2.26
1995	2.68	2.24	2.75	2.46	2.7	2.2	1.97	1.32	0.93	-1.02	-0.91	0.59
1996	-0.38	-0.9	-1.33	-1.56	-2.37	-1.85	-2.5	-1.59	-1.07	-1.39	-1.83	-2.03

Table 5-4. City of Texas City Historical PHDI Values (1937 – 2024) (cont.)

Months of drought (PHDI <-0.5) indicated in red												
Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1997	-1.2	1.44	2.02	3.13	3.61	3.33	2.82	2.03	2.46	3.04	2.51	3.2
1998	3.71	3.67	3.3	2.4	1.07	-2.16	-2.69	-2.66	-1.44	-0.71	2.01	1.9
1999	1.78	0.91	0.89	-1.16	-0.82	-0.65	-0.64	-1.31	-1.97	-2.37	-2.83	-2.7
2000	-3.08	-3.46	-3.79	-3.27	-2.77	-3	-3.39	-3.68	-3.46	-2.97	-1.45	-1.39
2001	-0.92	-1.59	1.38	-0.73	-1.01	2.21	1.92	3.22	3.77	3.56	3.57	4.1
2002	3.29	2.53	2.44	2.49	2.27	1.78	2.33	3.01	2.53	3.01	2.61	2.67
2003	2.05	1.78	1.22	0.68	-2.01	-1.85	-1.68	-1.46	-0.66	-0.68	-0.88	-0.91
2004	-0.74	0.82	0.1	0.08	0.42	0.92	0.8	0.84	-0.53	-0.94	1.18	0.67
2005	-1.04	-0.75	0.37	-0.52	-0.95	-1.72	1.19	0.9	-0.98	-1.42	-1.71	-2.02
2006	-2.57	-2.82	-3.2	-3.38	-2.96	-2.07	-1.07	-0.97	-1.23	2.8	1.92	1.78
2007	2.43	1.74	2.95	2.99	3.61	3.22	4.03	4.42	4.27	3.25	2.95	2.09
2008	2.63	2.42	2.13	1.54	0.57	0.63	-1.09	0.62	1.66	1.1	1.22	-0.76
2009	-1.47	-1.97	-1.93	2.6	1.53	0.6	-1.82	-2.39	-2.24	-0.97	-1.24	1.43
2010	1.07	1.13	0.9	-0.63	-1.26	-1.42	1.25	0.79	0.89	-0.86	-0.71	-0.19
2011	0	-0.71	-1.38	-2.21	-3.08	-3.58	-3.78	-4.36	-4.78	-4.18	-4.09	-3.65
2012	-2.98	-1.87	-1.37	-1.66	-1.08	-1.4	-0.67	-0.81	-0.98	-1.47	-2.15	-1.74
2013	-1.8	-2.09	-2.28	-0.67	-0.85	-1.42	-2.05	-2.61	-2.4	-1.4	-1.21	-1.66
2014	-2.15	-2.19	-1.95	-2.2	-0.86	-1.13	-1.61	-1.81	-1.81	-2.01	-1.76	-1.49
2015	-0.87	-1.33	0.9	1.71	3.32	2.86	2.28	3.14	2.75	3.62	3.06	2.6
2016	2.11	1.41	1.43	2.4	2.7	2.83	2.86	3.45	2.6	1.62	0.89	-1.71
2017	-1.73	-2.13	-0.8	-0.89	-1.15	-1.18	-1.43	6.37	5.55	4.52	3.3	3.13
2018	2.85	2.58	1.92	1.63	1.18	0.73	1.12	-1.26	-0.69	0.67	0.28	0.88
2019	0.96	-0.05	-0.64	-0.87	1.09	1.18	-0.55	0.32	1.26	0.95	0.56	-1.12
2020	-0.79	-1.01	-1.86	-1.96	-1.31	-1.39	-0.8	-0.92	1.67	0.8	0.64	1.62
2021	0.97	0.61	-1.08	-1.25	0.98	0.9	1.41	1.34	1.61	0.97	-0.88	-1.75
2022	-1.91	-2.29	-2.26	-2.57	-2.88	-3.54	-4.02	-3.81	-4.31	-4.18	-3.21	-3.2
2023	-2.9	-3.36	-3.6	-3.17	-2.84	-2.93	-3.15	-3.93	-4.16	-3.47	-3.08	-3.08
2024	-1.52	-1.86	-1.9	-1.85	-0.94	-1.24	1.59	1.15	-1.04	-1.54		

Probability

Probability, or frequency of return, was calculated by dividing the number of months of drought in the recorded time period by the overall time period that the resource database has recorded. A drought may cover several parts of the city; however, a drought event is recorded for the entire city based on the levels of severity and the length in time of each occurrence. Table 5-5 provides a general overview of drought severity, probability, and return interval. Probabilities for future drought events are defined for the entire city in the following sections.

Table 5-5. City of Texas City Drought Probability

Drought Extent	Estimated Annual Probability	Estimated Return Interval
Incipient Drought	8.3%	1 year
Mild Drought	24.0%	0.35 years
Moderate Drought	13.3%	0.63 years
Severe Drought	5.5%	1.52 years
Extreme Drought	1.4%	5.95 years

Probabilities of future drought events are also subject to the effect of future conditions, such as climate change. The effects of climate change include sea level rise, changes in weather patterns like drought and flooding, and much more. As long-term weather patterns and average temperatures change so too will the locations, frequencies, and range of anticipated intensities of droughts. In many parts of the United States and the world, climate change increases the odds of worsening drought. Regions such as the U.S. Southwest, where droughts are expected to get more frequent, intense, and longer lasting, are at particular risk. The impacts of drought will be increasingly severe as Texas City's population grows and climate change leads to longer, more frequent droughts. Urban development will increase water demand, compounding the effects of drought on both public services and the economy. The need for enhanced water management systems, including improved infrastructure for water recycling and conservation, will grow as these pressures increase.

Impact

Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality. There is very low risk of loss of life or damage to structures associated with drought. Droughts may cause water shortages and require regulators to enact water rationing. The impacts of drought tend to be felt most by agriculture and related industries. Droughts can damage crops and pastoral lands and in severe cases, droughts may kill trees and cause loss of livestock. Dead vegetation from drought can serve as fuel for wildfires.

Crop insurance is purchased by agricultural producers such as farmers and ranchers to protect their investment in the event of natural disaster like drought, hail, or flood. The extent of crop loss due to drought occurrences is difficult to quantify because a drought during a growing season can impact the next two years of crop production. Documentation of agricultural losses due to drought is typically filed by the landowner directly with the policy holder and is not a matter of public record. For this reason, historical crop damages caused by drought is not quantified herein.

Economic impacts of droughts may be complex and far ranging. Water is required to produce many goods and services. If impacts are felt in basal levels of supply chains, there is potential for measurable downstream effects. The impacts of a drought may be felt by many interconnected industries and may reach well beyond the temporal or spatial extents of the drought.

An example of these economic impacts may be demonstrated by the 2011 Texas Drought, which had a total direct cost of agricultural loss estimated at $5.2 billion with an estimated $3.5 billion in indirect cost for a total of $8.7 billion in losses statewide. Some of this cost is associated to the decreased park attendance, demanding $4.6 million just to keep parks open to the public[2].

Vulnerability

Communities with a greater proportion of crop area may be more vulnerable to the economic impacts of drought. Cropland was calculated by using the 2023 USDA Crop Land and National Land Cover Dataset. This data is the most recent data of its type.

Droughts may potentiate the effects of other hazards. For example, droughts may remove water from vegetation, rendering areas more vulnerable to wildfires. Wildfire hazards are discussed elsewhere in this plan.

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[2] Testimony at TWDB Work Session Meeting (October 21, 2014)

City of Texas City Drought Hazard

LOCATION
City Wide

OCCURRENCE	EXTENT				
Months of Drought (PHDI <-0.5) 1937-2024	Magnitude (PHDI Description)				
	Months of Incipient Drought	Months of Mild Drought	Months of Moderate Drought	Months of Severe Drought	Months of Extreme Drought
553	87	253	140	58	15

PROBABILITY					
Annual Chance of Drought (PHDI <-0.5)	Magnitude (PHDI Description)				
	Annual Chance of Incipient Drought	Annual Chance of Mild Drought	Annual Chance of Moderate Drought	Annual Chance of Severe Drought	Annual Chance of Extreme Drought
52.5%	8.3%	24.0%	13.3%	5.5%	1.4%

IMPACT
Crop and Pasture Damage
Values of historical crop and pasture damages caused by drought are not available in the public domain by jurisdiction as confirmed by AgriLife and USDA Webb County Farm Service Agency.

VULNERABILITY	
Crop and Pastureland	
Acres[3]	Percent of Total Jurisdictional Area
11,819	9.90%

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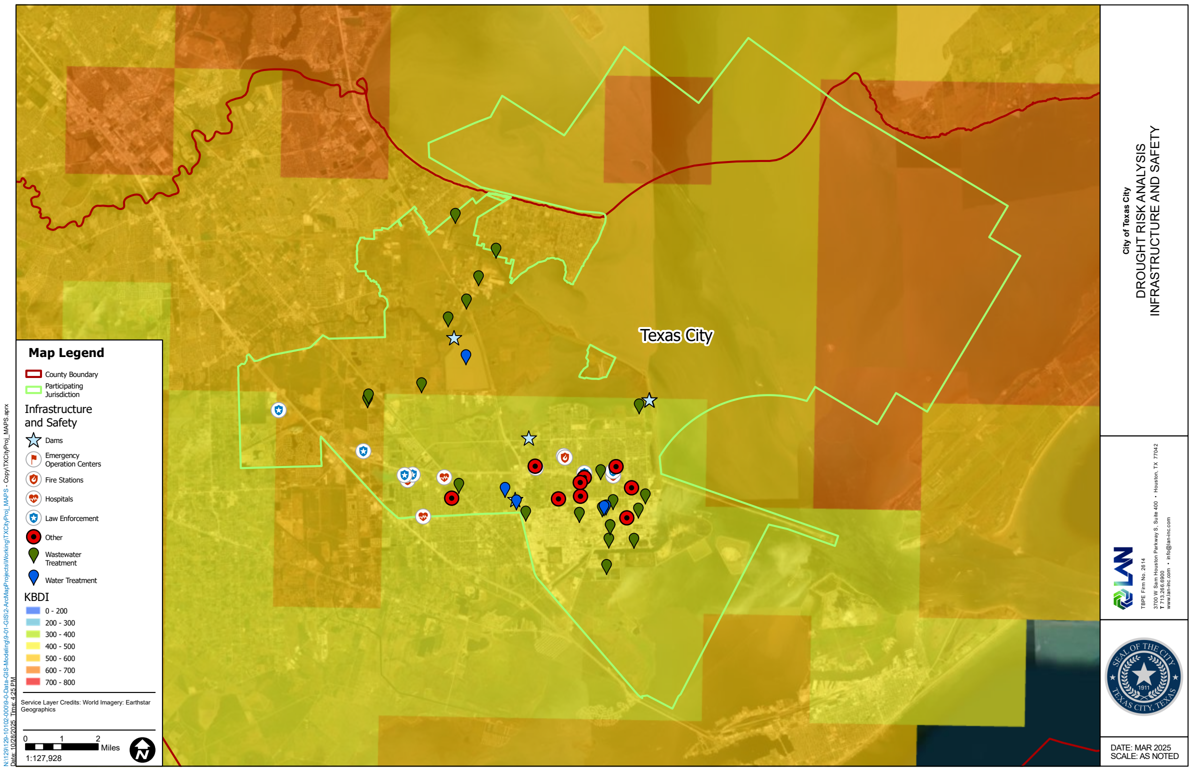
[3] 2023 Annual NLCD, Data | Multi-Resolution Land Characteristics (MRLC) Consortium

Figure 5-1. City of Texas City Drought Hazard Map (Infrastructure and Safety)[4]



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[4] Texas A&M Forest Service (TFS), estimated Mar. 25th, 2025

Figure 5-2. City of Texas City Drought Hazard Map (Education)[5]

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[5] Texas A&M Forest Service (TFS), estimated Mar. 25th, 2025

Figure 5-3. City of Texas City Drought Hazard Map (Care Centers)[6]

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[6] Texas A&M Forest Service (TFS), estimated Mar. 25th, 2025

Section 6: Hurricane and Tropical Storms

Hurricane and Tropical Storms Hazard Overview

Description

Hurricanes and tropical storms are intense tropical weather systems that produce damaging winds, generate storm surge, and heavy rainfall.

Location

Hurricanes and tropical storms do not have a specific geographic boundary and can occur throughout the planning area uniformly. According to FEMA Wind Zones in the United States as shown in Figure 6-1, the entirety of the City of Texas City is identified as a Hurricane-Susceptible Region and is in Wind Zone III, associated with winds as high as 200 mph.

The effects of a hurricane can be felt as far as 150 miles from the center of the storm. The most damaging effects of a storm, both in terms of wind damage and storm surge, are likely to be felt within the radius of maximum wind (RMW). Hurricanes are considered to have made a direct strike when an area passes within the RMW. The average RMW of Atlantic hurricanes has been observed to be about 30 miles[1]. A 30-mile buffer applied to the storms that have occurred in the planning area encompasses the entire planning area. Consequently, the entire planning area should be considered at risk of hurricane or tropical storm damage.

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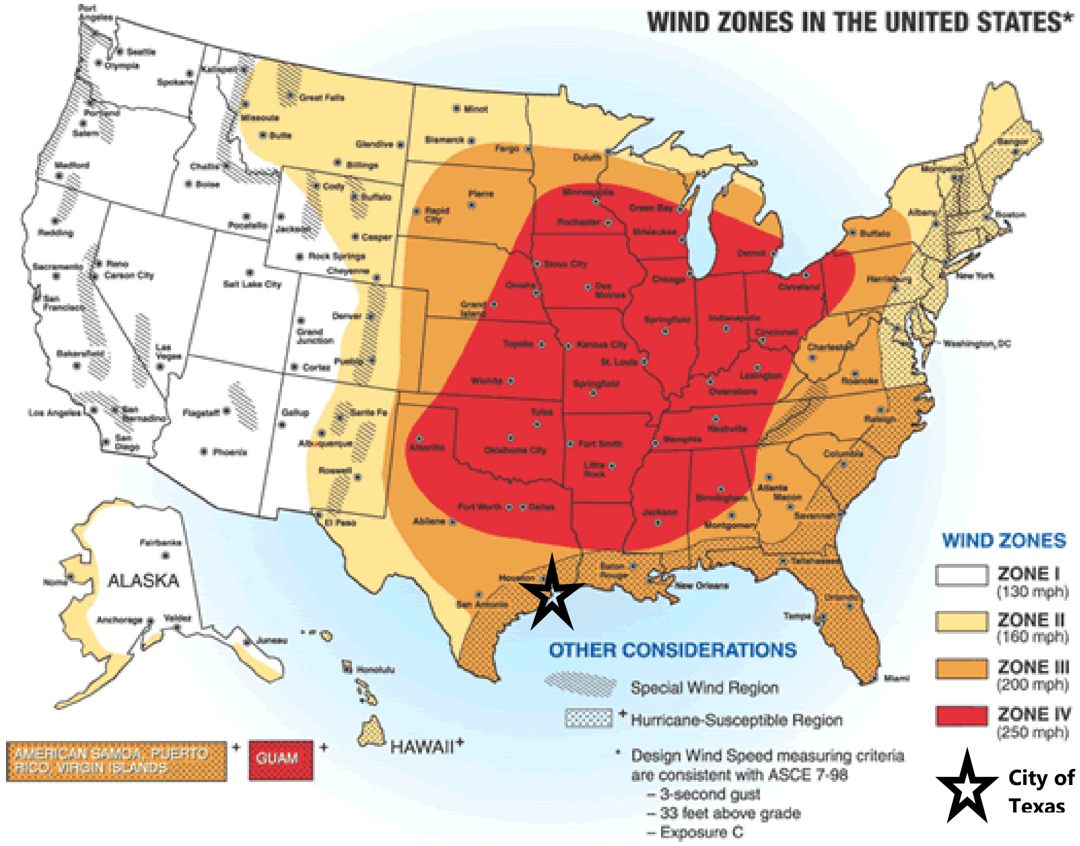
[1] Source: A Note on the Radius of Maximum Wind for Hurricanes, S.A. Hsu and Zhondge Yan, 1998

Figure 6-1. FEMA Wind Zones in the United States



Extent

Hurricane intensity is categorized by the Saffir-Simpson Scale, ranked 1 – 5, in order of lowest to highest wind speed. This scale, while it is based on a limited suite of characteristics of hurricane intensity, provides an informative framework with which hurricanes can be discussed. Category 3, 4, and 5 storms are the most dangerous hurricanes. There is a significant potential for property damage and loss of life associated with Category 3-5 storms. Only 20% of tropical hurricane landfalls are from Category 3-5 storms, yet Category 3-5 storms have caused 70% of hurricane-related damage in the United States. Category 1 and 2 storms, while generally not as dangerous as Category 3-5 storms, still require consideration and preparation. For example, Hurricane Ike was a Category 2 storm, yet was the third most destructive hurricane to make landfall in the United States. Table 6-1 describes Saffir-Simpson Scale hurricane categories and associated maximum wind speeds.

Historically, hurricanes and tropical storms have regularly passed within 30 miles of the planning area, as shown in Figure 6-2 through 6-5. Given the planning area's distance from the coast, it is anticipated that a Category 5 Hurricane will impact the planning area in the future even though there has been no recorded occurrence of a Category 5 hurricane within 30 miles of the planning area.

Table 6-1. Saffir-Simpson Hurricane Wind Scale[2]

Category	Maximum Sustained Wind Speed (MPH)
1	74-95
2	96-110
3	111-129
4	130-156
5	157+

Occurrences

The typical Atlantic hurricane season runs from June to October. Most storms occur within this range. Between 1854 and 2024, a total of 42 unique storms crossed within 30 miles of the planning area. A detailed breakdown of storms by intensity is presented in Table 6-2. More than half of the storms that crossed within 30 miles of the planning area during this time were below Category 1, but it is important to note that tropical storms and depressions can also have devastating impacts.

Table 6-2. Historical Occurrences[3]

Hurricanes and Tropical Storms Within 30 Miles of Planning Area (1854 – 2024)						
Total Storms	Tropical Storms & Depressions	Category 1 Hurricanes	Category 2 Hurricanes	Category 3 Hurricanes	Category 4 Hurricanes	Category 5 Hurricanes
42	25	8	5	1	3	0

Probability

The annual probability and reoccurrence intervals of tropical storms and hurricanes is presented in Table 6-3. Probability and reoccurrence intervals are calculated by dividing the number of events by the observation period. It should be noted that these probabilities reflect the previous

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[2] Landsea, C.W., Pielke, R.A. Jr., Mestas-Nunez, A.M., Knaff, J.A. (1999)
Atlantic Basin Hurricanes: Indices of Climatic Changes. *Climactic Change*, 42:89-129.

[3] NOAA

occurrence of the center of a storm tracking within 30 miles of the planning area. This is because the effects of a hurricane can be felt as far as 150 miles from the center of the storm. and the most damaging effects of a storm, in terms of wind damage, are likely to be felt within the radius of 30 miles. A 30-mile buffer applied to the storms that have occurred in the planning area encompasses the entire planning area. Consequently, the entire planning area should experience the same risk probability and recurrence intervals. Although a Category 5 storm has not passed within 30 miles of the City of Texas City in the recorded history of storms available, the occurrence is not entirely out of the question. Therefore, the annual probability of a Category 5 storm passing within 30 miles of the City of Texas City has been assigned as 0.5%.

Table 6-3. Reoccurrence Probability

Annual Probability of Storms Within 30 Miles of Planning Area						
Future Storms	Tropical Storms & Depressions	Category 1 Hurricanes	Category 2 Hurricanes	Category 3 Hurricanes	Category 4 Hurricanes	Category 5 Hurricanes
24.7%	14.7%	4.7%	2.9%	0.6%	1.8%	0.5%

Probabilities of future hurricane and tropical storm events are also subject to the effect of future conditions, such as climate change. The effects of climate change include sea level rise, changes in weather patterns like drought and flooding, and much more. As long-term weather patterns, average temperatures, and sea levels change, so too will the locations, frequencies, and range of anticipated intensities of hurricanes and tropical storms. Climate change worsens hurricane impacts in the United States by increasing the intensity and decreasing the speed at which they travel. There is uncertainty as to whether there will be an effect on the number of hurricanes, but the intensity and severity of hurricanes will continue to increase as the climate changes. The City of Texas City is particularly vulnerable due to its proximity to the coast. Climate change is projected to increase the intensity of these storms, resulting in heavier rainfall over shorter periods. This will overwhelm stormwater drainage systems and lead to more frequent flash flooding, particularly in low-lying and newly developed areas. As the city's population and urban footprint expand, more people and infrastructure will be exposed to flood risks, requiring improvements in flood management infrastructure, including levees, storm drains, and water retention systems.

Impact

The City of Texas City is surrounded by Galveston Bay and is less than 10 miles away from the Gulf of Mexico; the entire planning area will be vulnerable due to the proximity to impacts of wind brought on by hurricanes and tropical storms. Texas City is at risk for hurricanes and tropical storms, and is close enough to the coast to be susceptible to storm surge hazards.

Additionally, hurricanes and tropical storms produce large amounts of rain. This rain can overwhelm drainage systems. Even hurricanes or tropical storms that have weakened after making landfall can continue to drop significant quantities of water. This water can lead to flooding.

The impacts to communities from a Category 5 storm could be near complete destruction of all assets. Houses and commercial property could be destroyed. In addition to the destruction of property, populations can be displaced if their homes are destroyed. Power and other utilities can be interrupted, even by lower category storms. Crops can be severely damaged, resulting in economic impacts.

Vulnerability

The City of Texas City is located close enough to the Texas coast that all assets are at risk from hurricanes and tropical storms. The Gulf Coast often generates powerful hurricanes and tropical storms, particularly Category 4 and 5 storms. It is important to note all assets within the planning area are close enough to the coast that vulnerability to damage from hurricanes and tropical storms are high. These assets are summarized in the Impact & Vulnerability table.

City of Texas City Hurricane and Tropical Storms Hazard

LOCATION
Area at Risk
City Wide

OCCURRENCE	EXTENT					
Total Storms	Tropical Storms & Depressions	Category 1 Hurricanes	Category 2 Hurricanes	Category 3 Hurricanes	Category 4 Hurricanes	Category 5 Hurricanes
42	25	8	5	1	3	0

PROBABILITY						
Future Storms	Tropical Storms & Depressions	Category 1 Hurricanes	Category 2 Hurricanes	Category 3 Hurricanes	Category 4 Hurricanes	Category 5 Hurricanes
24.7%	14.7%	4.7%	2.9%	0.6%	1.8%	0.5%

IMPACT & VULNERABILITY	
Total Population[4]	**Land Area (Acres)**[5]
53,084	41,328.26
Residential Parcels[6]	**Residential Total Improvement Value**
21,160	$3,479,490,151
Commercial Parcels	**Commercial Total Improvement Value**
1,592	$1,279,967,437
Industrial Parcels	**Industrial Total Improvement Value**
172	$8,434,100,320
Crop Area (Acres)	**Crop Value**
11,819	$438,411,673
Roadway (Miles)	**Railroad (Miles)**
984.42	45.40

Historical occurrences can provide insight into potential future impacts. Due to the varying characteristics of hurricane wind and storm surge and location of the storm during landfall, the impact of future storms may differ dramatically than historical storms of similar magnitude.

Hurricane Carla made landfall in Texas in 1961 as a Category 4 storm. Across the state of Texas, 43 people died and $325.7 million in damages were experienced. Texas City experienced a storm surge of about 10 feet. Hurricane Alicia made land fall in the Houston-Galveston region in 1983 as a Category 3 storm. Across the state, the storm caused $3 billion in damage and the deaths of 21 people. The City of Texas City was largely protected by the levee system. Hurricane Ike made landfall on nearby Galveston island as a Category 2 storm in 2008. Across the state, the storm caused 84 fatalities and $30 billion in damages. The Texas City Dike was overtopped by the storm and damaged. In 2017, Hurricane Harvey made landfall as a Category 4 storm near Rockport, TX. The storm is tied with Hurricane Katrina as the costliest storm on record with $125 billion in damages and 107 deaths.

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[4] U.S. Census Bureau. "ACS Demographic and Housing Estimates." *American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP05*, 2022, https://data.census.gov/table/ACSDP5Y2022.DP05?q=texas city. Accessed on December 4, 2024.

[5] 2023 Annual NLCD, Data | Multi-Resolution Land Characteristics (MRLC) Consortium

[6] Galveston County Appraisal District 2024 Parcels, GIS Data – Galveston Central Appraisal District

Figure 6-2. Map of Hurricane & Tropical Storms for The City of Texas City (1854 – 2024)

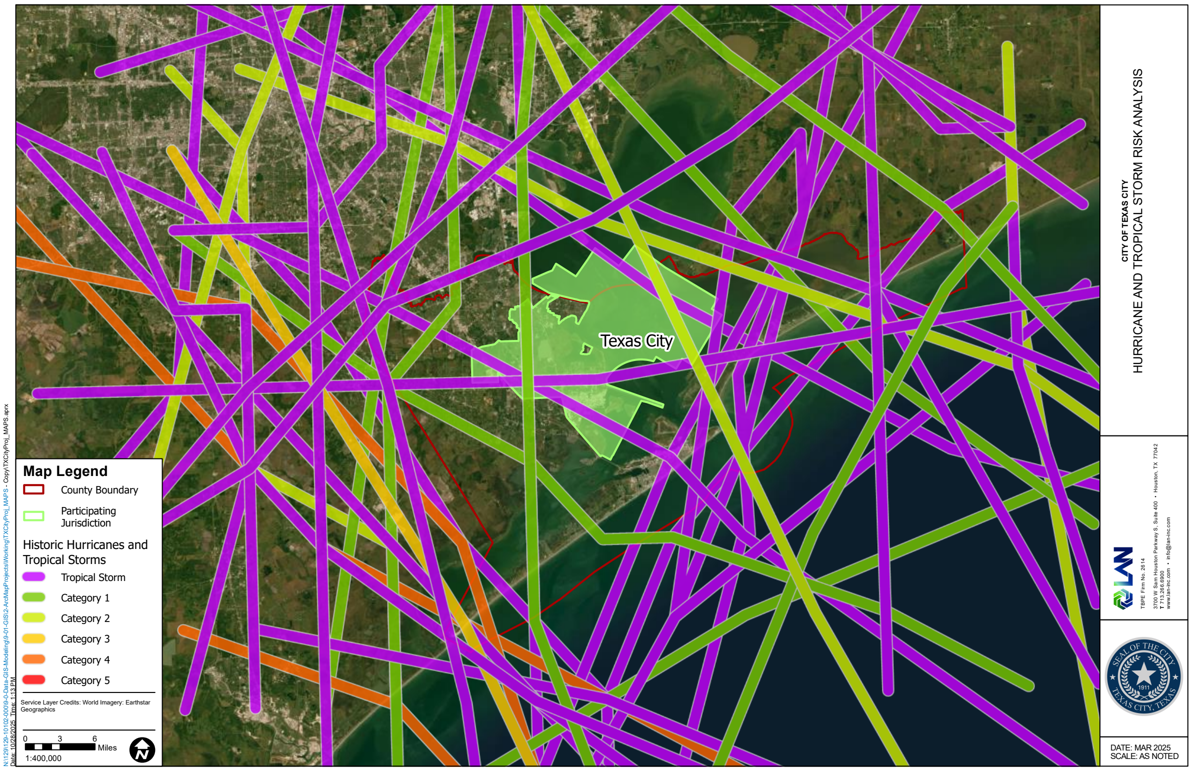

Figure 6-3. Map of Hurricane & Tropical Storms for The City of Texas City (1854 – 2024) (Infrastructure and Safety)

Figure 6-4. Map of Hurricane & Tropical Storms for The City of Texas City (1854 – 2024) (Education)

Figure 6-5. Map of Hurricane & Tropical Storms for The City of Texas City (1854 – 2024) (Care Centers)

Section 7: Flood

Flood Hazard Overview

Description

A flood is the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse susceptible to flooding. Flooding is the partial or complete inundation of otherwise normally dry land. Types of flooding include riverine, coastal, and shallow flooding.

Location

Sources of flooding in the City of Texas City include riverine flooding, coastal flooding, and flooding resulting from poor drainage, otherwise referred to as localized flooding. Federal Emergency Management Agency (FEMA) flood maps are the number one resource for defining location of flood hazard for a community. The current effective FEMA Flood Insurance Rate Maps (FIRMS) and Flood Insurance Study (FIS) for the City of Texas City are from 2019.

Adoption of flood maps in conjunction with development of a new city-wide Hazard Mitigation Plan provides the City of Texas City an opportunity to coordinate and implement these two planning mechanisms into land use policies, regulations, and ordinances, and to alter the built environment to build resiliency to natural hazards over time. Communities may also consider higher regulatory standards to be more aligned with the city's regulations, and to more effectively, and responsibly, manage the local National Flood Insurance Program (NFIP).

This report section includes floodplain maps with the 2019 FEMA Flood Insurance Rate Maps (FIRMs) floodplain extents which incorporate the hydrologic and hydraulic analysis of the area. This floodplain map may be seen in Figure 7-1.

Extent

Magnitude of flood hazards is expressed in term of the 100-yr storm maximum flood depth experienced by the planning area. The maximum flood depth was found through the effective flood hazard data in the area. The highest static base flood elevation in the City of Texas City is 3 feet. Generally, homes that are impacted by more than four feet of flood depth are considered by

FEMA as a complete loss. Therefore, flood depth combined with number of homes impacted by floods is one measure of a community's vulnerability to flood damage. FEMA flood maps designate Special Flood Hazard Areas (SFHA) which indicate areas of the city that have a 1% annual chance of inundation. A 0.2% annual chance of inundation floodplain has also been designated by FEMA, further detailing the extent of flood hazards in The City of Texas City.

Occurrences

Flood occurrences in the City of Texas City are documented in the National Climatic Data Center (NCDC) Storm Event Database. The NCDC data reports include event details such as property damage, crop damage, injury, and death. Details of floods recorded by the NCDC from 1996 to 2024 may be viewed in Table 7-1.

Table 7-1. NCDC flood records 1996 – 2024

Date	Type	Deaths	Injuries	Property Damage
11/16/1996	Coastal Flood	0	0	$250,000
1/27/1997	Flash Flood	0	0	$5,000
3/25/1997	Flash Flood	0	0	$10,000
4/11/1997	Flash Flood	0	0	$5,000
4/25/1997	Coastal Flood	0	0	$360,000
12/8/1997	Flash Flood	0	0	$3,000
1/6/1998	Flash Flood	0	0	$5,000
6/29/1998	Flash Flood	0	0	$-
9/10/1998	Flash Flood	0	0	$-
10/4/1998	Flash Flood	0	0	$45,000
9/13/2000	Flash Flood	0	0	$100,000
6/5/2001	Flash Flood	0	0	$-
6/8/2001	Flash Flood	0	0	$-
8/28/2001	Flash Flood	0	0	$30,000
8/30/2001	Flash Flood	0	0	$80,000
5/17/2002	Flash Flood	0	0	$150,000
8/15/2002	Flash Flood	0	0	$100,000
11/5/2002	Flash Flood	0	0	$55,000
12/4/2002	Flash Flood	0	0	$20,000
9/1/2003	Flash Flood	0	0	$4,000
8/19/2006	Flash Flood	0	0	$10,000

Table 7-1. NCDC flood records 1996 – 2024

Date	Type	Deaths	Injuries	Property Damage
10/16/2006	Coastal Flood	0	0	$110,000
7/6/2007	Flash Flood	0	0	$-
11/8/2009	Coastal Flood	0	0	$-
12/1/2009	Coastal Flood	0	0	$-
1/9/2011	Coastal Flood	0	0	$5,000
4/12/2015	Flash Flood	0	0	$-
5/12/2015	Flash Flood	0	0	$20,000
8/20/2015	Flash Flood	0	0	$-
10/31/2015	Coastal Flood	0	0	$-
12/27/2015	Coastal Flood	0	0	$-
5/9/2016	Coastal Flood	0	0	$-
12/3/2016	Coastal Flood	0	0	$70,000
4/18/2017	Flash Flood	0	0	$104,000
8/26/2017	Flash Flood	3	0	$10,000,000,000
8/29/2017	Flash Flood	0	0	$1,000
9/11/2018	Flash Flood	0	0	$100,000
9/14/2018	Flash Flood	0	0	$-
10/24/2018	Flash Flood	0	0	$-
12/8/2018	Flash Flood	0	0	$-
12/27/2018	Coastal Flood	0	0	$-
5/22/2019	Coastal Flood	0	0	$-
9/18/2019	Flash Flood	0	0	$-
10/24/2019	Coastal Flood	0	0	$-
10/9/2020	Coastal Flood	0	0	$-
12/29/2022	Flash Flood	0	0	$-
12/30/2022	Flash Flood	0	0	$-
9/15/2023	Flash Flood	0	0	$-
11/30/2023	Flash Flood	0	0	$5,000
4/29/2024	Flash Flood	0	0	$-
6/19/2024	Coastal Flood	0	0	$-
7/8/2024	Flash Flood	0	0	$-
7/20/2024	Flash Flood	0	0	$10,000
7/26/2024	Flash Flood	0	0	$20,000

Additionally, five non-hurricane, flood-related FEMA disaster declarations took place in the City of Texas City between 1953 and 2024. Disaster declarations are made at the county level without published detail of impacts to cities. Consequently, these disasters are not described within the tables. Disaster Declarations are shown in Table 7-2.

Table 7-2. City of Texas City Flood-Related Disaster Declarations1

Disaster Number	Declaration Date	Incident Begin Date	Incident End Date	Public Assistance Grants
398	Jul 11, 1973	Jul 11, 1973	Jul 11, 1973	Information Not Provided
595	Jul 28, 1979	Jul 28, 1979	Jul 28, 1979	Information Not Provided
603	Sep 25, 1979	Sep 25, 1979	Sep 25, 1979	Information Not Provided
1041	Oct 18, 1994	Oct 14, 1994	Nov 8, 1994	Information Not Provided
1257	Oct 21, 1998	Oct 17, 1998	Nov 15, 1998	$33,279,674.22

Probability

Probability and frequency of return were calculated by dividing the number of flood events in the recorded time period for flood hazards by the overall time period that the resource database has recorded events. Estimated probability of future flood events has been calculated for the planning area. The probabilities shown in the table are based on previous occurrences documented by the NCDC database.

Probabilities of future flood events are also subject to the effect of future conditions, such as climate change. The effects of climate change include sea level rise, changes in weather patterns like drought and flooding, and much more. Climate change exacerbates several weather-related factors that contribute to floods, such as rainfall, snowmelt, sea levels, etc. As long-term weather patterns, average temperatures, and sea levels change, so too will the locations, frequencies, and range of anticipated intensities of floods. Flooding is expected to worsen with both climate change and urban development. As more impervious surfaces are created by roads, parking lots, and buildings, the capacity for natural drainage will decrease, increasing the likelihood of flash flooding during heavy rain events. Climate change is projected to bring more intense and

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[1] https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties

unpredictable rainfall, further straining Texas City's drainage infrastructure. Population growth will place more people and public assets, such as schools, hospitals, and transportation systems, at risk, especially in flood-prone areas.

Impact

Impacts of flooding frequently include damage to people, property, buildings, and infrastructure. Flooding may cause bridge and road closures, service disruptions, and injuries and fatalities. Flood impacts are summarized in the planning area table.

Vulnerability

Asset vulnerability to flood can be found in the tables below. Major vulnerabilities are defined as property value, roadway, railroads, and critical facilities within the 100-year floodplain.

NFIP Participation

One of the most powerful tools businesses and homeowners have to protect themselves from flooding is flood insurance through the National Flood Insurance Program (NFIP). The City of Texas City participates in the NFIP.

The City of Texas City has a total of 310 repetitive loss properties, having received a total of $15,892,061.65 in flood insurance payments. Repetitive Loss properties are properties that have received two or more payments of $1,000 within a ten-year period. Of the community's 310 repetitive loss properties, 60 are severe repetitive loss properties. Severe repetitive loss properties are properties that have received four NFIP payments of over $5,000 each.

The City of Texas City has developed mitigation actions related to NFIP compliance and maintenance. These mitigation actions can be seen in Section 17. The City of Texas City identified flooding as a hazard of particular relevance. Consequently, numerous mitigation actions were developed that will help mitigate the impacts of floods. Many of these actions relate to continued compliance with the NFIP and public outreach projects that exceed the NFIP minimum standards. The City of Texas City recognizes the flood mitigation benefits of exceeding the NFIP minimum standards.

Table 7-3. City of Texas City Ordinance

LOCATION OF ORDINANCE LANGUAGE					
Community	**Adoption of NFIP criteria in local regulation**	**Adoption of the latest effective FIRM**	**Latest Effective FIRM Date**	**Implementation/ enforcement of local regulations to develop in SFHAs**	**Designee/ agency responsible for implementing requirements of the NFIP**
City of Texas City	Section 157.25	Section 157.07	08/15/2019	Sections 157.01 – 157.45	Section 157.25

*Ordinance for the City of Texas City is in Appendix D

The implementation of post-event substantial improvement/substantial damage (SI/SD) review starts with an assessment of the damage, to determine the impact and magnitude of the damage/improvement from an event. That assessment may be performed by local, State or Federal personnel using FEMA's Preliminary Damage Assessment Guide. Based on the information collected, if a structure was damaged to an extent that triggers SI/SD, then when repaired, it will have to meet all current building codes and regulations (including current elevation requirements). The SI/SD determination is based on the value of the damaged structure and not land value, which is determined by examining the Galveston County Appraisal District data. Upon request, a notice letter will be sent to property owners stating what the determination was. If the letter states there was SI/SD the property owner can appeal the decision, otherwise the owner can continue the permit application review process. From the permit review process, permits can begin being issued to the property owner and inspections can be performed.

City of Texas City Flood Hazard

LOCATION		EXTENT
Flooding Types	**Major Flooding Source**	**100-yr Storm Maximum Flood Depth (Feet)**
Coastal Riverine Localized	Galveston Bay	3

OCCURRENCES	
Number of Floods (Range: 1996-2024)	**Risk to Health and Safety (No. Incidences by Type)**
54	3 deaths, 0 injuries

PROBABILITY	
Future Flood Events Likelihood	**Return Interval**
193% annual chance	1 flood every 6.2 months

IMPACT			
Parcels in SFHA	**Property Value in SFHA[2]**	**Roadway (Mile)**	**Railroad (Mile)**
2,125	$643,046,110	188	32

VULNERABILITY[3]			
Total Number of Closed Paid Losses		**Total Dollar Amount of Closed Paid Losses**	
2,735		$45,547,605.87	
Repetitive Loss Structures (No.)	**Repetitive Loss Payments**	**Severe Repetitive Loss Structures (No.)**	**Severe Repetitive Loss Payments**
250	$9,241,196.21	60	$6,650,865.44

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[2] Galveston County Appraisal District 2024 Parcels, GIS Data – Galveston Central Appraisal District

[3] FEMA, as of Jan. 13th, 2025

VULNERABILITY (CONT.)	
Repetitive Loss Structure NFIP Occupancy Status	**Number of Repetitive Loss Structures**
Single Family	258
2-4 Family Residential	4
Other Residential	5
Business Nonresidential	4
Other Nonresidential	39

ASSET CLASS	ASSETS IN SFHA
Water	Thomas Mackey WTP
Wastewater	Galveston Bay RV Resort & Marina
	Central WWTF
	Hillman Shrimp and Oyster Co.
	Oxbow Marine Terminal Texas City
	40-Acre Facility WTP
	Texas City Terminal II
	Isp Technologies, Inc.
	San Leon WWTF
	Duratherm Inc
Schools	Hughes Road El
	John And Shamarion Barber Middle
Dams	Galveston County Water Industrial Reservoir Dam
	Gottfried Moller Pump Station ("Pump Station A")
	A.B. Wolvin Pump Station ("Pump Station B")

Figure 7-1. Map of FEMA Floodplains for the City of Texas City – (Infrastructure and Safety)

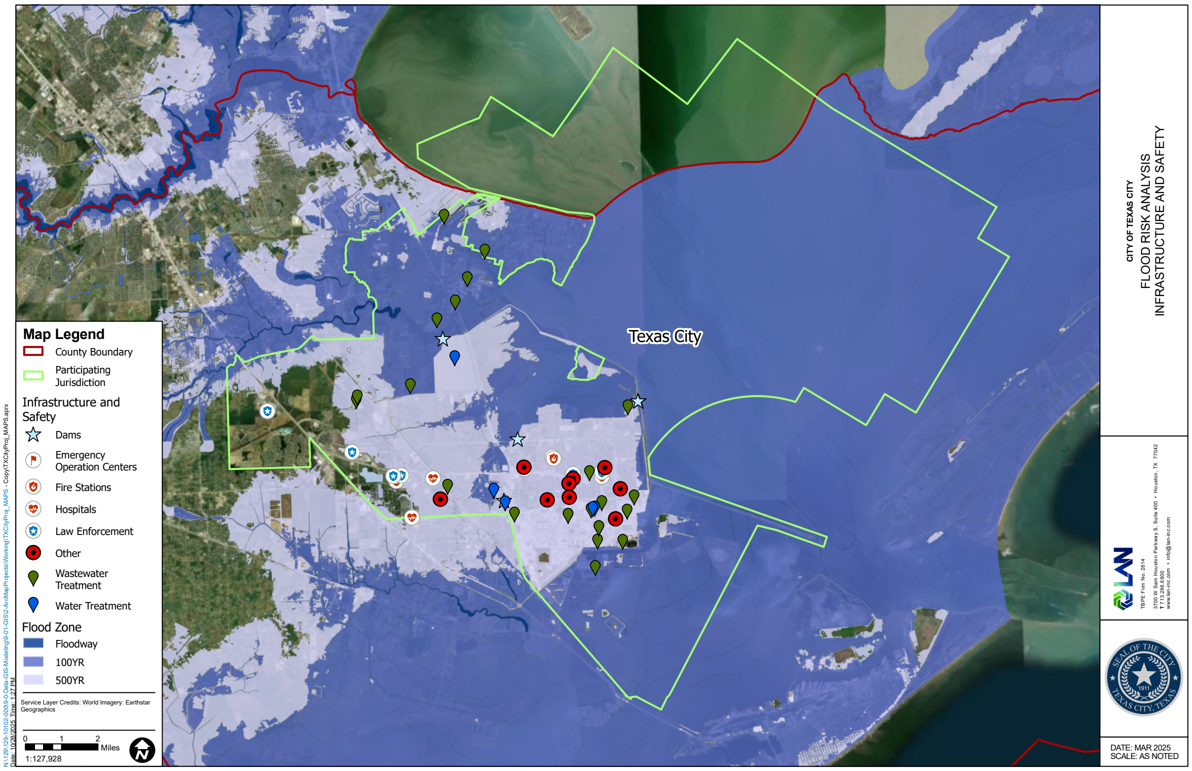


Figure 7-2. Map of FEMA Floodplains for the City of Texas City – (Education)

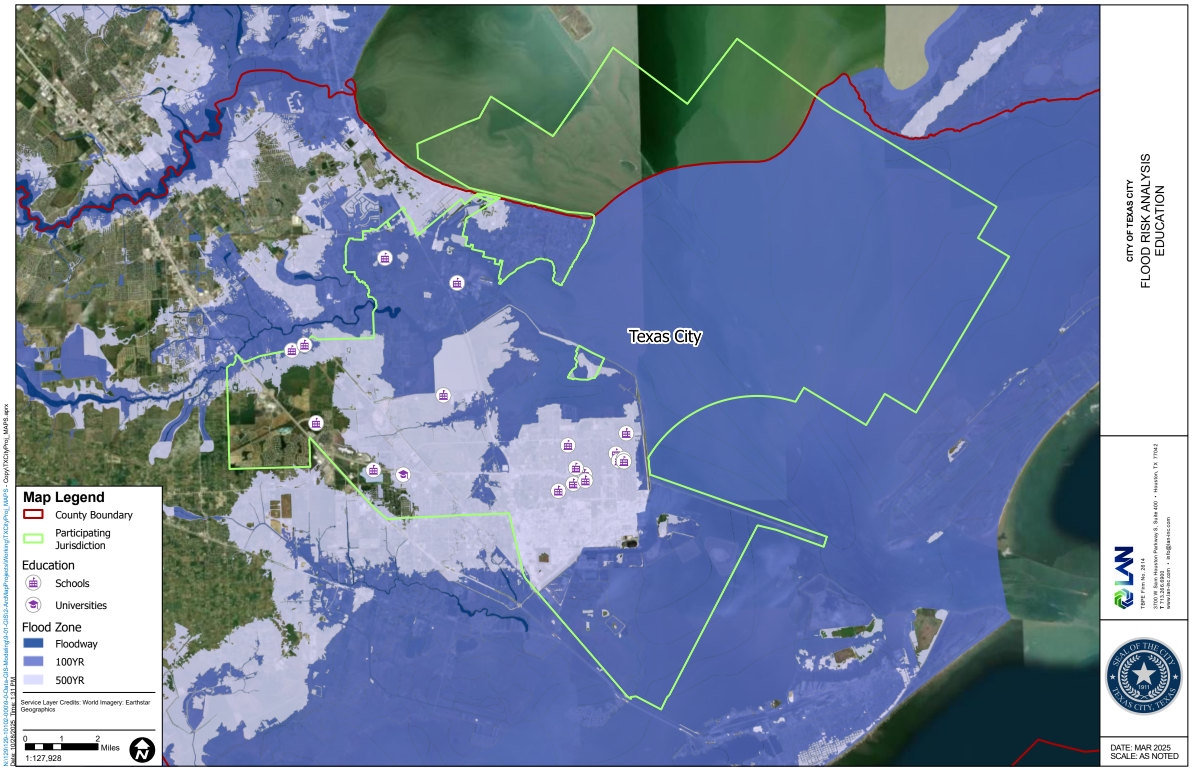
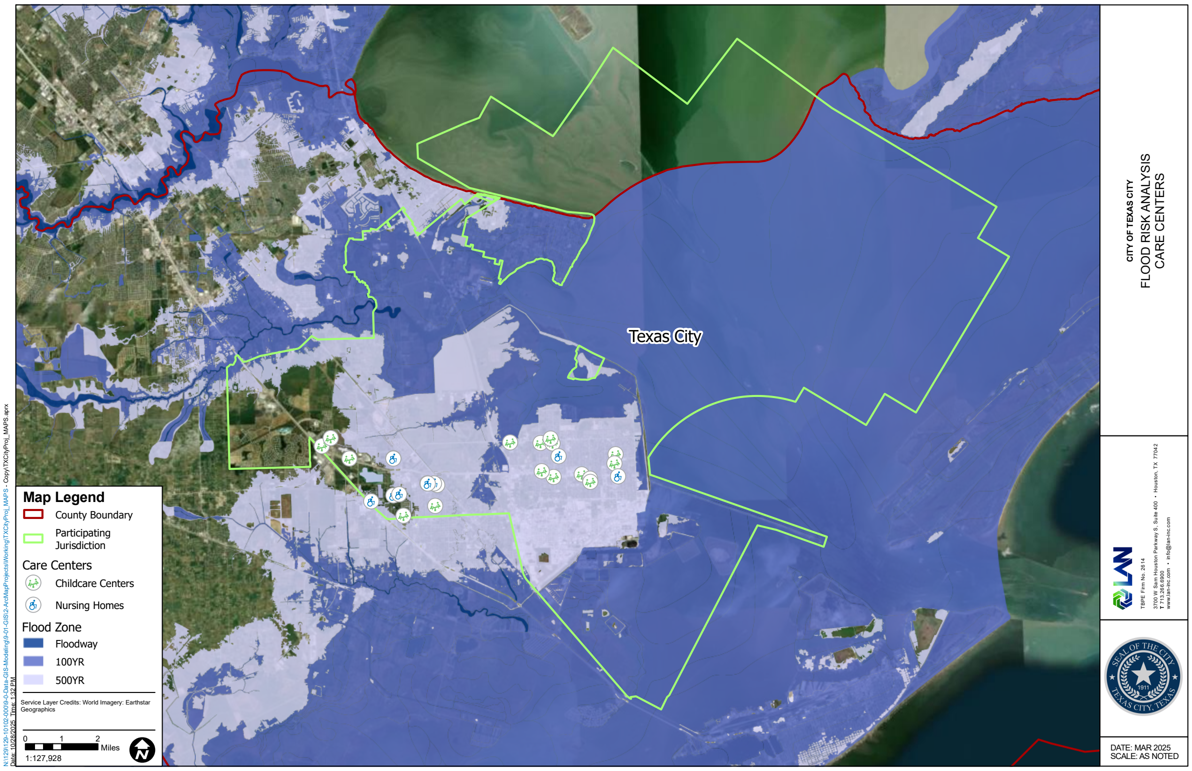


Figure 7-3. Map of FEMA Floodplains for the City of Texas City – (Care Centers)



Section 8: Windstorms

Windstorms Hazard Overview

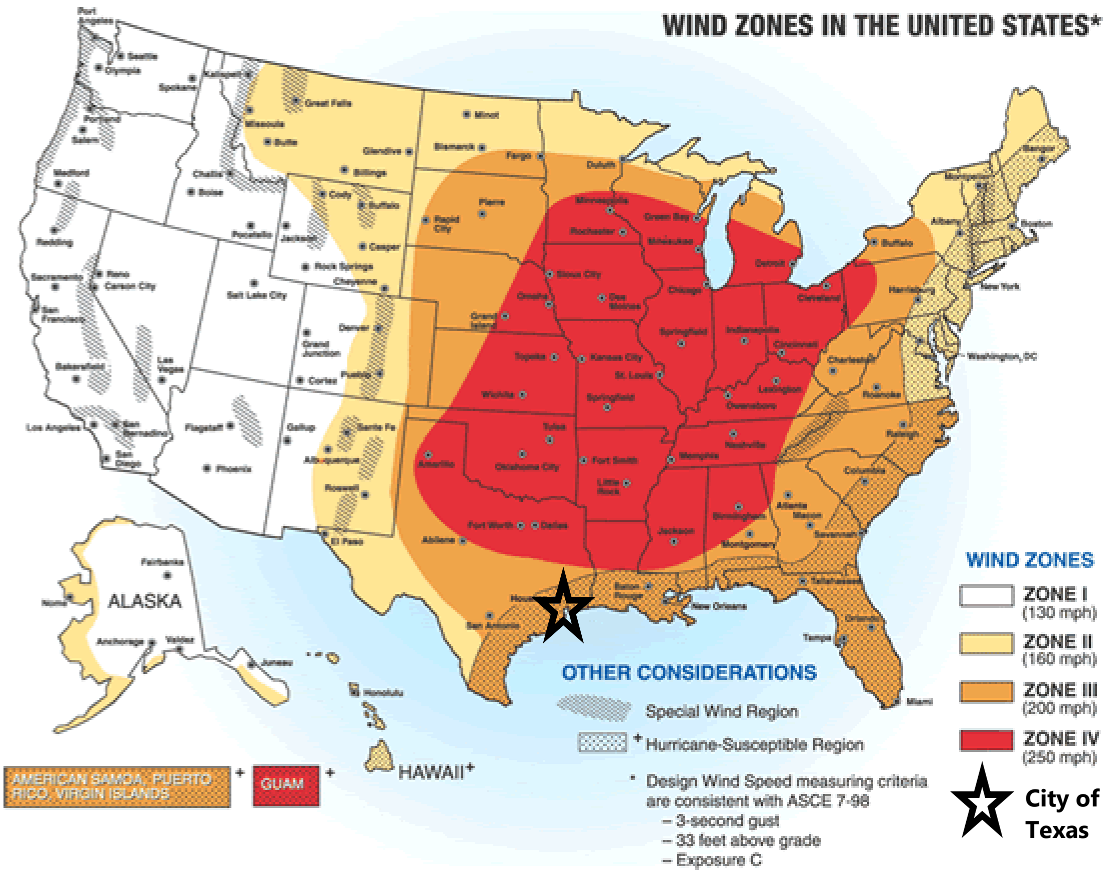
Description

A windstorm is a storm with high winds or violent gusts with little or no rain. The windstorm hazard excludes extreme wind events that occur with other wind-related natural hazards such as hurricanes, tropical storms, and tornados which are addressed elsewhere in this plan.

Location

Windstorms do not have any specific geographic boundary and can occur throughout the planning area uniformly. According to FEMA Wind Zones in the United States, the City of Texas City is in Wind Zone III and is subject to winds as high as 200 mph, as seen in Figure 8-1.

Figure 8-1. FEMA Wind Zones in the United States



The Texas Windstorm Insurance Association (TWIA) was established under the Texas Department of Insurance (TDI) by the Texas Legislature in 1971 following Hurricane Celia. TWIA provides windstorm and hail insurance along the Texas seacoast. Recommended design and inspection requirements for structures along the coast have been developed by TDI based on historical damages.

Extent

The extent of windstorms is defined using the Beaufort Wind Scale. Table 8-1 summarizes the Beaufort Wind Scale.

Table 8-1. Beaufort Wind Scale[1]

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted; small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft. taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft., whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft., white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Moderately high (18-25 ft.) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft.), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft.) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft.) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft., sea completely white with driving spray, visibility greatly reduced	

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[1] www.spc.noaa.gov/faq/tornado/beaufort.html

Occurrences

Windstorms can occur at any time of year, but they are typically more common during the spring and early summer. According to the National Oceanic and Atmospheric Administration (NOAA) Storm Events Database, the City of Texas City has experienced 50 (recorded) windstorm events from 1964 to 2024 (60 years). Table 8-2 includes a summary of windstorm events from 1964 to 2024, categorizing the events by wind speed. Table 8-3 includes a comprehensive list of all windstorm events on record that have affected the City of Texas City. Historical windstorm events are mapped for the City of Texas City, as seen in Figure 8-2.

Table 8-2. Historical Windstorm Occurrence Summary, 1964-2024

Number of Events	Extent (Wind Speed in Knots)						
	Unknown	50-54	55-59	60-64	65-69	70-74	75+
50	20	11	6	7	1	3	2

Table 8-3. Historical Windstorm Events, 1964-2024[2]

Date	Extent (Wind Speed in Knots)	Deaths	Injuries	Property Damage	Crop Damage
6/17/1966	61	0	0	$-	$-
2/13/1969	70	0	0	$-	$-
8/18/1969	52	0	0	$-	$-
12/24/1975	64	0	0	$-	$-
7/17/1979	0	0	0	$-	$-
5/16/1981	0	0	0	$-	$-
5/9/1981	0	0	0	$-	$-
5/13/1982	0	0	0	$-	$-
2/10/1985	0	0	0	$-	$-
11/24/1986	0	0	0	$-	$-
8/21/1986	0	0	0	$-	$-
11/16/1987	89	0	4	$-	$-
3/2/1988	0	0	0	$275,000	$-
5/16/1989	0	0	0	$-	$-
1/14/1991	52	0	0	$-	$-
1/18/1991	0	0	0	$-	$-
6/18/1991	69	0	0	$27,500	$-
6/30/1992	51	0	0	$-	$-
4/5/1993	52	0	0	$-	$-
5/1/1993	0	0	0	$275	$-
5/2/1993	85	0	0	$2,750	$-
5/9/1993	73	0	0	$27,500	$-
5/13/1994	0	0	0	$-	$-
1/12/1995	0	0	0	$2,750	$-
3/13/1995	0	0	0	$-	$-

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[2] NOAA Storm Events Database, 2024

Table 8-3. Historical Windstorm Events, 1964-2024[2]

Date	Extent (Wind Speed in Knots)	Deaths	Injuries	Property Damage	Crop Damage
6/11/1995	56	0	0	$-	$-
6/23/1996	70	0	0	$-	$-
8/12/1996	50	0	0	$5,000	$-
4/27/1997	0	0	0	$5,000	$-
6/17/1997	0	0	0	$160,000	$-
2/10/1998	0	0	0	$3,000	$-
6/6/1998	0	0	0	$3,000	$-
7/14/1998	61	0	0	$25,000	$-
5/2/2000	0	0	0	$1,000,000	$-
7/23/2000	0	0	0	$20,000	$-
9/2/2000	62	0	0	$-	$-
3/14/2001	57	0	0	$-	$-
5/8/2005	61	0	0	$40,000	$-
3/14/2007	52	0	0	$12,000	$-
4/24/2009	51	0	0	$-	$-
6/3/2009	52	0	0	$1,000	$-
11/4/2012	60	0	0	$10,000	$-
1/9/2012	52	0	0	$6,000	$-
4/20/2012	61	0	0	$5,000	$-
10/31/2018	56	0	0	$-	$-
6/9/2018	52	0	0	$3,000	$-
4/7/2019	53	0	0	$-	$6,000
5/9/2019	55	0	0	$-	$-
5/27/2020	56	0	0	$16,500	$-
6/8/2023	58	0	0	$-	$-

Probability

Probability, or frequency of return, was calculated by dividing the number of windstorm events in the recorded time period by the overall time period that the resource database has recorded events. Note, historical events are documented as a function of the path of the storm.

Probabilities of future windstorm events are also subject to the effect of future conditions, such as climate change. The effects of climate change include sea level rise, changes in weather patterns like drought and flooding, and much more. As long-term weather patterns and average temperatures change so too will the locations, frequencies, and range of anticipated intensities of windstorms. Windstorms are expected to be amplified by climate change, population growth, and development. High winds can damage public infrastructure, such as roads, utility lines, and public buildings, resulting in widespread service interruptions and expensive repairs. As the city's infrastructure network expands with urban development, more assets will be vulnerable to wind damage, necessitating stronger building codes and better planning to protect public assets and reduce long-term costs.

Impact

Windstorm impacts are documented by the number of deaths, injuries, property damage, and crop damage. Table 8-4 provides a summary of impacts for the City of Texas City.

Table 8-4. Historical Windstorm Impacts Summary, 1964-2024

Number of Events	Deaths	Injuries	Property Damage	Crop Damage
50	0	4	$1,650,275	$6,000

In addition to the direct, historical impacts in Table 8-4, vulnerable assets and potential maximum impacts are listed in the summary table. Windstorms can cause indirect impacts by damaging power lines and other above-ground utilities. Crop losses and population displacement from housing damage could cause additional economic losses.

Vulnerability

All existing and future buildings, facilities, and populations in and around the City of Texas City are exposed to windstorm hazard and are at potential risk of impact. The damage caused by a windstorm is typically a result of high wind velocity and wind-blown debris. Vulnerability of humans and property is difficult to evaluate given that windstorms form at different strengths and in random locations. Property damage is typically most significant for structures of light construction. Three types of structures are more likely to suffer damage: manufactured homes, homes on crawlspaces (more susceptible to lift), and buildings with large spans, such as shopping malls, gymnasiums, and factories.

City of Texas City Windstorms Hazard

LOCATION	
Area at Risk	**FEMA Wind Zone**
City Wide	Zone III

OCCURRENCE	Extent (Wind Speed in Knots)						
Number of Events	**Unknown**	**50-54**	**55-59**	**60-64**	**65-69**	**70-74**	**75+**
50	20	11	6	7	1	3	2

PROBABILITY			
Number of Events	**Time Period Years**	**Probability**	**Return Interval**
50	60	83%	1 windstorm every 1.2 years

IMPACT[3]				
Number of Events	**Deaths**	**Injuries**	**Property Damage**	**Crop Damage**
50	0	4	$1,650,275	$6,000

VULNERABILITY			
Total Population[4]	**Property Value[5]**		**Crop Land Total[6]**
	Commercial	**Residential**	**Acres**
53,084	$1,279,967,437	$3,479,490,151	11,819

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[3] NOAA Storm Events Database, 2024

[4] U.S. Census Bureau. "ACS Demographic and Housing Estimates." *American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP05*, 2022, https://data.census.gov/table/ACSDP5Y2022.DP05?q=texas city. Accessed on December 4, 2024.

[5] Galveston County Appraisal District 2024 Parcels, GIS Data – Galveston Central Appraisal District

[6] 2023 Annual NLCD, Data | Multi-Resolution Land Characteristics (MRLC) Consortium

Figure 8-2. Map of the City of Texas City Windstorm Events – (Infrastructure and Safety)

Figure 8-3. Map of the City of Texas City Windstorm Events – (Education)

Figure 8-4. Map of the City of Texas City Windstorm Events – (Care Centers)

Section 9: Extreme Heat

Extreme Heat Hazard Overview

Description

Extreme heat is the condition whereby temperatures hover ten degrees or more above the average high temperature in a region for an extended period. If extreme heat conditions persist, it may be considered a heat wave.

Location

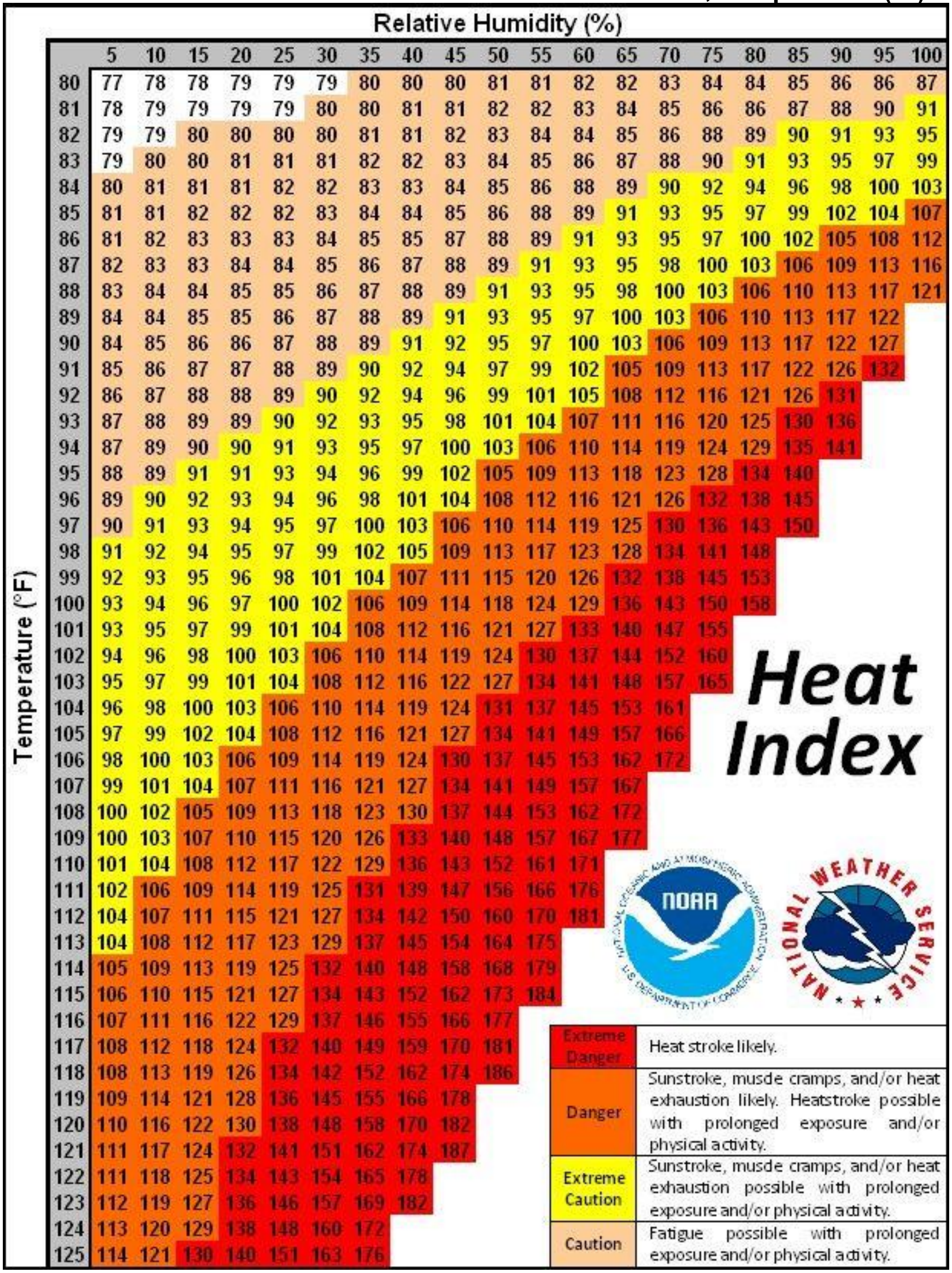
Climate and weather are major drivers of extreme heat. The spatial and temporal ranges at which these forces operate are relatively large scale, putting the entire planning area in risk.

A phenomenon known as heat islanding may mean that urban areas are at slightly higher risk than nearby rural areas. Man-made surfaces such as concrete and asphalt absorb thermal energy from the sun during the day. During nighttime, this thermal energy is released. This cyclical process ensures that ambient temperature remains high through the city. The heat islanding effect may cause temperatures to be up to 10 degrees higher in urban areas than in surrounding rural areas.

Extent

Extreme heat is most dangerous in the summer months. Extreme heat is not just a factor of temperature; humidity plays a role as well. An extreme heat event may occur with air temperature as low as 80°F if the relative humidity is over 40%. An 80°F temperature seems low, particularly for Texas in the summer, so people may not be aware of the risk to extreme heat and therefore may not adequately prepared for the effects of extreme heat. Citizens of the planning area, particularly populations vulnerable to extreme heat, should avoid prolonged heat exposure.

Table 9-1. NOAA's National Weather Service Heat Index, Temperature (F°)



Temperature (°F)	Relative Humidity (%)																			
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
80	77	78	78	79	79	79	80	80	80	81	81	82	82	83	84	84	85	86	86	87
81	78	79	79	79	79	80	80	81	81	82	82	83	84	85	86	86	87	88	90	91
82	79	79	80	80	80	80	81	81	82	83	84	84	85	86	88	89	90	91	93	95
83	79	80	80	81	81	81	82	82	83	84	85	86	87	88	90	91	93	95	97	99
84	80	81	81	81	82	82	83	83	84	85	86	88	89	90	92	94	96	98	100	103
85	81	81	82	82	82	83	84	84	85	86	88	89	91	93	95	97	99	102	104	107
86	81	82	83	83	83	84	85	85	87	88	89	91	93	95	97	100	102	105	108	112
87	82	83	83	84	84	85	86	87	88	89	91	93	95	98	100	103	106	109	113	116
88	83	84	84	85	85	86	87	88	89	91	93	95	98	100	103	106	110	113	117	121
89	84	84	85	85	86	87	88	89	91	93	95	97	100	103	106	110	113	117	122	
90	84	85	86	86	87	88	89	91	92	95	97	100	103	106	109	113	117	122	127	
91	85	86	87	87	88	89	90	92	94	97	99	102	105	109	113	117	122	126	132	
92	86	87	88	88	89	90	92	94	96	99	101	105	108	112	116	121	126	131		
93	87	88	89	89	90	92	93	95	98	101	104	107	111	116	120	125	130	136		
94	87	89	90	90	91	93	95	97	100	103	106	110	114	119	124	129	135	141		
95	88	89	91	91	93	94	96	99	102	105	109	113	118	123	128	134	140			
96	89	90	92	93	94	96	98	101	104	108	112	116	121	126	132	138	145			
97	90	91	93	94	95	97	100	103	106	110	114	119	125	130	136	143	150			
98	91	92	94	95	97	99	102	105	109	113	117	123	128	134	141	148				
99	92	93	95	96	98	101	104	107	111	115	120	126	132	138	145	153				
100	93	94	96	97	100	102	106	109	114	118	124	129	136	143	150	158				
101	93	95	97	99	101	104	108	112	116	121	127	133	140	147	155					
102	94	96	98	100	103	106	110	114	119	124	130	137	144	152	160					
103	95	97	99	101	104	108	112	116	122	127	134	141	148	157	165					
104	96	98	100	103	106	110	114	119	124	131	137	145	153	161						
105	97	99	102	104	108	112	116	121	127	134	141	149	157	166						
106	98	100	103	106	109	114	119	124	130	137	145	153	162	172						
107	99	101	104	107	111	116	121	127	134	141	149	157	167							
108	100	102	105	109	113	118	123	130	137	144	153	162	172							
109	100	103	107	110	115	120	126	133	140	148	157	167	177							
110	101	104	108	112	117	122	129	136	143	152	161	171								
111	102	106	109	114	119	125	131	139	147	156	166	176								
112	104	107	111	115	121	127	134	142	150	160	170	181								
113	104	108	112	117	123	129	137	145	154	164	175									
114	105	109	113	119	125	132	140	148	158	168	179									
115	106	110	115	121	127	134	143	152	162	173	184									
116	107	111	116	122	129	137	146	155	166	177										
117	108	112	118	124	132	140	149	159	170	181										
118	108	113	119	126	134	142	152	162	174	186										
119	109	114	121	128	136	145	155	166	178											
120	110	116	122	130	138	148	158	170	182											
121	111	117	124	132	141	151	162	174	187											
122	111	118	125	134	143	154	165	178												
123	112	119	127	136	146	157	169	182												
124	113	120	129	138	148	160	172													
125	114	121	130	140	151	163	176													

Heat Index

Extreme Danger	Heat stroke likely.
Danger	Sunstroke, muscle cramps, and/or heat exhaustion likely. Heatstroke possible with prolonged exposure and/or physical activity.
Extreme Caution	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Caution	Fatigue possible with prolonged exposure and/or physical activity.

As shown in Table 9-1, The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service Heat Index shows how humidity and temperature interact to endanger people who are engaged in strenuous activity or are exposed to the environment without any protection. It should be noted that these risks exist even if the area is not currently experiencing conditions that qualify as an extreme heat event. The normal high temperatures may be enough to endanger human health.

The NOAA recorded the maximum temperature in the City of Texas City as 109°F, which occurred on August 27, 2023. At a relative humidity of 25%, the temperature corresponds to a heat index exceeding 115°F. Prolonged exposure to, or strenuous activity in, these conditions is extremely dangerous. These conditions are the worst that may be expected in the foreseeable future.

Occurrences

Extreme heat events typically occur in summer months during periods of high heat and high humidity. According to the National Climatic Data Center (NCDC)[1], fourteen extreme heat events took place in City of Texas City from 1999 to 2024, as shown in Table 9-3. All events are recorded at the county level, though comments may reflect noteworthy events at the municipal level.

Table 9-3. Previous Recorded Occurrences of Extreme Heat

Date	Comments
6/26/1999 to 6/28/1999	No recorded comments.
8/1/1999 to 8/31/1999	In August, southeast Texas experienced excessive heat, with Houston Intercontinental Airport surpassing 100°F on 10 days and reaching 95°F on 29 out of 31 days. The month saw record high temperatures on 4 days and record high minimum temperatures on another 4 days. The peak temperature of 105°F on August 20th was the highest recorded at the airport since 1980.
7/6/2000 to 7/23/2000	In July, southeast Texas endured excessive heat, with daily high temperatures ranging from 98°F to 105°F over a two-week period. College Station experienced 12 consecutive days of 100°F or higher temperatures. The highest recorded temperatures were 103°F at Houston Intercontinental and 105°F at College Station. Rainfall was minimal, and 19 heat-related deaths were reported, with 17 in Harris County and 2 in Galveston County.

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[1] NCDC Storm Events Database, https://www.ncdc.noaa.gov/stormevents/

Table 9-3. Previous Recorded Occurrences of Extreme Heat

Date	Comments
8/29/2000 to 8/31/2000	During the last three days of August, southeast Texas experienced excessive heat, with inland areas exceeding 100°F and Galveston reaching 100°F on August 31st. Houston Intercontinental tied its record high of 107°F on the 31st, while College Station recorded 109°F. Three heat-related deaths occurred, all in Harris County.
9/1/2000 to 9/6/2000	In the first week of September 2000, southeast Texas endured a record-breaking heat wave. Houston Intercontinental set new all-time high temperatures with 109°F on September 4th and 108°F on the 5th. College Station recorded its highest-ever temperatures of 112°F on the 4th and 111°F on the 5th. Galveston tied its record of 101°F on the 4th, then broke it with 104°F on the 5th. Temperatures began to cool on the 6th. Houston and College Station each experienced six consecutive days of extreme heat, while Galveston saw its first 100°F days since 1939. This unprecedented heat wave resulted in 5 heat-related deaths, all in Harris County.
6/24/2009 to 6/29/2009	In late June, hot and humid conditions, driven by an upper-level ridge, caused heat indices to exceed 105°F for several days. These extreme conditions led to several indirect heat-related fatalities.
7/9/2009 to 7/10/2009	On July 9th, a hot, humid air mass returned to the area, causing afternoon heat indices to reach as high as 111°F. Sensors recorded a heat index of 108°F in interior parts of Galveston County that afternoon.
6/23/2019 to 6/23/2019	An 18-month-old boy died after being left in a car for five hours. The temperature was 92°F, and the heat index reached 113°F, contributing to the fatality.
6/16/2023 to 6/20/2023	An extended period of excessive heat began in mid-June, with several stretches reaching warning criteria. An Excessive Heat Warning was issued when maximum heat indices exceeded 113°F.
6/25/2023 to 6/27/2023	Another stretch of warning-level heat affected the area, with heat indices reaching around 113°F.
7/12/2023 to 7/13/2023	In July, a prolonged period of extreme heat occurred, with most days at Heat Advisory levels. The first stretch of heat reaching Excessive Heat Warning criteria was from July 12th to 14th. Excessive Heat Warnings were issued for heat index values of 113°F or higher or temperatures exceeding 105°F.
8/5/2023 to 8/15/2023	From August 5th to 26th, the region experienced an extremely hot and humid summer, with excessive heat warnings issued for most days and heat advisories for many others.

Table 9-3. Previous Recorded Occurrences of Extreme Heat

Date	Comments
8/23/2023 to 8/27/2023	The hot and humid summer continued with excessive heat warnings for most days between August 5th and 26th, and heat advisories on several others.
9/5/2023 to 9/9/2023	A heat wave affected much of Southeast Texas in early September, with advisory-level conditions occurring for several days from September 5th to 9th.

The state of Texas is generally very hot in the summer. From 1996 – 2024, 496 heat-related deaths were reported by the NCDC in the state of Texas. Remarkably, forty-nine of the heat-related deaths occurred during the evacuation of Hurricane Rita.

Probability

The fourteen historical heat events reported by NCDC from 1999 to 2023 suggest that the planning area can expect a 58% annual occurrence of extreme heat events. The expected reoccurrence interval of extreme heat events is about 1.71 years. Extreme heat events are expected to take place in summer months based on previous occurrences, which were reported in the months of June through September.

Probabilities of future extreme heat events are also subject to the effect of future conditions, such as climate change. The effects of climate change include sea level rise, changes in weather patterns like drought and flooding, and much more. As long-term weather patterns and average temperatures change, so too will the locations, frequencies, and range of anticipated intensities of extreme heat events. Over the past decade, daily record high temperatures have occurred twice as often as record lows across the continental United States. Heat waves are becoming more common. Extreme heat is projected to become a more frequent and intense hazard due to climate change, with serious implications for public infrastructure and health. As temperatures rise, roads, bridges, and utility systems will face accelerated deterioration, increasing the need for repairs and maintenance. Higher temperatures will also strain the energy grid as demand for cooling increases, potentially leading to power outages. The city's growing population will exacerbate these impacts, with vulnerable populations, including the elderly and low-income residents, facing increased health risks. Development trends that contribute to the urban heat island effect will make extreme heat even more damaging, necessitating strategies like increasing green spaces and improving energy efficiency in public buildings. Heat waves are more dangerous when combined with high humidity. The combination of temperature and humidity is measured by the heat index. The annual number of days with a heat index above 100ºF is currently projected to double, and days with a heat index above 105ºF is projected to triple, nationwide.

Impact

The risks associated with extreme heat tend to most greatly impact humans. Buildings are not likely to be damaged by extreme heat. The populations most at risk are children, the elderly, those in poor health, and those who spend large portions of their time outside. According to the latest compiled study on heat related deaths by the Centers for Disease Control and Prevention (CDC)[2], from 2004 - 2018, the most recent years for which a report of this nature has been compiled, extreme heat exposure led to 10,527 deaths in the United States. The victims of extreme heat tended to be male (70%) and over the age of 65 (38%). The overwhelming majority of deaths (90%) occurred in the summer months of May to September.

Extreme heat can impact agricultural industries in the form of crop or livestock losses. Extreme heat may cause economic impacts related to damage crops and grazing lands caused by reduced productivity of workers.

Vulnerability

Males and those over the age of 65 tend to be the populations most vulnerable to extreme heat hazards. Demographic information regarding these populations is shown below in the planning area table. Agricultural assets are also vulnerable to extreme heat. Livestock and crops can be damaged or killed by extreme heat. Information regarding the vulnerability of agricultural assets for Galveston County is also shown in the summary table.

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[2] CDC Heat-Related Deaths, https://www.cdc.gov/mmwr/volumes/69/wr/mm6924a1.htm

City of Texas City Extreme Heat Hazard

LOCATION	EXTENT FOR MITIGATION (Next Five Years, based on historical data)
City Wide	Up to 109°, Up to 115° Heat Index

OCCURRENCES	PROBABILITY	
Number of Events (1999-2024)	Annual Probability	Return Interval
14	56%	One extreme heat event every 1.8 years

VULNERABILITY		
Total Population[3]	Male Population	Total Population Over 65
53,084	25,265	8,118

IMPACT		
Agricultural Area (Acres)[4]	Agricultural Area (Percentage of Planning Area)	Agricultural Value[5]
11,819	28.60%	$438,411,673

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[3] U.S. Census Bureau. "ACS Demographic and Housing Estimates." *American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP05*, 2022, https://data.census.gov/table/ACSDP5Y2022.DP05?q=texas city

[4] 2023 Annual NLCD, Data | Multi-Resolution Land Characteristics (MRLC) Consortium

[5] Galveston County Appraisal District 2024 Parcels, GIS Data – Galveston Central Appraisal District

Section 10: Lightning

Lightning Hazard Overview

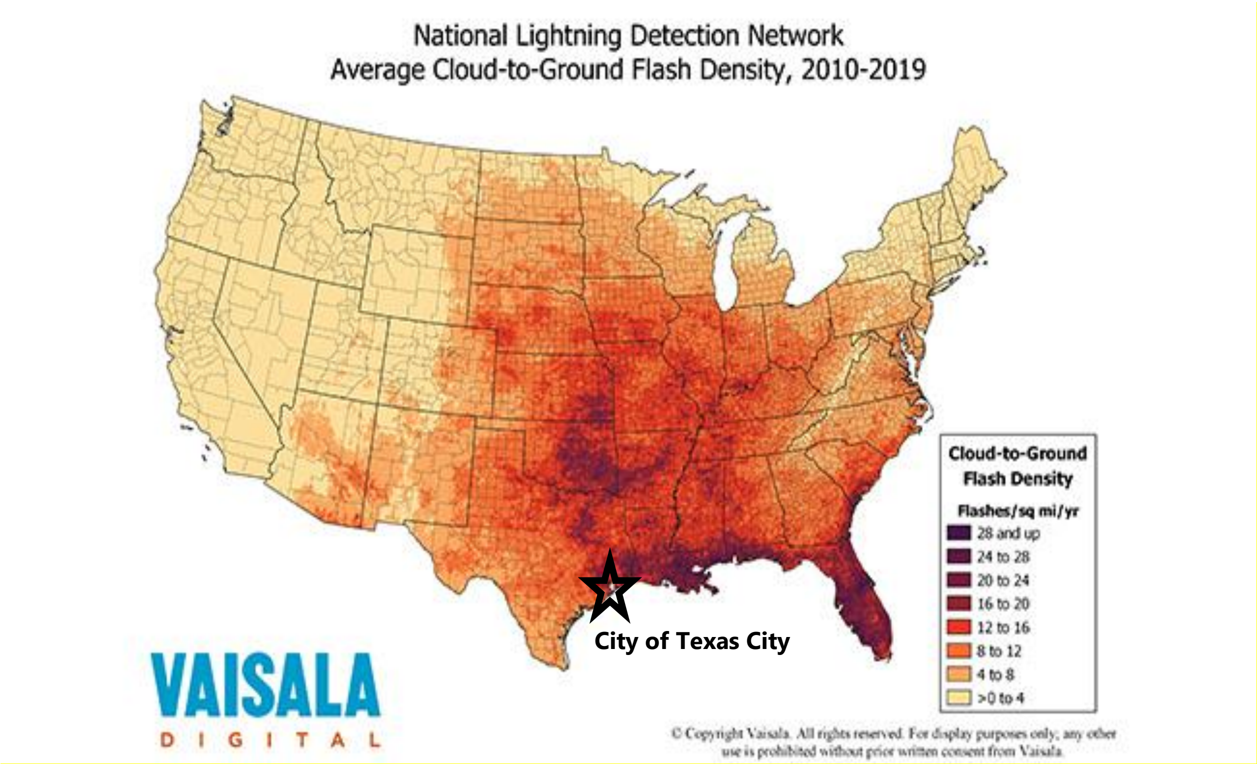
Description

Lightning is a sudden electrostatic discharge during an electrical storm between electrically charged regions of a cloud, between that cloud and another cloud, or between a cloud and the ground.

Location

Worldwide, there is predictable spatial variation in the frequency of lightning strikes. This spatial variation is shown nationally in Figure 10-1. However, when examining lightning activity at smaller scales, such as the county or community level, the distribution of lightning events is evenly distributed. Lightning does not have any specific geographic boundary and can occur throughout the county uniformly. It is assumed that the planning area is uniformly exposed to lightning activity.

Figure 10-1. National Average Cloud-to-Ground Flash Density (2010-2019)



Extent

Lightning extents can be described in terms of the frequency of lightning strikes within a time frame. Lightning Activity Levels (LAL) is one of the metrics used to describe lightning extent. Table 10-1 describes the storm activity and strikes-per-minute associated with the six different Lightning Activity Levels.

Table 10-1. Lightning Activity Levels (LAL)

LAL Value	Cloud and Storm Description[1]	Strikes per 15 min
1	No thunderstorms	
2	Cumulus clouds are common but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation are. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common and lightning is frequent.	16-25
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent and intense.	>25
6	Similar to LAL 3 except thunderstorms are dry.	

The entire planning area is vulnerable to all six levels of lightning activity. The worst lightning extent to the planning area can expect to experience is LAL5, but LAL5 is the least likely to occur with LAL1 & 2 being the most common.

Occurrence

NCDC records ranging from 1996 – 2024 show 24 records of lightning strikes within the planning area.

Lightning occurrences are discussed in greater detail in the planning area table.

Probability

The probability of a lightning strike is calculated by dividing the number of events by the number of years for which records exist.

Probabilities of future lightning events may also be subject to the effect of future conditions, such as climate change. The effects of climate change include sea level rise, changes in weather patterns like drought and flooding, and much more. As long-term weather patterns and average

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[1] From http://www.prh.noaa.gov/hnl/pages/LAL.php

temperatures change, the locations and frequencies of lightning strikes may also change. The impacts of lightning on Texas City's public infrastructure will grow as development expands. Climate change could lead to shifts in weather patterns that increase the frequency of lightning events. Lightning strikes can damage power grids, communication systems, and public buildings, leading to service disruptions and costly repairs. As Texas City's infrastructure footprint grows, more assets—such as utility lines, transformers, and public buildings—will be exposed to lightning risks. The growing population will also increase the number of people potentially affected by outages or infrastructure damage caused by lightning strikes.

Impact

Each individual lightning strike has a very small spatial extent. Only the facilities hit by lightning are expected to be damaged. Facility shutdowns are expected to be less than 24 hours. Deaths are possible, but rare. In 28 years of records from the National Climatic Data Center (NCDC), five deaths caused by lightning were recorded. Three injuries due to lightning were reported.

The incidental impacts of a lightning strike have the potential to be damaging. Lightning strikes have the potential to spark wildfires, cause explosions or fires if they hit combustible materials, or damage power infrastructure. Lightning impacts are provided for the planning area as a function of the potential future losses including commercial property value and agricultural value. Commercial property and Agricultural value for the City of Texas City was compiled from the Galveston County Appraisal District. Agricultural acreage was found using the 2023 USDA Crop Land and National Land Cover Database.

Vulnerability

The vulnerabilities to lightning come in the form of assets that may be damaged by a strike or in the form of agricultural land that would be vulnerable to lightning-started wildfires. Communities with higher concentrations of commercial buildings may be more vulnerable to lightning strikes. Commercial buildings are often taller than residential buildings, particularly single-family residential buildings, and may be at greater risk of lightning strikes.

City of Texas City Lightning Hazard

LOCATION
City Wide

OCCURRENCES[2]		
Number of Events (Range: 1996-2024)	**Risk to Health and Safety (No. Incidences by Type)**	**Property Damage**
24	5 deaths, 3 injuries	$3,834,000

PROBABILITY	
Future Lightning Event Likelihood	**Return Interval**
85.7%	1 lightning event every 1.17 years

IMPACT	
Commercial Property Value[3]	**Agricultural Value**
$1,279,967,437	$438,411,673
Agricultural Area (Acres)[4]	**Agricultural (Percent area of Planning Area)**
11,819	28.6%

Potential lightning impacts are difficult to predict due to the relative rarity of lightning strikes. Using the NOAA storm events database data, an annualized impact of $159,333 is expected. Approximately one fatality from lighting is expected every five years.

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[2] NOAA Storm Events Database, 2024

[3] Galveston County Appraisal District 2024 Parcels, GIS Data – Galveston Central Appraisal District

[4] 2023 Annual NLCD, Data | Multi-Resolution Land Characteristics (MRLC) Consortium

Section 11: Tornado

Tornado Hazard Overview

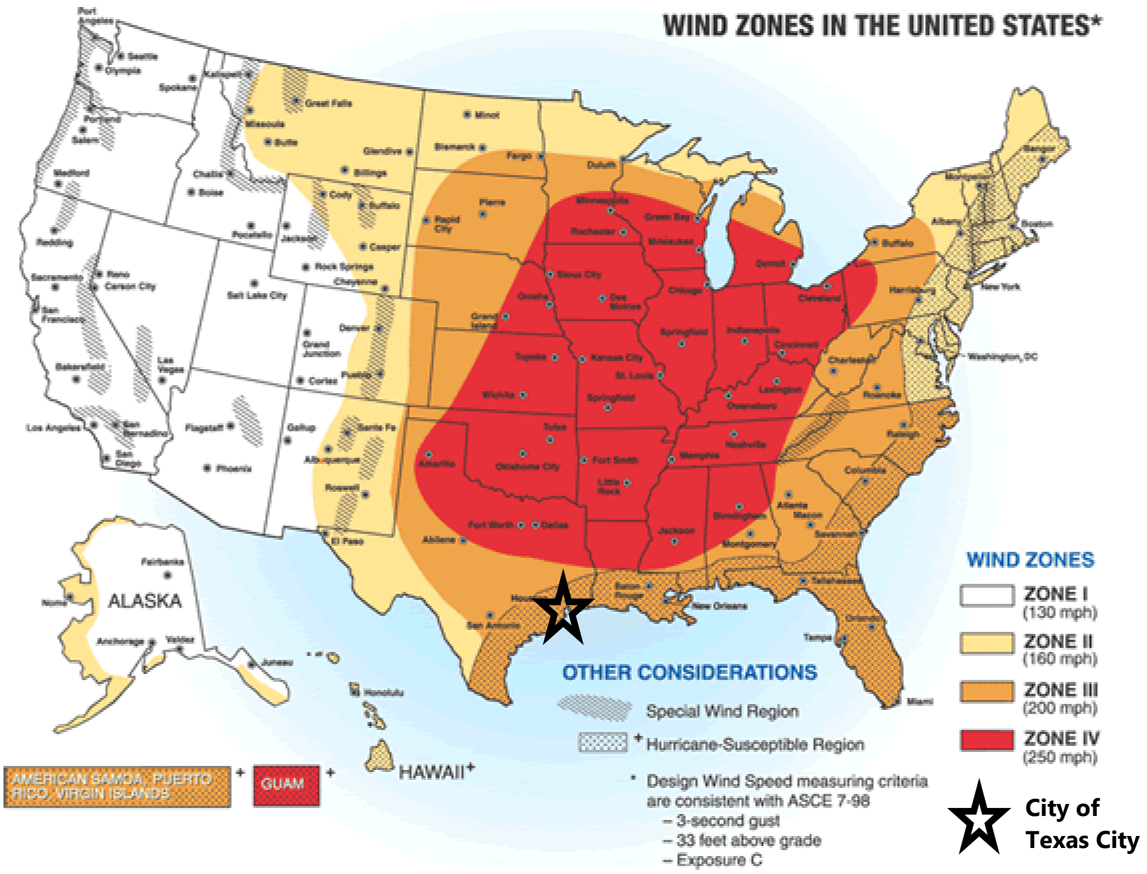
Description

A tornado is a violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. Tornadoes can have wind speeds of 250 miles per hour or more. Damage paths can be in excess of one mile wide and 50 miles long.

Location

Tornadoes do not have any specific geographic boundary and can occur throughout the city uniformly. It is assumed that the planning area is uniformly exposed to tornado activity. According to FEMA Wind Zones in the United States, as shown in Figure 11-1, the City of Texas City is in Wind Zone III, associated with winds as high as 200 mph.

Figure 11-1. FEMA Wind Zones in the United States



Extent

Tornado damage is currently defined using the Enhanced Fujita Scale which took effect on February 1st, 2007; the preceding scale was called the Fujita Tornado Damage Scale. The Enhanced Fujita Scale is summarized in Table 11-1. The Enhanced Fujita Scale has 28 Damage Indicators (DI), or types of structures and vegetation, each with a varying number of Degrees of Damage (DoD). Damage Indicators are summarized in Table 11-2. Each Damage Indicator has a unique Degree of Damage Scale. For example, Small Barns and Farm Outbuildings (SBO) Degree of Damage Scale is provided as Table 11-3. For unique Degree of Damage Scales for the remaining Damage Indicators refer to National Oceanic and Atmospheric Administration (NOAA) website[1].

Based upon the planning area's location in Wind Zone III, which can see winds up to 200 miles per hour, the most powerful tornado the planning area can expect to experience is an EF3.

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[1] http://www.spc.noaa.gov/faq/tornado/ef-scale.html

Table 11-1. Enhanced Fujita Scale[2]

Scale	Wind Speed (mph)	Relative Frequency	Potential Damage	Example of Damage
EF0	65 - 85	56.88%	**Minor or no damage.** Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) are always rated EF0.	
EF1	86 - 110	31.07%	**Moderate damage.** Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.	
EF2	111 - 135	8.80%	**Considerable damage.** Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.	
EF3	136 - 165	2.51%	**Severe damage.** Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations are badly damaged.	
EF4	166 - 200	0.66%	**Extreme damage.** Well-constructed and whole frame houses completely leveled; cars and other large objects thrown up to 300 feet and small missiles generated.	
EF5	> 200	0.08%	**Total destruction of buildings.** Strong-framed, well-built houses leveled off foundations are swept away; steel-reinforced concrete structures are critically damaged; tall buildings collapse or have severe structural deformations; some cars, trucks and train cars can be thrown approximately 1 mile.	

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[2] NOAA

Table 11-2. Damage Indicators

Number	Damage Indicator (Abbreviation)	Degrees of Damage (DoD)
1	Small barns, farm outbuildings (SBO)	8
2	One- or two-family residences (FR12)	10
3	Single-wide mobile home (MHSW)	9
4	Double-wide mobile home (MHDW)	12
5	Apt, condo, townhouse (3 stories or less)	6
6	Motel (M)	10
7	Masonry apt. or motel (MAM)	7
8	Small retail bldg. (fast food) (SRB)	8
9	Small professional (doctor office, branch bank) (SPB)	9
10	Strip mall (SM)	9
11	Large shopping mall (LSM)	9
12	Large, isolated ("big box") retail bldg. (LIRB)	7
13	Automobile showroom (ASR)	8
14	Automotive service building (ASB)	8
15	School - 1-story elementary (interior or exterior halls) (ES)	10
16	School - jr. or sr. high school (JHSH)	11
17	Low-rise (1-4 story) bldg. (LRB)	7
18	Mid-rise (5-20 story) bldg. (MRB)	10
19	High-rise (over 20 stories) (HRB)	10
20	Institutional bldg. (hospital, govt., or university) (IB)	11
21	Metal building system (MBS)	8
22	Service station canopy (SSC)	6
23	Warehouse (tilt-up walls or heavy timber) (WHB)	7
24	Transmission line tower (TLT)	6
25	Free-standing tower (FST)	3
26	Free standing pole (light, flag, luminary) (FSP)	3
27	Tree – hardwood (TH)	5
28	Tree – softwood (TS)	5

Table 11-3. Small Barns and Farm Outbuildings (SBO)

Degrees of Damage (DoD)	Damage Description	Expected Wind Speed (mph)	Lower Bound Wind Speed (mph)	Upper Bound Wind Speed (mph)
1	Threshold of visible damage	62	53	78
2	Loss of wood or metal roof panels	74	61	91
3	Collapse of doors	83	68	102
4	Major loss of roof panels	90	78	110
5	Uplift or collapse of roof structures	93	77	114
6	Collapse of walls	97	81	119
7	Overturning or sliding of entire structure	99	83	118
8	Total destruction of building	112	94	131

Occurrences

Tornado producing storms can occur at any time of year and at any time of day, but they are typically more common in the spring months during the late afternoon and evening hours. A smaller high frequency period can emerge in the fall during the brief transition between the warm and cold seasons. According to the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information Storm Event Database, the City of Texas City has experienced 126 (recorded) tornado events over the course of the record period from 1957 to 2024 (67 years). Table 11-4 includes a summary of tornado events from 1957 to 2006 using the Fujita Scale and Table 11-5 summarizes tornado events from 2007 to 2024 using the latest magnitude scale the Enhanced Fujita Scale. Table 11-6 includes a comprehensive list of all tornadoes on record affecting the planning area. Historical tornado events are mapped for the city in the following sections, as seen in Figure 11-2.

Table 11-4. Historical Tornado Occurrence Summary, 1957-2006

Number of Events	Magnitude (Fujita Scale)					
	F0	F1	F2	F3	F4	F5
26	14	8	3	1	0	0

Table 11-5. Historical Tornado Occurrence Summary, 2007-2024

Number of Events	Magnitude (Enhanced Fujita Scale)					
	EF0	EF1	EF2	EF3	EF4	EF5
6	5	1	0	0	0	0

Table 11-6. Historical Tornado Events, 1957-2024[3]

Date	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
3/17/1957	F2	1	15	$-	$-
6/2/1957	F1	0	0	$-	$-
6/1/1962	F0	0	0	$-	$-
8/30/1963	F1	0	0	$27,500	$-
8/18/1967	F3	0	0	$-	$-
9/20/1967	F0	0	0	$-	$-
5/11/1968	F0	0	0	$-	$-
10/11/1970	F2	0	1	$275,000	$-
7/21/1970	F1	0	0	$27,500	$-
6/16/1971	F0	0	0	$-	$-
6/25/1971	F0	0	0	$275	$-
9/10/1971	F0	0	0	$27,500	$-
1/10/1975	F1	0	0	$27,500	$-
6/25/1976	F0	0	0	$2,750	$-
7/14/1977	F0	0	0	$-	$-
8/11/1979	F0	0	0	$-	$-
8/28/1980	F1	0	0	$275,000	$-
5/9/1981	F2	0	1	$275,000	$-
8/17/1983	F0	0	0	$50	$-
5/18/1985	F0	0	0	$-	$-
11/16/1987	F1	0	4	$-	$-

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[3] NCDC Storm Events Database, https://www.ncdc.noaa.gov/stormevents/

11/21/1992	F0	0	0	$275,000	$-
5/16/1994	F0	0	0	$27,500	$-
6/7/1999	F0	0	0	$0	$-
7/12/1999	F1	0	0	$0	$-
12/30/2002	F1	0	0	$0	$-
2/16/2008	EF0	0	0	$-	$-
11/8/2011	EF0	0	0	$0	$-
1/9/2012	EF0	0	0	$0	$-
7/21/2014	EF0	0	0	$0	$-
8/27/2017	EF0	0	0	$200,000	$-
1/6/2021	EF1	0	0	$500,000	$-

Probability

Probability, or frequency of return, was calculated by dividing the number of tornado events in the recorded time period by the overall time period that the resource database has recorded events for the planning area. Note, historical events are documented as a function of the origin of the touchdown location. A tornado may travel over several miles into the planning area; however, the tornado event is solely recorded for the area of the tornado origin. Table 11-7 provides a general overview of tornado severity, probability, impacts, and defining characteristics. Probability for future tornado events is defined for the planning area within the section.

Probabilities of future tornado events are also subject to the effect of future conditions, such as climate change. The effects of climate change include sea level rise, changes in weather patterns like drought and flooding, and much more. As long-term weather patterns and average temperatures change so too may the locations, frequencies, and range of anticipated intensities of tornado events. Climate change could lead to shifts in storm patterns that increase tornado risk. Population growth and urban expansion will raise the stakes by increasing the number of public assets, homes, and critical infrastructure in tornado-prone areas. Public buildings, such as schools and hospitals, could be severely damaged by tornadoes, leading to service disruptions. New development must incorporate stronger building standards to mitigate tornado damage and protect public safety, especially as more people move into areas vulnerable to severe wind events.

Table 11-7. Tornado Severity Defined

WEAK	STRONG	VIOLENT
• 69% of all tornadoes • Less than 5% of tornado deaths • Lifetime 1-10+ minutes • Winds less than 110 mph	• 29% of all tornadoes • Nearly 30% of all tornado deaths • May last 20 minutes or longer • Winds 110 – 205 mph	• 2% of all tornadoes • 70% of all tornado deaths • Lifetime can exceed one hour • Winds greater than 205 mph

Impact

Tornado impacts are documented by the number of deaths, injuries, property damage, and crop damage. Table 11-8 provides a summary of impacts for City of Texas City as a whole. Impacts to the city are documented in the following sections.

Tornadoes, depending upon extent, have the potential to destroy anything they encounter. Due to the unpredictable locations of tornado touchdowns, it is difficult to identify assets or populations within the planning area that are particularly vulnerable to tornadoes. Due to those two facts, all assets, property, and populations within the planning area are considered vulnerable to tornadoes. Properties within the planning area may experience power outages or other utility failures even if they're not destroyed during a tornado event. Homes destroyed by tornadoes will lead to displaced populations. Crops and commercial property destroyed in tornado events will have negative economic impacts.

Table 11-8. Historical Tornado Impacts Summary, 1957-2024[4]

Number of Events	Deaths	Injuries	Property Damage	Crop Damage
32	1	21	$1,940,575	$0

Vulnerability

Tornadoes typically travel miles once formed: therefore, all existing and future buildings, facilities, and populations in and around the City of Texas City are at potential risk of impact. The damage

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[4] NCDC Storm Events Database, https://www.ncdc.noaa.gov/stormevents/

caused by a tornado is typically a result of high wind velocity, wind-blown debris, lightning, and large hail. Vulnerability of humans and property is difficult to evaluate given that tornadoes form at different strengths and in random locations. Property damage is typically most significant for structures of light construction. Three types of structures are more likely to suffer damage: manufactured homes, homes on crawlspaces (more susceptible to lift), and buildings with large spans, such as shopping malls, gymnasiums, and factories.

City of Texas City Tornado Hazard

LOCATION
City Wide

OCCURRENCE	EXTENT					
Number of Events 1957-2006*	Magnitude (Fujita Scale)					
	F0	F1	F2	F3	F4	F5
26	14	8	3	1	0	0
Number of Events 2007-2024*	Magnitude (Enhanced Fujita Scale)					
	EF0	EF1	EF2	EF3	EF4	EF5
6	5	1	0	0	0	0

* Fujita Scale replaced with Enhanced Fujita Scale in 2007

PROBABILITY				
Number of Events	Record Time Period	Time Period Years	Future Tornado Event Likelihood	Return Interval
32	03/17/1957 to 07/08/2024	67	48% annual chance	1 tornado every 2 years

IMPACT			
Number of Events	Deaths	Injuries	Property Damage
32	1	21	$1,940,575

VULNERABILITY				
Total Population[5]	Property Value[6]		Crop Land	
	Commercial	Residential	Acres[7]	Value
53,084	$1,279,967,437	$3,479,490,151	11,819	$438,411,673

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[5] U.S. Census Bureau. "ACS Demographic and Housing Estimates." *American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP05*, 2022, https://data.census.gov/table/ACSDP5Y2022.DP05?q=texas city.

[6] Galveston County Appraisal District 2024 Parcels, GIS Data – Galveston Central Appraisal District

[7] 2023 Annual NLCD, Data | Multi-Resolution Land Characteristics (MRLC) Consortium

Figure 11-2. City of Texas City Tornado Hazard Map (1957 – 2024) (Infrastructure and Safety)

Figure 11-3. City of Texas City Tornado Hazard Map (1957 – 2024) – (Education)

Figure 11-4. City of Texas City Tornado Hazard Map (1957 – 2024) – (Care Centers)

Section 12: Hailstorm

Hailstorm Hazard Overview

Description

Hail is a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice. Nearly all severe thunderstorms produce hail aloft, though it may melt before reaching the ground. Multi-cell thunderstorms produce many hailstones, but not usually large hailstones. In the life cycle of the multi-cell thunderstorm, the mature stage is relatively short so there is not much time for growth of the hailstone. Supercell thunderstorms have sustained updrafts that support large hail formation by repeatedly lifting the hailstones into the very cold air at the top of the thunderstorm cloud. In general hail 2 inches (5 cm), a little larger than golf ball, or larger in diameter is associated with supercells. Non-supercell storms are capable of producing golf ball size hail. In all cases, the hail falls when the thunderstorm's updraft can no longer support the weight of the ice. The stronger the updraft the larger the hailstone can grow[1]. This process of hail development within a thunderstorm is depicted in Figure 12-1.

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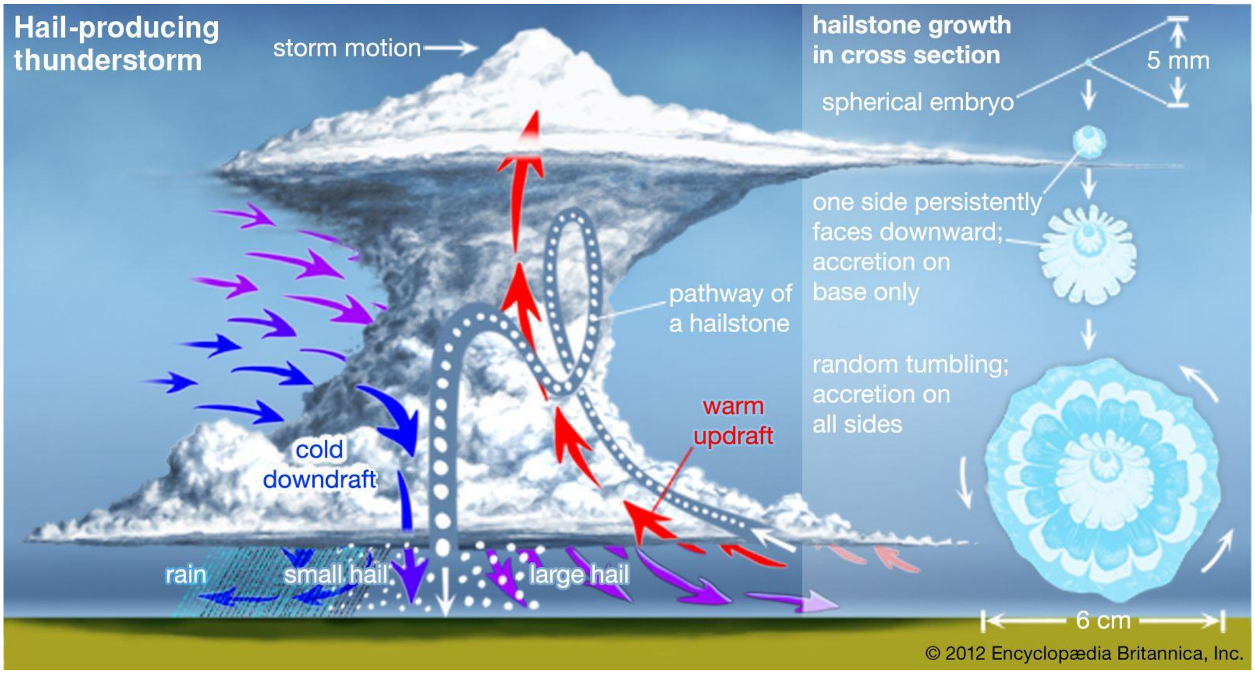
[1] NOAA

Figure 12-1: Hail Development within a Thunderstorm[2]



Location

Hailstorms do not have any specific geographic boundaries and can occur throughout the planning area uniformly. It is assumed that the entire planning area is uniformly exposed to damage from hailstorms.

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[2] Britannica, https://www.britannica.com/science/thunderstorm/Supercell-storms

Extent

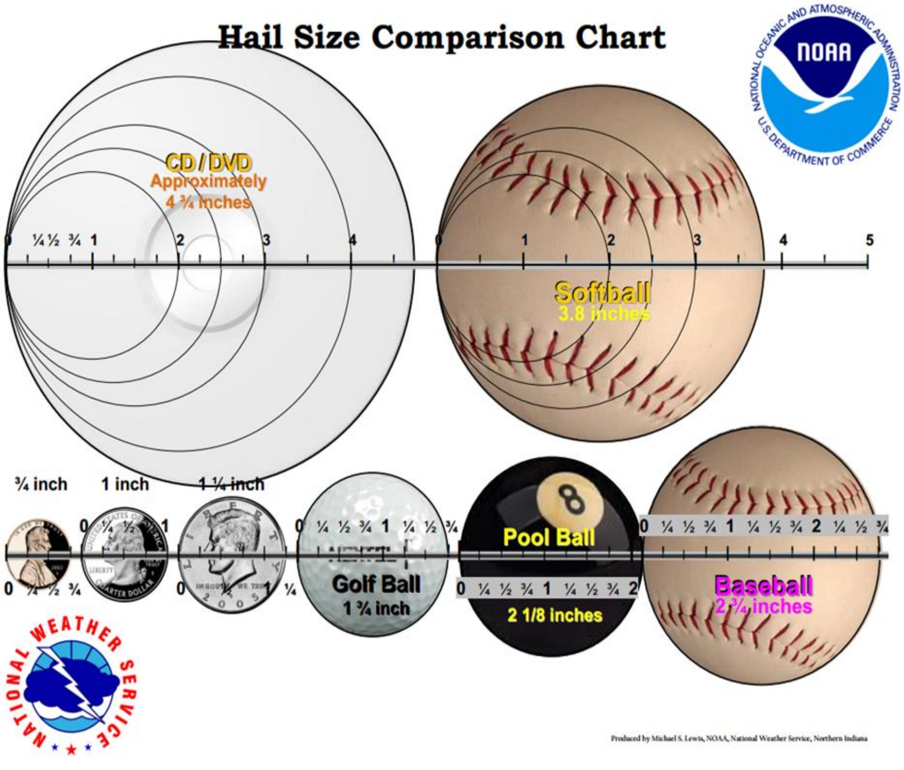
Much of the damage inflicted by hail is to crops. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are the other assets commonly damaged by hail.

Hail has been known to cause injury to humans, and occasionally has been fatal. There have been no recorded fatalities in the region.

Hail size is estimated by comparing it to a known object, as shown in Figure 12-2. Most hailstorms are made up of a mix of sizes, and only the very largest hail stones pose serious risk to people caught in the open. Hail of quarter size and larger is considered severe. The potential damage caused by different hail sizes is show in Table 12-1.

Historically, hailstones up to 4.5 inches in diameter have fallen in the planning area. For future planning purposes, the City of Texas City can expect hailstones up to 4.5 inches in diameter. The extent of hailstorms is uniform across the region.

Figure 12-2: Hail Size Comparison Chart[3]



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[3] NOAA

Table 12-1. Estimating Hail Size[4]

Relative Size	Diameter (inches)	Potential Damage	Example of Damage
Pea	¼″	**Virtually no damage.** Slight Damage to plants.	
Marble	½″	**Virtually no structural damage.** Some damage to plants.	
Quarter	1″	**Some severe damage.** Dents to vehicles. Extensive damage to crops, plants, minor bodily damage.	
Ping Pong Ball	1½″	**Severe damage.** Paint damaged on cars; shingle roof damage; limbs broken; extensive damage to crops. Extensive bodily injury.	
Golf Ball	1¾″	**Severe damage.** Damage to windows, metal roofs pitted, aircraft pitted, trees damaged, total crop damage.	
Tennis Ball	2½″	**Extreme Damage** Damage to roof tiles, Significant structural damage to buildings, risk of serious bodily injury.	
Baseball	3″	**Extreme Damage** Cars and airplanes severely damaged, damage to forests, humans, and animals seriously in danger.	
Softball	4½″	**Total Destruction** Buildings destroyed, fatalities in humans and animals; cars and airplanes destroyed, forest severely damaged.	

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[4] NOAA

Occurrences

Hail producing storms can occur at any time of year and at any time of day, but they are typically more common in the spring and summer months during the late afternoon and evening hours. A smaller, high frequency period can emerge in the fall during the brief transition between the warm and cold seasons. According to the NOAA National Weather Service Storm Prediction Center, the City of Texas City has experienced 30 (recorded) hailstorm events, within a half mile of the city limits, over the course of the record period from 1957 to 2024 (67 years). Table 12-2 includes a summary of hailstorm events from 1957 to 2024, and Table 12-3 includes a comprehensive list of all hailstorms on NOAA National Weather Service Storm Prediction Center database within the City of Texas City. Spatial data for hailstorm occurrences was retrieved from the NOAA's National Weather Service Storm Prediction Center[5], and may be viewed for the planning area in Figure 12-3.

Table 12-2. Historical Hailstorm Occurrence Summary, 1957-2024

Number of Events	Magnitude (Size of Hail)					
	¾"	⅞"	1"	1 ½"	1 ¾"	Over 2"
30	14	2	5	1	8	0

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[5] https://www.spc.noaa.gov/gis/svrgis/

Table 12-3. Historical Hailstorm Events, 1957-2024

Date	Magnitude (Diameter, Inches)	Injuries	Fatalities	Property Damage	Crop Damage
3/21/1957	1.75	0	0	$-	$-
3/1/1965	1.5	0	0	$-	$-
6/17/1966	1.75	0	0	$-	$-
5/9/1981	1	0	0	$-	$-
6/16/1982	1.75	0	0	$-	$-
4/14/1990	0.75	0	0	$-	$-
10/31/1991	1.75	0	0	$-	$-
3/5/1992	0.75	0	0	$-	$-
4/19/1992	0.75	0	0	$-	$-
6/13/1992	1	0	0	$-	$-
4/2/1993	1.75	0	0	$2,750	$-
4/5/1993	0.75	0	0	$275	$-
5/1/1993	0.75	0	0	$2,750	$-
6/18/1994	0.75	0	0	$-	$-
5/11/1995	0.75	0	0	$2,750	$-
4/5/1996	0.75	0	0	$5,000	$-
4/22/1996	0.75	0	0	$5,000	$-
11/5/1997	0.88	0	0	$5,000	$-
2/1/1998	0.75	0	0	$3,000	$-
2/16/1998	0.75	0	0	$3,000	$-
5/30/2002	1.75	0	0	$20,000	$-
5/8/2005	1.75	0	0	$20,000	$-
6/30/2008	0.75	0	0	$-	$-
2/1/2009	1	0	0	$2,000	$-
4/20/2012	1.75	0	0	$3,000	$-
1/8/2016	0.75	0	0	$-	$-
2/26/2019	0.88	0	0	$-	$-
5/28/2020	0.75	0	0	$10	$-
1/6/2021	1	0	0	$-	$-
6/8/2023	1	0	0	$-	$-

Probability

Probability, or frequency of return, was calculated by dividing the number of hailstorm events in the recorded time period by the overall time period that the resource database has recorded. A hailstorm may travel over large distances; however, the hailstorm event is solely recorded for the hailstorm origin. Table 12-4 provides a general overview of hailstorm severity, probability, impacts, and defining characteristics. Probability for future hailstorm events is defined for the city and its respective county in the following sections based on NCDC Storm Events Database records.

Probabilities of future hailstorm events are also subject to the effect of future conditions, such as climate change. The effects of climate change include sea level rise, changes in weather patterns like drought and flooding, and much more. As long-term weather patterns and average temperatures change so too may the locations, frequencies, and range of anticipated intensities of hailstorm events. The risk of hailstorms damaging public infrastructure will grow as climate change intensifies storm activity and development expands. Hail can cause significant damage to roofs, vehicles, and outdoor public spaces, leading to costly repairs for public buildings and infrastructure like roads and bridges. As Texas City's population grows and development spreads, more public assets will be exposed to hail risks, increasing the financial burden on the city to maintain and repair infrastructure. The need for resilient building materials and improved stormwater management systems will grow to mitigate hail damage.

Table 12-4. Hailstorm Severity Defined

Damage Classification	Percentage of all Hailstorms	Property Damage	Deaths/Injuries
Minor	36%	$0 to $500	No bodily injuries if exposed to the hail.
Severe	45%	$500 to $100,000	Minor bodily injuries if exposed to the hail.
Extreme	17%	$100,000 to $5,000,000+	Fatalities possible if exposed to hail.

Impact

Hailstorm impacts are documented by the number of deaths, injuries, property damage, and crop damage. Table 12-5 provides a summary of impacts for the City of Texas City as a whole. Impacts to the city is documented in the following sections.

Table 12-5. Historical Hailstorm Impacts Summary, 1957-2024[6]

Number of Events	Deaths	Injuries	Property Damage	Crop Damage
30	0	0	$74,535	Unknown

Vulnerability

All existing and future buildings, facilities, and populations in and around the City of Texas City are at potential risk of impact. The damage caused by hail is dependent upon the size of the "hail stones" and result in damage to vehicles, buildings, roofs, plants, trees, and especially crops. Vulnerability of humans and property is difficult to evaluate given that hailstorms form at different strengths and in random locations. Property damage is typically most significant for vehicles and structures of light construction. Two types of structures are more likely to suffer damage: manufactured homes and recreational vehicles. Agricultural crops are especially vulnerable to 1" or greater size hail and can lead to total crop failure. Vulnerability is defined for the city and its respective county in the following sections.

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[6] NCDC Storm Events Database, https://www.ncdc.noaa.gov/stormevents/

City of Texas City Hailstorm Hazard

LOCATION
City Wide

OCCURRENCE	EXTENT					
Number of Events	Magnitude (Size of Hail)					
	¾"	⅞"	1"	1 ½"	1 ¾"	Over 2"
30	14	2	5	1	8	0

PROBABILITY[7]				
Number of Events	Record Time Period	Time Period Years	Future Hailstorm Event Likelihood	Return Interval
30	1957 to 2024	67	45%	1 hailstorm every 2.2 years

IMPACT				
Number of Events	Deaths	Injuries	Property Damage	Crop Damage
30	0	0	$74,535	Unknown

VULNERABILITY				
Population[8]	Property Value[9]		Crop Land	
	Commercial	Residential	Acres[10]	Value
53,084	$1,279,967,437	$3,479,490,151	11,819	$438,411,673

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[7] Storm Prediction Center Severe Weather GIS (SVRGIS) Page

[8] U.S. Census Bureau. "ACS Demographic and Housing Estimates." *American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP05*, 2022, https://data.census.gov/table/ACSDP5Y2022.DP05?q=texas city.

[9] Galveston County Appraisal District 2024 Parcels, GIS Data – Galveston Central Appraisal District

[10] 2023 Annual NLCD, Data | Multi-Resolution Land Characteristics (MRLC) Consortium

Figure 12-3. City of Texas City Hailstorm Hazard Map (1957-2024) (Infrastructure and Safety)

Figure 12-4. City of Texas City Hailstorm Hazard Map (1957-2024) – (Education)

Figure 12-5. City of Texas City Hailstorm Hazard Map (1957-2024) – (Care Centers)

Section 13: Expansive Soils

Expansive Soils Hazard Overview

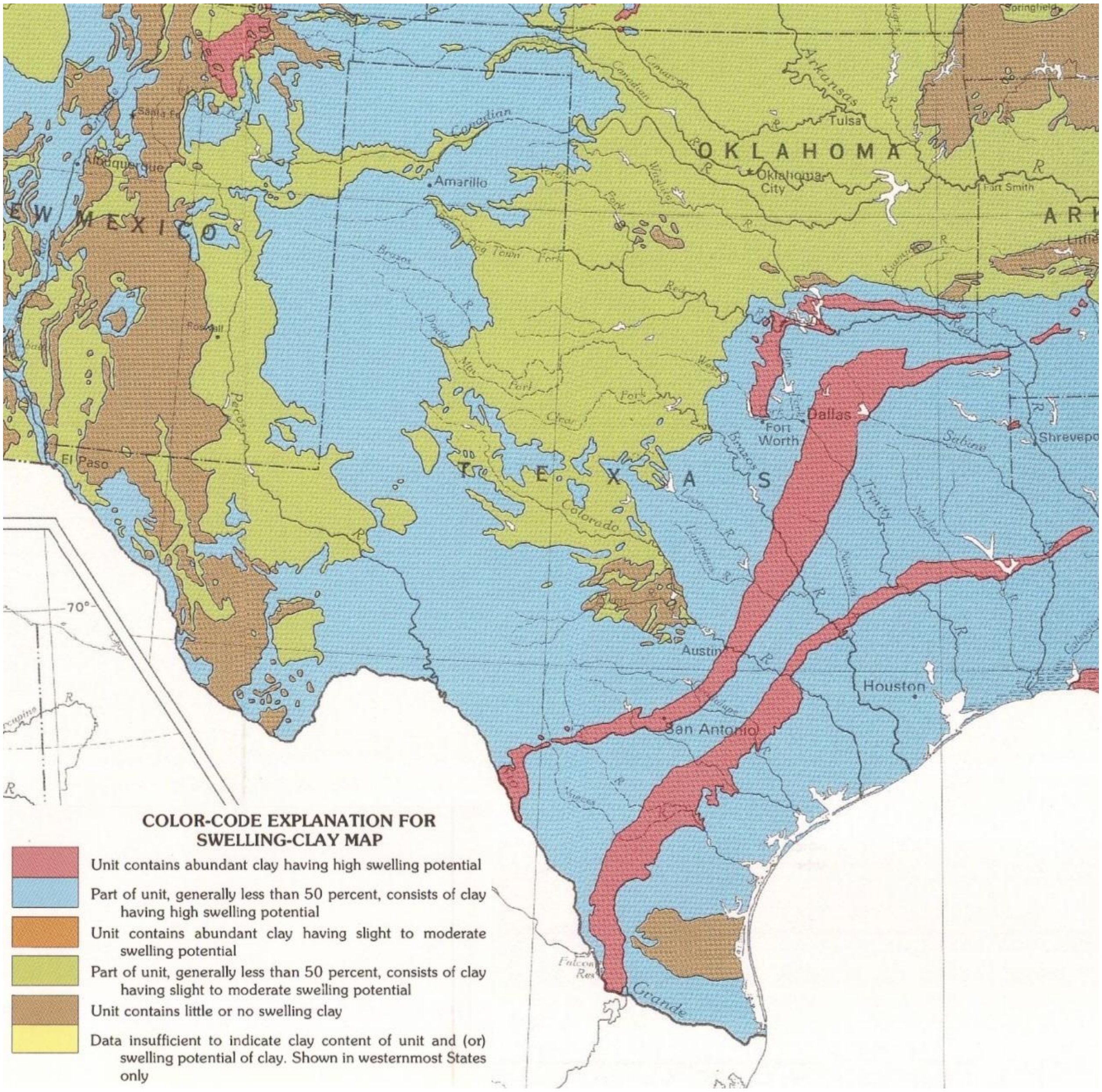
Description

Expansive soils contain minerals such as clay that are prone to large volume changes (swelling and shrinking). Soils with a high content of expansive minerals can shrink in drier seasons forming deep cracks. This shrinkage can remove support from buildings or other structures and result in damaging subsidence.

Location

Expansive soils with high clay content can expand to as much as 15 times its original volume. The soils in the City of Texas City, and most of the Texas Gulf Coast, typically contain less than 50 percent of clay soils that have a high swelling potential. Swelling potential across Texas is illustrated in Figure 13-1.

Figure 13-1. Swelling-Clay Map of Texas[1]



A USDA soil survey for Webb County indicates that approximately 74.99% of the City of Texas City's land surface consists of clay soils as indicated in Table 13-1.

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[1] Swelling clays map of the conterminous United States by Olive, W.W., Chleborad, A.F., Frahme, C.W., Shlocker, Julius, Schneider, R.R., and Schuster, R.L.. https://ngmdb.usgs.gov/Prodesc/proddesc_10014.htm

Table 13-1. City of Texas City Clay Soil Survey[2]

CITY OF TEXAS CITY -PERCENTAGE OF CLY SOILS				
Symbol	**Soil Name**	**Acres**	**%**	
AeB	Arents, clayey	306.03	0.30%	**Percentage Excluding Water Surface**
Ar	Aris fine sandy loam	82.52	0.08%	
Ba	Bacliff clay	1,755.32	1.70%	
Bd	Bernard clay loam	4,073.76	3.94%	
BE	Bernard-Edna complex	207.84	0.20%	
Ed	Edna loam	1,529.95	1.48%	
ER	Edna-Aris complex	353.40	0.34%	
Fo	Follet clay loam	2,212.37	2.14%	
Fs	Francitas clay loam	894.07	0.86%	
FtU	Francitas-Urban land complex	3,206.56	3.10%	
IjD	Ijam loam	450.09	0.43%	
Ke	Kemah silt loam	1,415.98	1.37%	
KU	Kemah-Urban land complex	3,788.61	3.66%	
Lc	Lake Charles clay	7,478.97	7.23%	
LcUB	Lake Charles-Urban land complex	61.89	0.06%	
MoC	Mocarey-Cieno	1,889.76	1.83%	
Na	Narta fine sandy loam	811.62	0.78%	
Tm	Tracosa mucky silty clay	360.13	0.35%	
TR	Tracosa-Amarada	141.30	0.14%	
Va	Vamont clay	49.15	0.05%	
Ve	Verland silty clay loam	2,338.08	2.26%	
Land Surface	**Total Clay Soils**	33,407.40	32.27%	**74.99%**
	Other Soils	11,140.35	10.76%	**25.01%**
	Total Land Surface	**44,547.76**		
	Water Surface	58,961.74	56.96%	
	Total City of Texas City	**103,509.49**	**100%**	

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[2] USDA Web Soil Survey, Web Soil Survey

Extent

Section 618.41 of the National Soil Survey Handbook (NSSH), by the USDA's Natural Resources Conservation Service, indicates expansive soils can be measured as a percent of the volume change of an oven-dried soil sample when it changes from moist to dry conditions. This percentage is called the Linear Extensibility Percent (LEP). The LEP is calculated as indicated in Figure 13-2.

Figure 13-2. Linear Extensibility Percent (LEP) Formula[3]

$$\text{COLE} = \frac{\text{(moist length) - (dry length)}}{\text{dry length}}$$

COLE = Coefficient Of Linear Extensibility

LEP = COLE x 100

The higher the LEP percentage the greater the amount the soil will shrink and swell. LEP can be expressed in four Shrink-Swell classifications from Low to Very High as indicated in Table 13-2. The shrinking and swelling of soils with Moderate to Very High LEP can damage buildings, roads, buried infrastructure such as pipelines, and other structures. High to Very High LEP soils can even damage plant roots. Figure 13-3 graphically illustrates the distribution of soils for the City of Texas City and surrounding areas by LEP Shrink-Swell classifications. The soil distributions for the planning area may be viewed in Figure 13-4.

Table 13-2. Shrink-Swell Classifications[4]

Shrink-Swell Class	Linear Extensibility Percent (LEP)
Low	< 3.0%
Moderate	3.0% - 5.9%
High	6.0% - 8.9%
Very High	≥9.0%

Figure 13-3. City of Texas City Soil Distribution by LEP Shrink-Swell Classification

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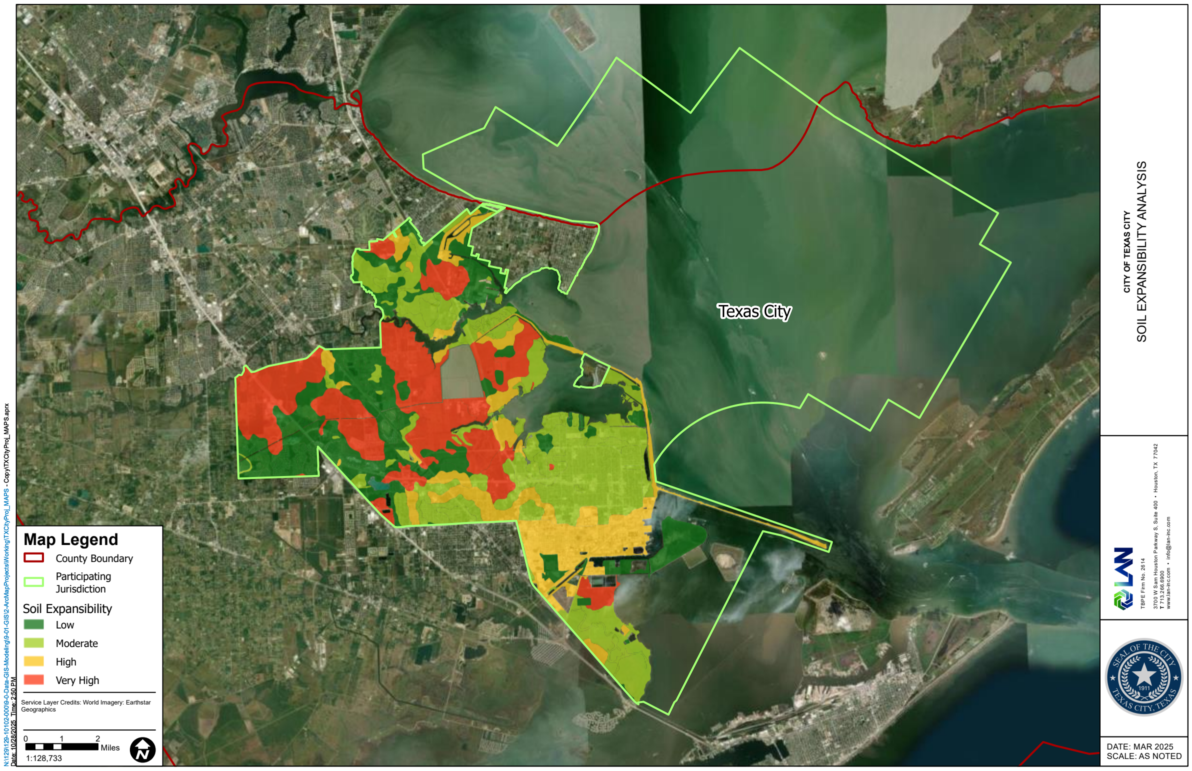
[3] USDA Web Soil Survey

[4] USDA Web Soil Survey



Occurrences

Expansive soils are a condition that is native to the soil characteristics for specific geographic locations and "cannot be documented as a time-specific event, except when it leads to structural and infrastructure damage."[5]

Damage due to expansive soils started to increase significantly in the 1960s when construction materials and foundations for residential homes started changing from pier and beam foundations with flexible sidings like wood, to rigid monolithic concrete slab-on-grade foundations with brick and other masonry sidings. The rigid foundations with rigid sidings are less forgiving and are readily damaged by the differential swelling and shrinking cycles of expansive soils.

No events have occurred that led to a state or federal declared disaster since the last plan update. The City plans to update and/or develop regulations and permits to address hazards prone to the area and include any changes in future development areas. The City will also develop regulation restricting development in areas with soil considered poor or unsuitable for development.

Probability

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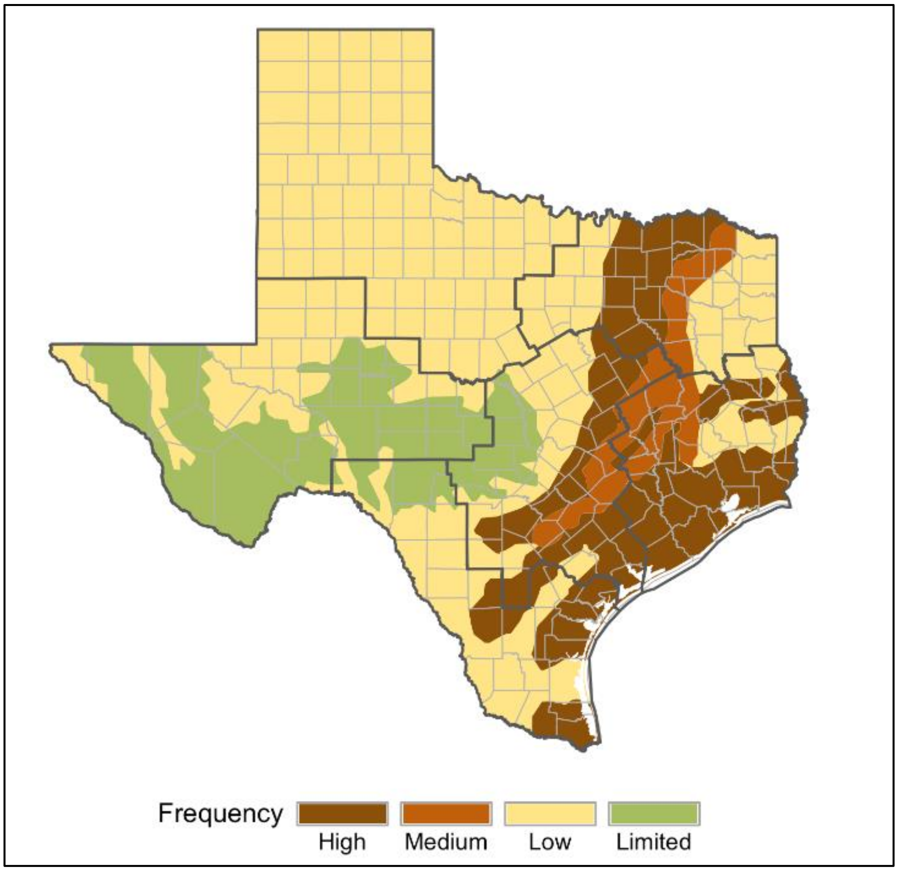
[5] State of Texas Mitigation Plan, 2023

While damage due to expansive soils hazard is present in the City of Texas City, it is not well documented. Private claims documenting damages exclusively caused by expansive soils are typically not made available in the public domain. Figure 13-4 shows expansive soil locations and frequencies within Texas. This map shows Texas City in a designated high area of expansive soil frequency. Other hazards, like drought, can exacerbate the possibility of expansive soil damages. The drought probabilities shown in Table 13-3 are based on historical data ranging from 1937 to 2024. Droughts drive the expansibility and shrinkage of soils in the planning area.

Figure 13-4. Location and Frequency of Expansive Soils in Texas[6]



Probabilities of future expansive soil events are also subject to the effect of future conditions, such as climate change.

Future expansive soil hazard probability is also evaluated by utilizing drought and rainfall data which affect soil's expansive and shrinking properties. Shrinking, swelling, and cracking of soil under structures can result in foundational and structural issues that can result in major structural

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[6] State of Texas Hazard Mitigation Action Plan, 2023

damage and pose a hazard to residents. Table 13-3 shows the annual chance of droughts by severity which can stimulate the shrinking and swelling of expansive soils.

Table 13-3. City of Texas City Drought Probability

Annual Chance of Drought (PHDI <-1)	Magnitude (PHDI Description)				
	Annual Chance of Incipient Drought	Annual Chance of Mild Drought	Annual Chance of Moderate Drought	Annual Chance of Severe Drought	Annual Chance of Extreme Drought
52.5%	8.3%	24.0%	13.3%	5.5%	1.4%

In addition, rainfall data shows that Texas City receives rainfall higher than the nation-wide average which can further accelerate shrinking and swelling of expansive soils. From 2000 to 2020, Texas City saw an average of 46 inches of rain annually. The maximum annual rainfall during this period was 64.22 inches. Texas City's annual rainfall is in the top 3% of cities in Texas. Additionally, Texas City has a 56% annual chance for an extreme heat event and a 52.5% annual chance of drought. This inundation of expansive soils and subsequent drying creates a high likelihood of expansive soils hazards affecting structures within the planning area.

Impact

Swelling and shrinkage typically varies depending on the amounts of moisture content and clay content. Uneven shrink/swell cycles are what causes damage to building foundations, walls, roadway pavement, sidewalks, underground piping, and other structures. Lightweight types of foundations like concrete pavement for roads and concrete slab on grade foundations are particularly susceptible to damage from the shrink/swell cycle. Cracked foundations, floors, and basement walls are typical types of damage done by swelling soils.

Private claims documenting expansive soil damage are not well documented in the public domain. The hazard of expansive soils should not severely impact Texas City residents.

The effects of climate change include sea level rise, changes in weather patterns like drought and flooding, and much more. As long-term weather patterns and average temperatures change so too may frequencies and range of anticipated intensities of expansive soil swelling and shrinkage events. Expansive soils pose a significant risk to public infrastructure, particularly roads, bridges, and building foundations. Climate change is expected to exacerbate soil movement due to more variable rainfall patterns, leading to increased damage to infrastructure. As Texas City's population grows and development continues, more buildings and public facilities will be constructed on soil types prone to expansion. This will increase the costs of infrastructure maintenance and repair, especially in areas with heavy development. Incorporating soil stabilization techniques and better land-use planning will be critical in addressing these risks.

Impact can be measured in terms of property damage when such data is made available.

Vulnerability

Expansive soils primarily represent a threat to buildings and subterranean infrastructure. Crops and people are not typically directly threatened by expansive soils. Vulnerabilities to expansive soils are determined by examining what critical assets and properties are in different areas of soil expansibility. Assets in areas of moderate to very high expansive soil areas are shown in Figure 13-3 and Figure 13-5.

City of Texas City Expansive Soils Hazard

LOCATION
City Wide

OCCURRENCES	PROBABILITY
Ongoing	Ongoing and increasing (see Table 13-3)

IMPACT & VULNERABILITY			
VULNERABLE NON-CRITICAL FACILITIES: PROPERTY[7]			
PROPERTY CLASS	SHRINK-SWELL RISK CLASS	VALUE	
		AMOUNT	PERCENTAGE
Residential	Low	$1,018,881,834	29.54%
	Moderate	$1,914,871,851	55.52%
	High	$191,216,419	5.54%
	Very High	$324,169,746	9.40%
Commercial	Low	$270,510,952	21.13%
	Moderate	$649,399,279	50.74%
	High	$50,031,572	3.91%
	Very High	$310,025,634	24.22%
TOTAL:		**$4,729,107,287**	

VULNERABILITY (CONT.)		
VULNERABLE NON-CRITICAL FACILITIES: ACREAGE		
SHRINK-SWELL RISK CLASS	ACRES	
	AMOUNT	PERCENTAGE
Low	10,353	25%
Moderate	13,156	32%
High	7,003	17%
Very High	10,600	26%

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[7] Galveston County Appraisal District 2024 Parcels, GIS Data – Galveston Central Appraisal District

VULNERABILITY (CONT.)	
VULNERABLE CRITICAL FACILITIES	
SHRINK-SWELL RISK CLASSIFICATION	**ASSET COUNT IN SHRINK-SWELL RISK AREA**
Low	21
Moderate	52
High	19
Very High	13

Figure 13-5. City of Texas City Soil Expansibility Hazard Map – (Infrastructure and Safety)

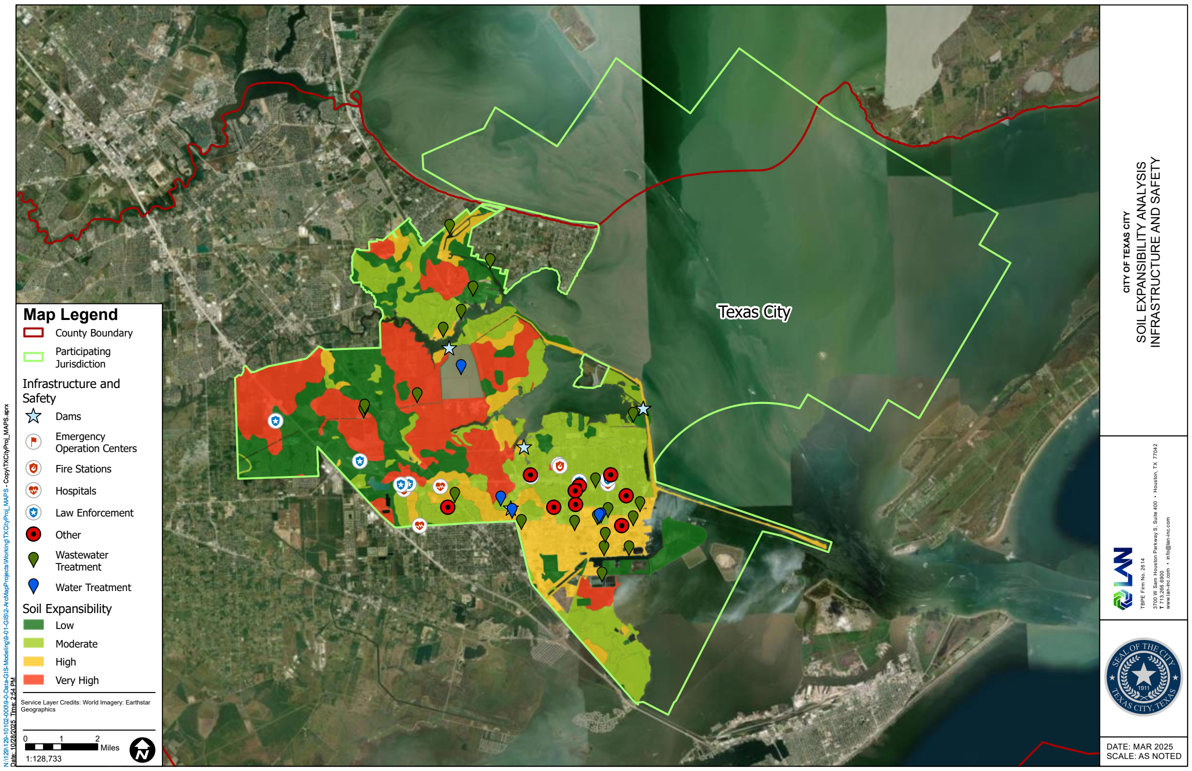


Figure 13-6. City of Texas City Soil Expansibility Hazard Map – (Education)

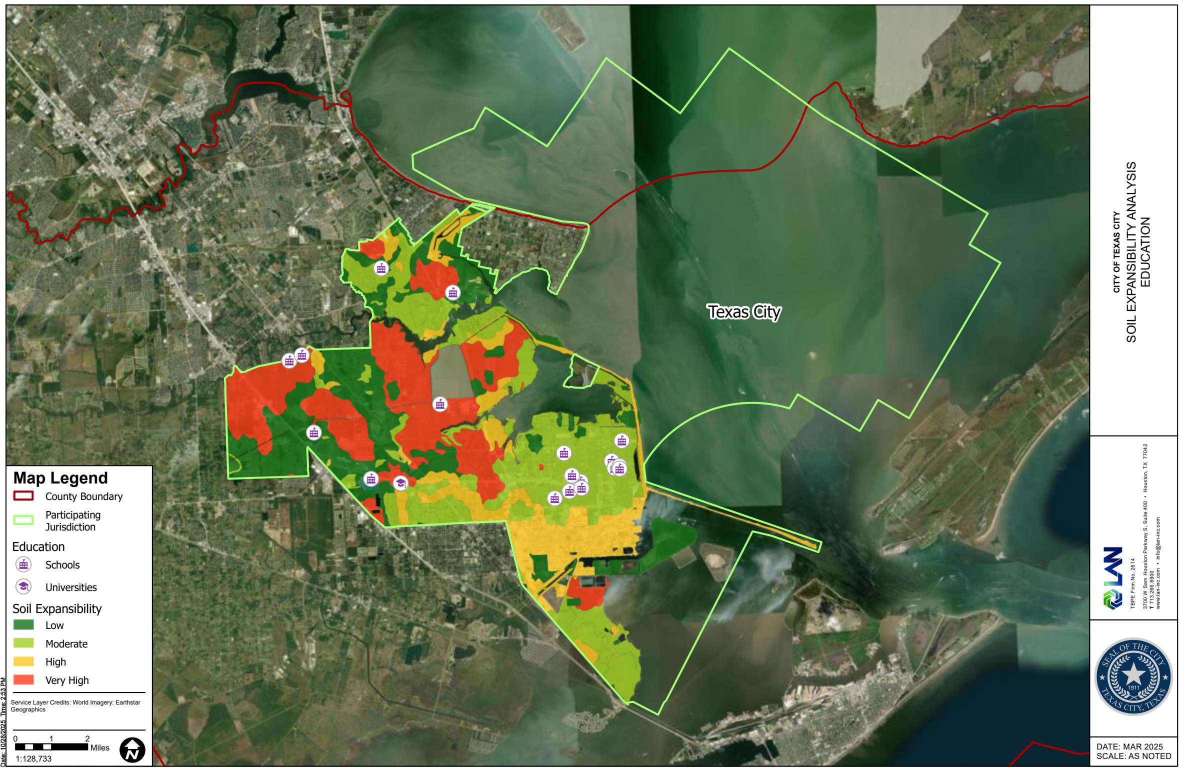
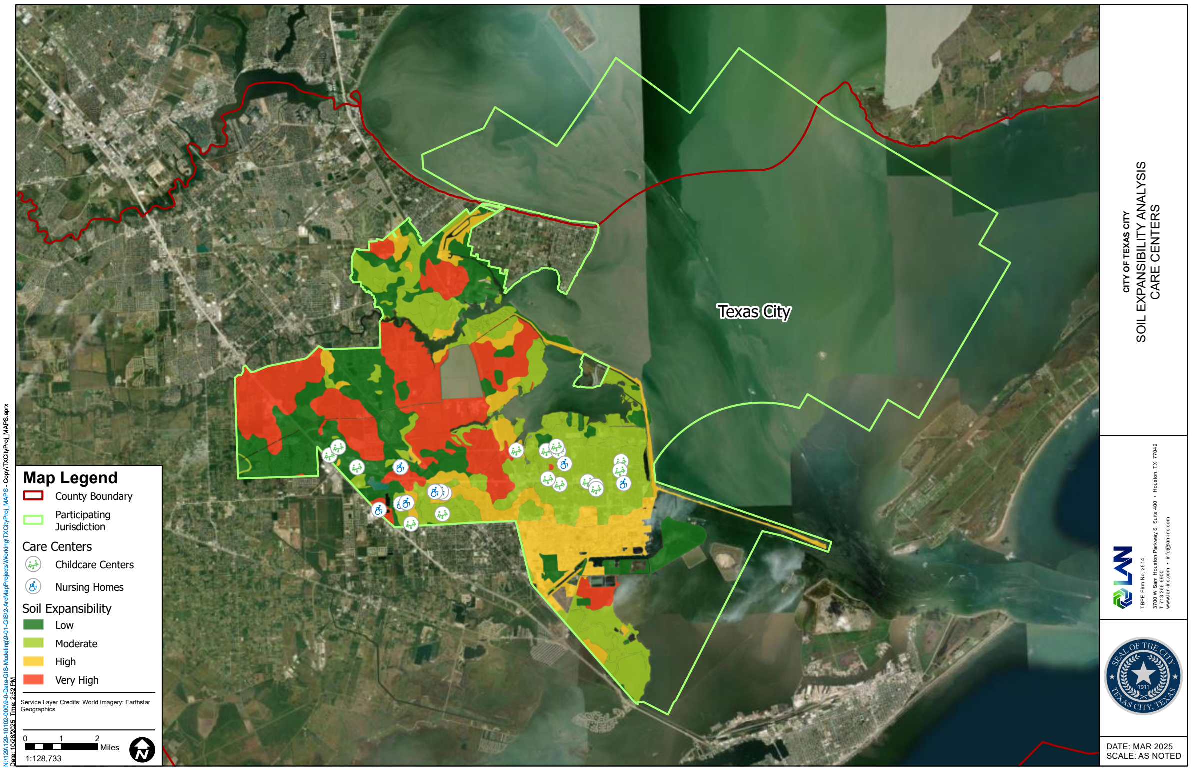


Figure 13-7. City of Texas City Soil Expansibility Hazard Map – (Care Centers)



Section 14: Dam and Levee Failure

Dam and Levee Failure Hazard Overview

Description

A dam is a barrier that is constructed to hold back water. A dam failure is a systematic failure of a dam structure resulting in the uncontrolled release of water, often resulting in floods that could exceed the 100-year flood plain boundaries.[1] A levee is an embankment built to prevent overflow from a body of water. A levee failure is when a levee embankment fails, or is intentionally breached, causing the previously contained water to flood the land behind the levee.

Locations

Dams

There are two dams located in the City of Texas City as indicated in Table 14-1 The locations of the dams located in and around the City of Texas City are shown in Figure 14-1. Locations impacted by dam failure are the areas downstream from the dams. These areas can expect a degree of inundation from flood waters, depending upon the severity of the dam failure. It is also possible that some areas upstream will be impacted by receding water levels, though these impacts are not likely to be damaging. Opportunities for recreation, irrigation, and industrial use may be reduced if reservoir water levels fall beneath their normal levels. The dams located in the City of Texas City are primarily used for drinking water reserves and storm water detention.

There is a general data deficiency for small dams and levees. Specific inundation maps do not exist for these structures. This data deficiency includes extent. Without inundation maps, extent cannot be measured. Actions to correct these data deficiencies are proposed in Section 17.

Levees

There are two levees, and one dike located in the City of Texas City as indicated in Table 14-2. The locations of these structures located in and around the City of Texas City are shown in Figure 14-1. Locations impacted by levee failure are the areas situated behind the levee walls. In the case of the Texas City Hurricane Levee, this is approximately 60% of the City’s land area. These areas can expect a degree of inundation from flood waters depending upon the levee height and the

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[1] The State of Texas Mitigation Plan, Updated 2023

severity of the levee failure. The National Levee Database, operated by the United States Army Corps of Engineers (USACE), provides inundation areas for the two levees surrounding the city.

Table 14-1. Dams Located in and Around the City of Texas City[2]

Dam Name	Primary Purpose	Owner	Drainage Area (sq mi)	Dam Height (ft)	Hazard Potential Classification	Storage (ac-ft)	
						Max	Normal
Galveston County Water Industrial Reservoir Dam	Water Supply; Other; Recreation	Gulf Coast Water Authority	1.27	14	High	9,462	6,931
GCWA Off Channel Term Stop Res Levee	Private Use	Gulf Coast Water Authority	0	8	Low	90	65

Table 14-2. Levees and Dikes Located in and Around the City of Texas City

Name	Flooding Source	Operator	Length	Hazard Potential Classification
Galveston County Industrial Water Reservoir Levee (Moses Lake Levee, Texas City Rainwater Levee)	Moses Lake	Texas City, TX	5.88 miles	High
Texas City - La Marque Hurricane Levee	Galveston Bay	USACE - Galveston District	22 miles	Very High
Texas City Dike	Galveston Bay	Texas City, TX	5.3 miles	None

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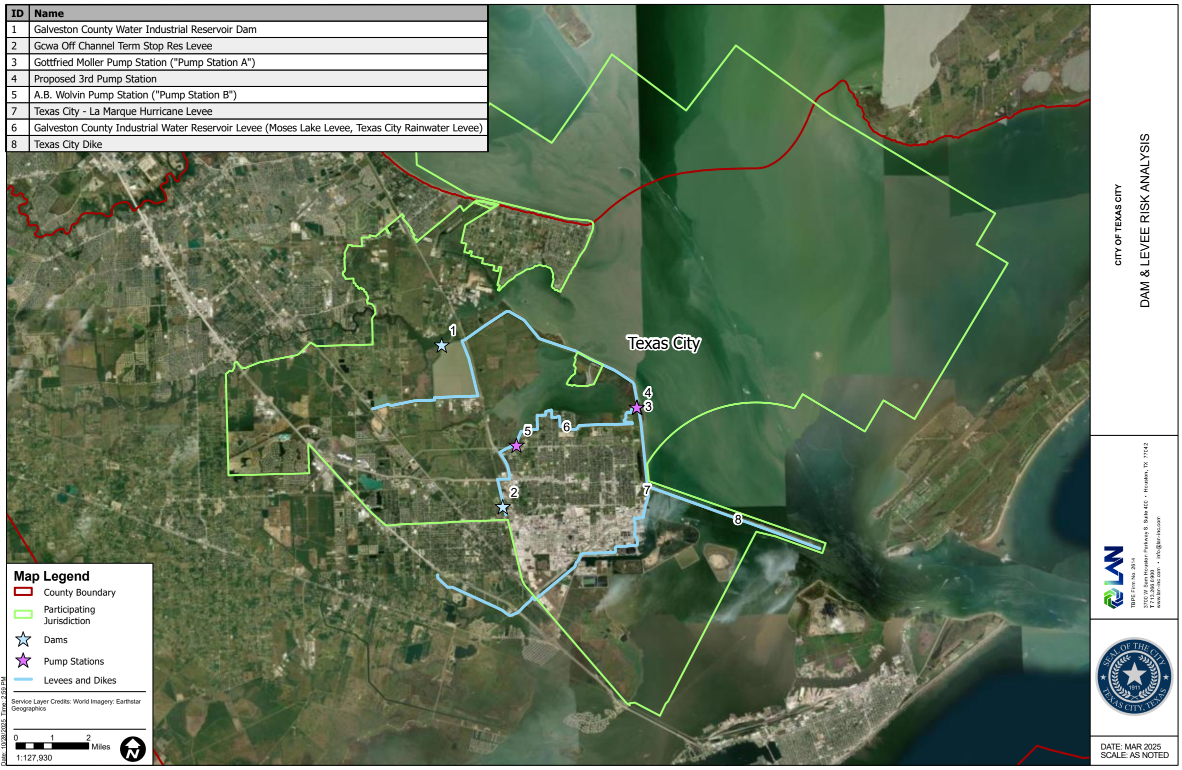
[2] Texas Commission on Environmental Quality and National Inventory of Dams from The United States Army Corps of Engineers

Figure 14-1: Map of Dams and Levees Located within and in proximity to the City of Texas City[3]



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[3] Texas Commission on Environmental Quality and National Inventory of Dams from The United States Army Corps of Engineers

Extent

The Federal Guidelines for Dam Safety (FEMA publication No. 333, dated April 2004) provides guidelines for determining the potential hazard classification for dams with "*the understanding that the failure of any dam or water-retaining structure, no matter how small, could represent a danger to the downstream life and property.*" The guideline establishes three classification levels of Low, Significant and High as indicated in Table 14-3.

Table 14-3: Dam Hazard Classifications

Hazard Classification	Loss of Life	Economic, Environmental, Lifeline Losses
Low	None Expected	Low and generally limited to owner
Significant	Possible, but not expected	Yes
High	Probable. One or more expected	Yes (but not necessary for this classification)

The Texas Emergency Action Planning website indicates that in 2005, the Texas Attorney General ruled that dam hazard classifications are exempt from disclosure under the state's Public Information Act due to Homeland Security concerns.

Dam failures can occur as a collapse or breach of the structure. Dam failures my result from one or more of the following conditions:

- Long periods of rainfall and flooding.
- Insufficient spillway capacity, resulting in embankment overtopping.
- Internal erosion caused by leaking or piping.
- Cathodic corrosion of concrete reinforcement.
- Maintenance problems, including failures in debris removal, repairs, or gate and valve maintenance.
- Poor design or construction.
- Dam failure upstream inundating the downstream dam.
- Erosion caused by wind-driven waves.
- Intentional sabotage.
- Land subsidence.
- Earthquakes.

A levee is a manmade embankment or structure built along a river, sea, or other body of water to protect the adjacent land from flooding. A levee failure is the systematic failure of the levee structure or levee system resulting in the uncontrolled release of water. The more common causes of levee failure include:

- Overtopping.
- Erosion.
- Structural Instability.
- Piping/under seepage.
- Settlement.[4]

FEMA requires that levees be certified to meet federal design, construction, maintenance, and operation standards to adequately reduce the risk of flooding from a major flood.

The State of Texas Hazard Mitigation Plan indicates that the "extent or magnitude of a dam failure event is described in terms of the classification of damages that could result from a dam's failure." The State plan also indicates that "specific dam names and additional identifying information are not included in this document as hazard classifications are considered confidential per Texas Government Code §418.181 and the Texas Attorney General."

Occurrences of:

Dam Failures

No previous occurrences of failure for dams affecting City of Texas City are known.

Levee Failures

No previous occurrences of failure for levees affecting City of Texas City are known.

Probability of:

Dam Failures

There is no history of failures for any of the dams that can affect the City of Texas City. It is assumed that a dam failure affecting the City of Texas City is unlikely within the next 10 years.

Levee Failures

There is no history of failures for any of the levees that can affect the City of Texas City. It must be noted, however, that the City of Texas City experienced record surge loading during Hurricane Ike. Portions of the Texas City Hurricane Flood Protection Levee were loaded to 100% of the levee's height. Any storm event which causes surge higher than that of Ike is expected to overtop the levee system, or even cause levee failure.

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[4] Congressional Briefing, FEMA, July 2013

Probabilities of future dam and levee failure events are also subject to the effect of future conditions, such as climate change. The effects of climate change include sea level rise, changes in weather patterns like drought and flooding, and much more. As long-term weather patterns and average temperatures change, so too will the locations, frequencies, and range of anticipated intensities of weather-related factors that contribute to dam and levee failure events, such as hurricanes, tropical storms, extreme rainfall events, sea levels, etc.

Impact of:

As climate change intensifies rainfall events and the population continues to grow in flood-prone areas, the risk of dam and levee failures becomes more critical. These structures protect large portions of the city from flooding, and their failure could result in catastrophic damage to homes, public buildings, and critical infrastructure. The growing population in Texas City will lead to increased development in areas protected by these structures, amplifying the potential for economic and human loss in the event of a failure. Investment in the maintenance and upgrade of dams and levees will be essential to prevent such disasters as climate impacts intensify.

Dam Failures

Dams provide benefits in the form of water for recreation, irrigation, human consumption (after treatment), industrial use, flood control, and hydroelectric power. Most dams contain relatively small volumes of water and do not pose a severe threat to downstream communities; however, a failure of a large dam could be catastrophic.

The Galveston County Water Industrial Reservoir Dam has a “High” hazard classification. This classification is evaluated, provided, and defined by the USACE. The USACE Dam Hazard Classifications may be found in Table 14-2. The dam has a max storage capacity of 9,462 acre-ft. The dam outfalls into Dickinson Bayou, which is upstream of Dickinson and Galveston Bay. The dam has a drainage area of 1.27 sq. mi. Currently, there are no inundation maps added to the National Inventory of Dams for the Galveston County Water Industrial Reservoir Dam.

The Gulf Coast Water Authority Off Channel Term Stop Reservoir Levee is also listed in the USACE’s National Inventory of Dams. This structure has a “Low” hazard classification, and a max storage capacity of 90 acre-ft. Currently, there are no inundation maps added to the National Inventory of Dams for the Gulf Coast Water Authority Off Channel Term Stop Reservoir Levee.

Of these two dams, the Galveston County Water Industrial Reservoir Dam is of the highest concern. The failure of this dam is expected to cause significant damage to residential/agricultural areas, displace vulnerable populations, and even result in the loss of life downstream of the dam. The failure of the Gulf Coast Water Authority Off Channel Term Stop Reservoir Levee is not expected to have as significant of an impact on the surrounding areas, and no loss of life should be expected. Unfortunately, the lack of dam failure inundation maps makes the quantification of expected damages difficult. Locations of dams in the planning area may be viewed in Figure 14-1. Based on this data and hazard classifications the impact of a dam failure in the City of Texas City is assumed to be high, due to the presence of a high capacity "High" hazard dam. If the City of Texas City's "Low" hazard dam were to fail, impacts are expected to be restricted to surrounding riparian corridors, agricultural areas, and to the dam itself. Failure of the "High" hazard, higher capacity dam may cause power outages, damage residential and commercial property, and displace vulnerable populations.

Levee Failures

Levees are designed to protect areas from flooding by acting as barriers to prevent water from overflowing into vulnerable land during periods of heavy rainfall or storm surge. They are commonly constructed along rivers, lakes, and coastal regions to safeguard residences, industries, businesses, agricultural land, and infrastructure. Levees also help prevent erosion. Depending on the size, the failure of a levee system could be catastrophic.

Out of all the dam and levee structures locates in and around the City of Texas City, the Texas City Hurricane Flood Protection Levee System poses the most risk upon failure. The levee was originally constructed in 1930, and last expanded in 1987. The entire system is 22 miles long, and consists of 20.6 miles of levees and 1.35 miles of flood walls. The average height of the levee is 20 feet. The USACE keeps records of the levee's historic loading by percentage of height. These occurrences may be seen on page 10. The risk associated with this levee is very high. Texas City and the surrounding areas experienced record storm surge levels during Hurricane Ike. These water levels loaded the levee to 100% capacity in some areas, with sections of the floodwall showing signs of movement. Any storm causing surge levels equal to or higher than that of Ike's is expected to overtop or cause the levee to fail. Failure of the Texas City Hurricane Flood Protection Levee System could result in localized flooding depths up to 15 feet. This flooding has a potential for loss of life, and economic damages to critical infrastructure including the internationally significant petrochemical industry. Nearly 60% of the City of Texas City lies within the expected inundation area of this levee.

The Galveston County Industrial Water Reservoir Levee System is located on the south bank of Moses Lake. The levee is 5.88 miles long, and serves to impede rising water levels in Moses Lake. The USACE does not publish data regarding this levee's average height, year of construction, or historic loading by percentage of height. Roughly 8% of the City of Texas City lies within this levee's projected inundation area.

Vulnerability

There is a general data deficiency for the dams in the planning area as dam-specific inundation maps do not exist for these dams. Consequently, it is difficult to develop a detailed vulnerability profile. Actions to correct these data deficiencies are proposed in Section 17.

Vulnerability to levee failure has been examined by looking at the population, property values, number of critical facilities, lengths of roadway and railroads, and acres of farmland located within each levee's inundation area as provided by the USACE.

City of Texas City Dam Failure Hazard

Location	Extent
See Figure 14-1	See Table 14-2

Occurrences	Probability
No historical dam failures	Dam Failure: 1% chance in next 10 years

Impact and Vulnerability
Low Hazard: Damage to dam and agricultural areas. High Hazard: Damage to dam, residential/agricultural areas, displaced populations, etc.

Despite the efforts of the planning team, inundation maps for the dams of the City of Texas City were not available. One "Low" hazard dam is present in the city. Failure of this dam is not expected to endanger critical facilities. Expected damages are restricted to nearby riparian corridors, agricultural areas, and the dam itself. The "High" hazard dam is located south of Dickinson Bayou. A failure of this dam can cause damage to the dam itself, residential/commercial/agricultural property, cause vulnerable populations to be displaced, destroy city infrastructure, and cause loss of life.

The City of Texas City Levee Hazard: Texas City Hurricane Flood Protection Levee System

LOCATION			EXTENT
Levee Name	**Major Flooding Source**	**Levee Height**	**Maximum Inundation Depth Upon Failure**
Texas City Hurricane Flood Protection Levee	Galveston Bay	20 feet	15 feet

EXTENT
The record storm surge experienced by the Texas City Hurricane Flood Protection Levee occurred during Hurricane Ike. Portions of the levee system were loaded to 100% of the levee's height. Any storm surge larger than Hurricane Ike's is expected to cause the levee system to fail, resulting in localized flood depths up to 15 feet.

OCCURRENCES AND PROBABILITY[5]				
Historic Loading by Percentage of Height	**Surge Height**	**Number of Recorded Instances**	**Future Event Likelihood**	**Recurrence Interval**
Overtopping	20 feet	0	1%	100 years
>75%	15 feet	1	2.6%	38 years
>50%	10 feet	5	13.2%	7.5 years
>25%	5 feet	9	23.7%	4 years

IMPACT & VULNERABILITY			
Population	**Residential Property Value[6]**	**Commercial Property Value**	**Industrial Property Value**
34,485	$2,043,042,362	$818,764,459	$8,425,242,210
Critical Facilities	**Roadway**	**Railroads**	**Farmland**
69	648.94 miles	26.73 miles	699.56 acres

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[5] National Levee Database

[6] Galveston County Appraisal District 2024 Parcels, GIS Data – Galveston Central Appraisal District

The City of Texas City Levee Hazard: Galveston County Industrial Water Reservoir Levee System

LOCATION			EXTENT
Levee Name	**Major Flooding Source**	**Levee Height**	**Maximum Inundation Depth Upon Failure (Feet)**
Galveston County Industrial Water Reservoir Levee System	Moses Lake	Data Not Available	Data Not Available

OCCURRENCES AND PROBABILITY[7]
No historic loading data available at this time

IMPACT & VULNERABILITY			
Population	**Residential Property Value[8]**	**Commercial Property Value**	**Industrial Property Value**
12,506	$907,148,146	$381,542,256	$131,133,120
Critical Facilities	**Roadway**	**Railroads**	**Farmland**
17	194.84 miles	5.07 miles	104.15 acres

The impacts of a complete failure of the Texas City levee system, it's likely that thousands of people, critical facilities, homes, and petrochemical facilities would be inundated. This flooding would cause severe disruptions to all activity within the inundated area. The density of industrial facilities creates the risk of severe environmental impacts from a levee failure. A failure of the Texas City levee system could potentially be catastrophic, with economic impacts felt across the nation.

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[7] National Levee Database

[8] Galveston County Appraisal District 2024 Parcels, GIS Data – Galveston Central Appraisal District

Figure 14-2. Map of Levee Inundation Areas for the City of Texas City (Infrastructure and Safety)

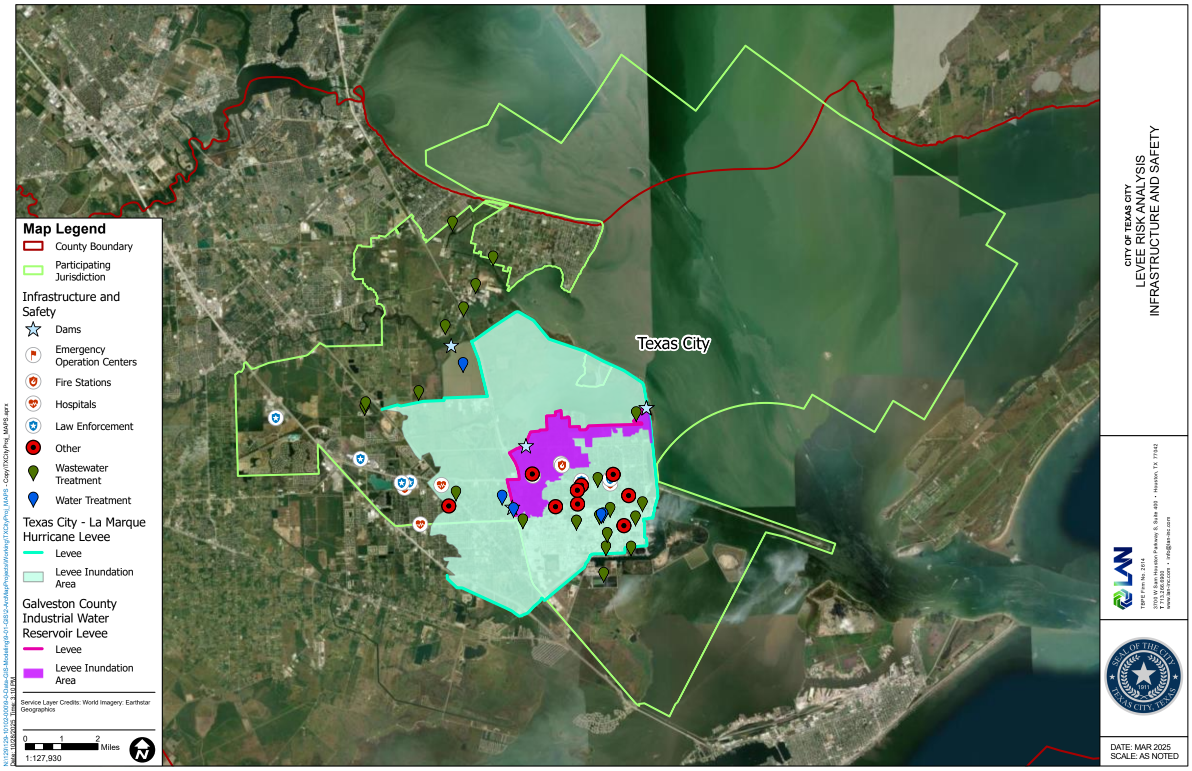


Figure 14-3. Map of Levee Inundation Areas for the City of Texas City (Education)

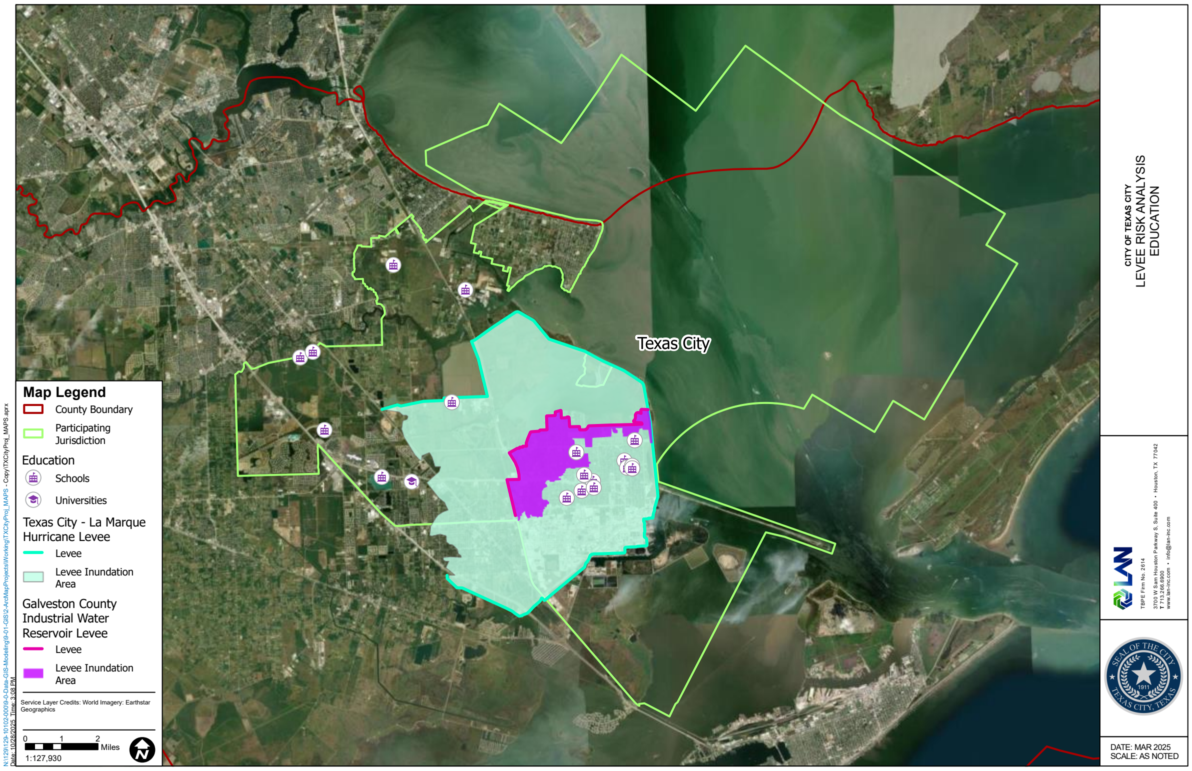
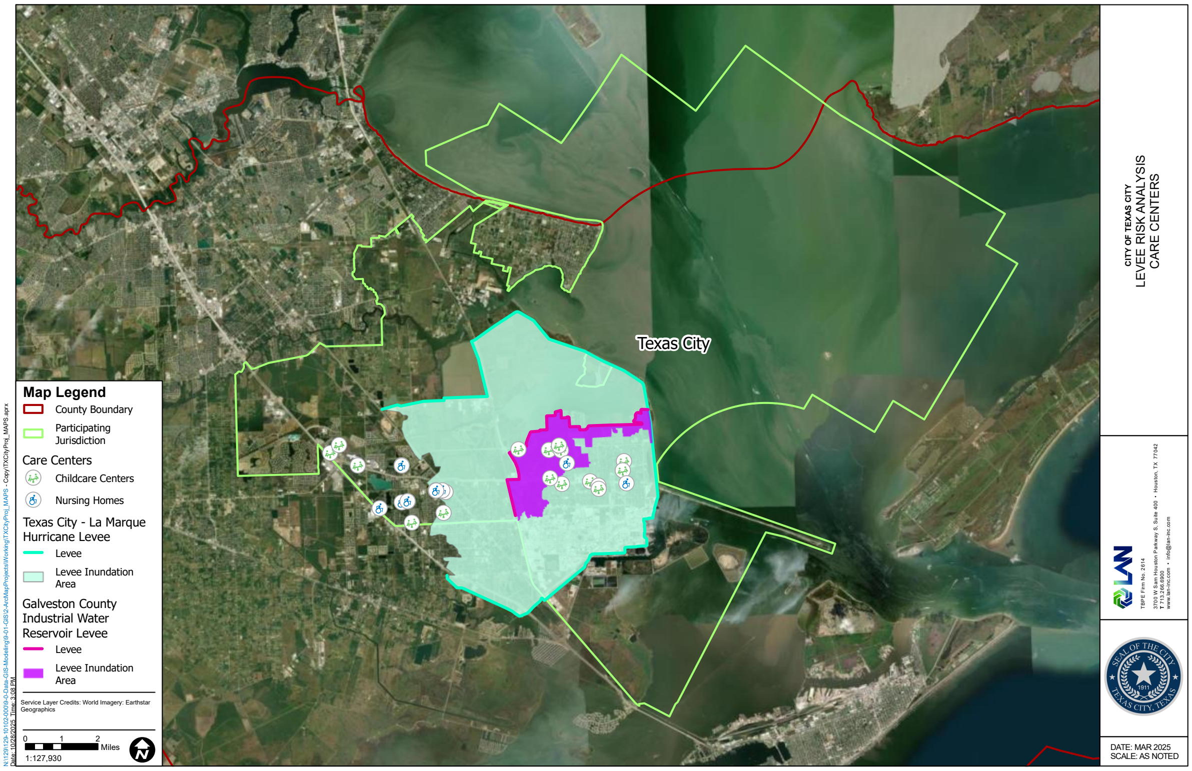


Figure 14-4. Map of Levee Inundation Areas for the City of Texas City

(Care Centers)



Section 15: Wildfire

Wildfire Hazard Overview

Description

A wildfire is an uncontrolled fire almost exclusively fueled by natural vegetative fuels. Fuel may come in the form of grass, brush, or trees. Wildfire risk increases with high concentrations of connected fuels. Meteorological conditions such as high temperatures, low humidity, droughts, and high wind can also increase wildfire risk. Humans are the most common source of initial ignition in wildfires. Sparks from agricultural, industrial, or automobile activity may start a wildfire.

Location

Wildfires are most common in areas where wildland and urban areas abut, known as the Wildland Urban Interface (WUI). The areas in the City of Texas City that feature WUI are the most vulnerable to wildfire. The urban centers of communities lack the concentrations of fuels required to feed wildfires. The rural areas of the planning area lack the degree of human activity that is associated with ignition. Areas where human activity takes place and where fuel concentrations and connectivity are sufficient to fuel wildfire are the areas where wildfires are most likely.

Extent

Risk to wildfire can be measured by using the Keetch-Byram Drought Index (KBDI). KBDI relates weather conditions and expected, potential fire behavior as shown in Table 15-1. KBDI is based upon daily water balance, precipitation, and soil moisture. KBDI ranges from 0 to 800. A KBDI score of 0 indicates no water depletion, while a score of 800 represents extremely dry conditions.

Table 15-1. KBDI Scores and Corresponding Potential Fire Behaviors

KBDI Value Range	Qualitative Drought Extent
0 - 200	Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. Typical of early spring following winter precipitation.
200 – 400	Fuels are beginning to dry and contribute to wildfire intensity. Heavier fuels will still not readily ignite and burn. This is often seen in late spring or early summer.
400 – 600	Lower litter and duff layers contribute to fire intensity and will burn actively. Wildfire intensity begins to increase significantly. Larger fuels could burn or smolder for several days. This is often seen in late summer and early fall.
600 – 800	Often associated with more severe drought with increased wildfire occurrence. Intense, deep-burning fires with extreme intensities can be expected. Live fuels can also be expected to burn actively at these levels

Galveston County has an average KBDI[1] of 380, minimum of 242, and maximum of 474. On average Galveston County has a low to moderate level of risk. Because KBDI indicates current conditions, care should be taken to ensure that KBDI is examined to determine risk. Droughts or extreme weather conditions may drive KBDI up or down in a short time.

Historically, the largest fire in the planning area (excluding controlled, fuel-management burns), based on TAMFS, was about 300 acres. In the future, the worst that is expected to occur in the City of Texas City is a fire size of 300 acres.

Extent may also be examined in terms of fire intensity. Table 15-2 provides the Texas A&M Forest Service Fire Intensity Rating. For future planning purposes, the City of Texas City can expect to experience a fire of Moderate to High intensity on the Texas A&M Forest Service Fire Intensity rating. The Wildfire Risk associated with the City of Texas City may be viewed in Figures 15-1 through 15-4.

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[1] Texas Weather Connection, https://twc.tamu.edu/kbdi

Table 15-2 – Texas A&M Forest Service Fire Intensity Rating

Texas A&M Forest Service Fire Intensity Ratings	
Intensity Rating	**Description**
Very Low	Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and nonspecialized equipment.
Low	Small flames, usually less than two feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
Moderate	Flames up to 9 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.
High	Large Flames, up to 40 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property
Very High	Very large flames up to 200 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

Occurrences

Records from the Texas A&M Forest Service (TAMFS) indicate that from January 2005 to February 2020, the range of dates for which spatial wildfire data is provided, the City of Texas City experienced a total of 6 wildfires. Half of these wildfires were equal to 1 acre, and the other half were equal to or greater than 50 acres resulting in a total burned area of 553 acres. TAMFS records indicate that debris burning, and miscellaneous or unknown causes account for all six fires. Records of occurrence are provided in the summary table, and a partial list is provided in Table 15-3, using TAMFS data. These record locations may be viewed in Figures 15-1 through 15-4.

Due to the wide-ranging variability in wildfire data, the Galveston County data provided by the Texas A&M Forest Service is used to calculate the City of Texas City hazard probability. This dataset is the most detailed available, and therefore most suited for analysis.

Table 15-3 Historical Wildfire Occurrences[2]

Start Date	Acres Burned	Cause	Sub-Cause/Narrative
12/12/2010	200	Miscellaneous	Other
12/12/2010	300	Miscellaneous	Other
2/12/2011	50	Miscellaneous	Other
6/2/2011	1	Debris burning	Pasture and field burning (including grass, crop residues)
6/18/2011	1	Debris burning	Pasture and field burning (including grass, crop residues)
9/16/2011	1	Debris burning	Pasture and field burning (including grass, crop residues)

Probability

Hazard probability or reoccurrence intervals are calculated based upon the number of historical events during the period of examination. For example, if four wildfires were to have taken place during a 50-year reporting period, the reoccurrence interval would be about 12.5 years, or an 8% annual chance of wildfire. Probabilities are shown below in the summary table.

Probabilities of future wildfire events are also subject to the effect of future conditions, such as climate change. The effects of climate change include sea level rise, changes in weather patterns like drought and flooding, and much more. As long-term weather patterns and average temperatures change so too will the frequencies and range of anticipated intensities of wildfires. While the majority of wildfires in Galveston County are manmade, the conditions brought by climate change may lead to larger, more intense, and harder to control wildfires. Climate change is expected to increase the frequency and intensity of wildfires in Texas, and Texas City will not be immune. Drier conditions and higher temperatures will raise the risk of wildfires, particularly on the outskirts of the city where development is expanding into more fire-prone areas. Public infrastructure, including roads, power lines, and water systems, could be damaged or disrupted by wildfires, affecting access to critical services. As Texas City's population grows, more people will live in areas vulnerable to wildfire, increasing the potential for loss of life and property. Fire-resistant infrastructure and effective land management practices will be crucial to reducing these risks.

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[2] Texas A&M Forest Service, 2023

Impact

The impact of wildfire is described in terms of property exposure. Data from the Texas A&M Forest Service are examined to determine residential and commercial property exposure to high wildfire risk areas. The Texas A&M Forest Service data are described in greater detail in the Vulnerability section.

Vulnerability

Vulnerability and impact to wildfire is discussed in terms of asset exposure from “low” to “very high” wildfire threat. The wildfire threat data comes from the Texas A&M Forest Service and is a unitless index ranging from 1 to 7. The TAMFS assigns the qualitative descriptions of Low (1 & 2), Moderate (3 & 4), High (5 & 6), and Very High (7).

It should be noted that the wildfire threat index is a model. Wildfires have taken place outside of areas of high risk. Conversely, there are areas of high risk that have never experienced a wildfire. When interpreting wildfire risk exposure as described by the wildfire threat model, it is important to realize that no model will ever completely capture the variability of the real world.

Pastoral and crop lands have the potential to be impacted by wildfire. Crops and pastures can become fuel for wildfires. Wildfires that do not pose a direct threat to human lives or safety can still be damaging due to their impacts on economies dependent upon crop or livestock production. The 2023 National Land Cover Database (NLCD) dataset was used to calculate pasture and crop area in the City of Texas City.

City of Texas City Wildfire Hazard

LOCATION
Primarily rural areas

EXTENT[3]			
Sources of Ignition	**Number of Ignitions**	**Maximum Single Fire Acreage**	**Total Burned Acreage**
Debris Burning	3	1	3
Miscellaneous	3	300	550
TOTAL:	**6**	**300**	**553**

OCCURRENCES		
Total Number of Fires (2008-2020)	**Risk to Health and Safety[4]**	**Property Damage**
6	0 deaths, 0 injuries	$0

PROBABILITY	
Future Wildfire Events Likelihood	**Recurrence Interval**
50% annual chance	1 fire every 2 years

IMPACT		
Wildfire Risk	**Residential Property Risk[5]**	**Non-Residential Property Risk***
Very Low	$8,495,070	$15,631,695
Low	$35,438,290	$2,157,940
Moderate	$481,547,805	$753,154,776
High	$228,947,634	$710,806,265
Very High	$77,268,105	$55,147,921

VULNERABILITY			
People at Risk[6]	**Crop Land (Acres)[7]**	**Roadway (Miles)**	**Railroad (Miles)**
43,862	10,269	408	33

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[3] Texas A&M Forest Service, 2025

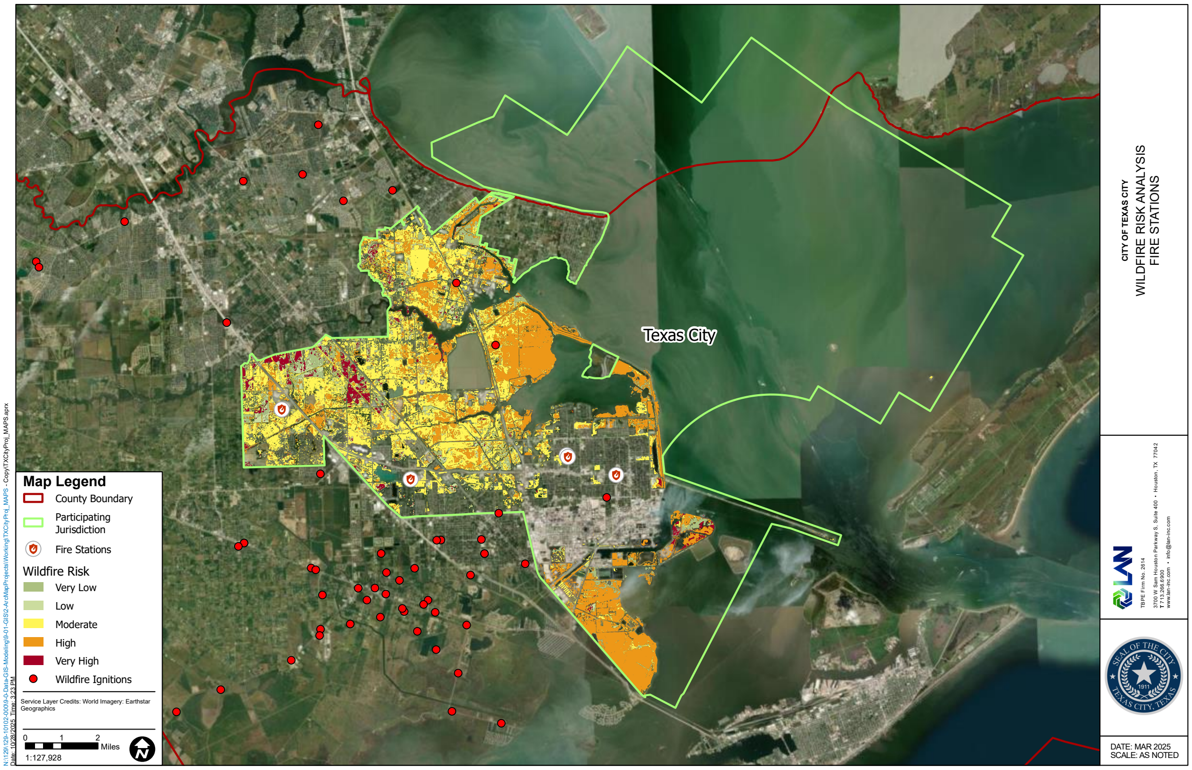
[4] NCDC Wildfires Database, 2025

[5] Galveston County Appraisal District 2024 Parcels

[6] Census Bureau Population Estimate, 2022

[7] 2023 Annual NLCD, Data | Multi-Resolution Land Characteristics (MRLC) Consortium

Figure 15-1. Fire Locations / Origins and Wildfire Threat Index for the City of Texas City[8]



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[8] Texas A&M Forest Service, 2025

Figure 15-2. Fire Locations / Origins and Wildfire Threat Index for the City of Texas City - (Infrastructure and Safety)

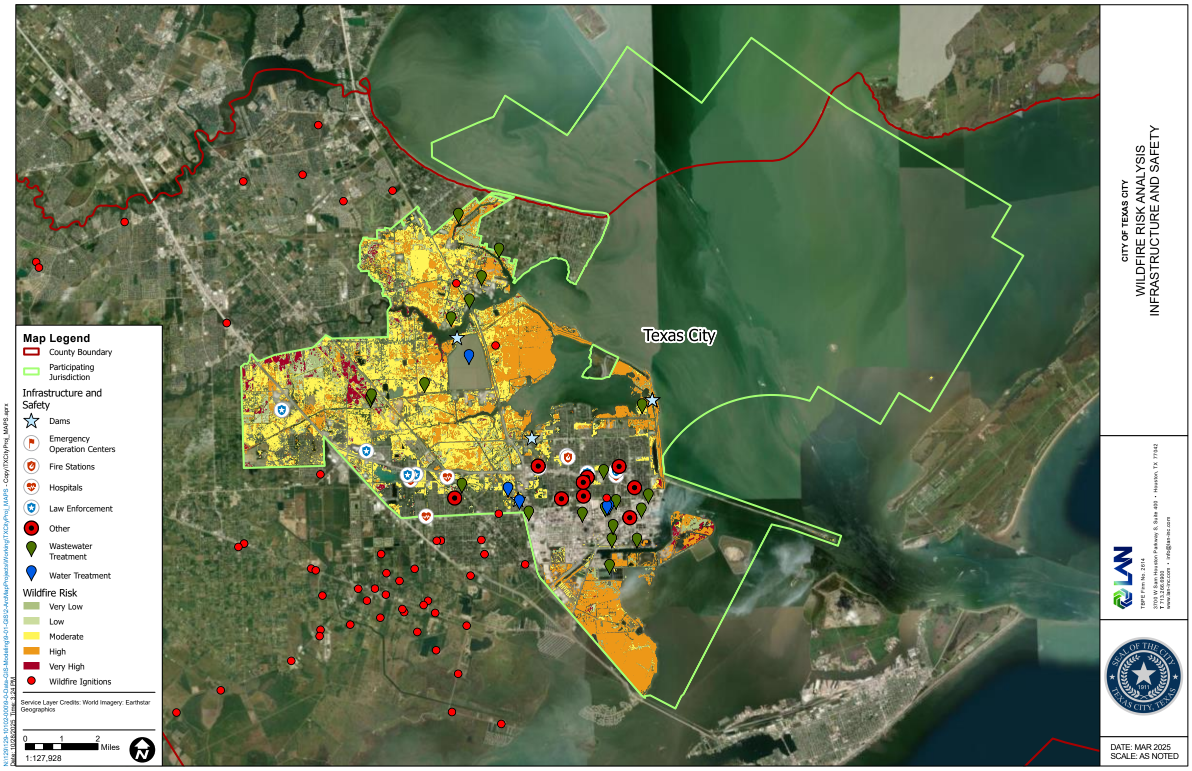


Figure 15-3. Fire Locations / Origins and Wildfire Threat Index for the City of Texas City - (Education)

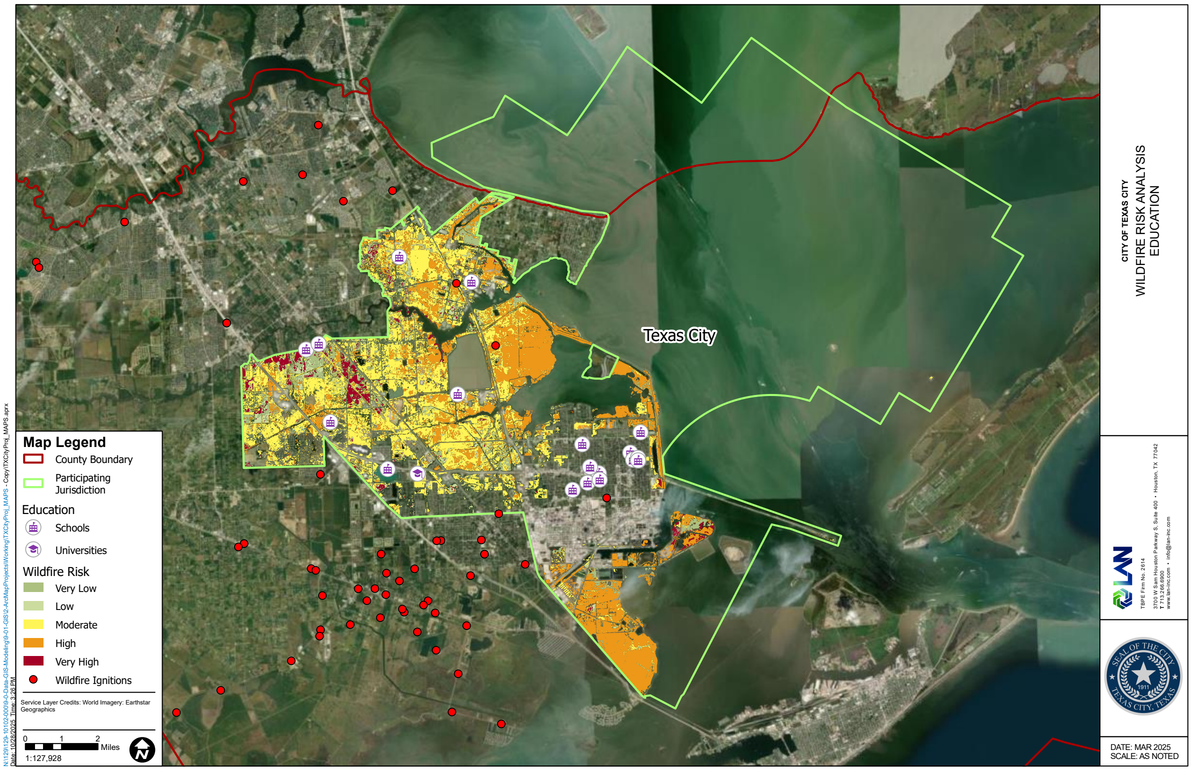
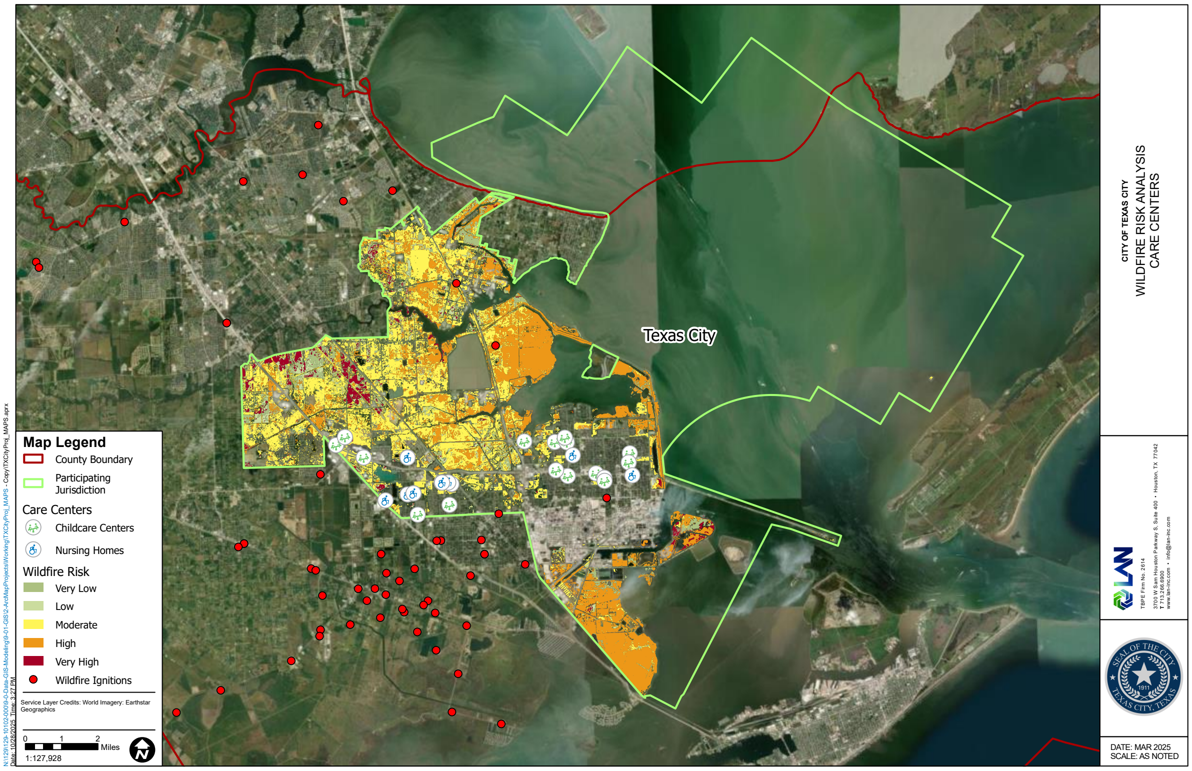


Figure 15-4. Fire Locations / Origins and Wildfire Threat Index for the City of Texas City - (Care Centers)



Section 16: Severe Winter Storms

Severe Winter Storms Hazard Overview

Description

A severe winter storm event is defined as a storm with snow, ice, or freezing rain. Severe winter storms are rare for the Southern Texas area. Severe winter storms may include snowstorms, blizzards, cold waves, and ice storms. Snowstorms include four or more inches of snow in a 12-hour period. Blizzards are characterized by low temperatures and strong winds in excess of 35 mph with large amounts of drifting snow. A cold wave is a winter cold front with a drastic drop in temperature. An ice storm occurs when rain falls out of the warm and moist upper layers of the atmosphere into a cold and dry layer near the ground.[1]

Location

Winter storms vary in location, intensity and duration but are considered rare occurrences in the City of Texas City. Winter storms have the capability to affect the entire planning area

Extent

Table 16-1 below displays the various extents of different types of severe winter storms. Table 16-2 describes the historic low temperatures and amounts of snow experienced by the City of Texas City. Wind−chill factor is described in Figure 16−1. This is an index developed by the National Weather Service, although the chart is not applicable when temperatures are over 50˚ or winds are calm.

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[1] State of Texas Mitigation Plan Update 2023

Table 16-1. Extent Scale - Winter Weather Alerts

Alert Type	Description
Winter weather advisory	This alert may be issued for a variety of severe conditions. Weather advisories may be announced for snow, blowing or drifting snow, freezing drizzle, freezing rain, or a combination of weather events.
Winter storm watch	Severe winter weather conditions may affect your area (freezing rain, sleet or heavy snow may occur separately or in combination).
Winter storm warning	Severe winter weather conditions are imminent.
Freezing rain or freezing drizzle	Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.
Sleet	Small particles of ice usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.
Blizzard warning	Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted.
Frost/freeze warning	Below freezing temperatures are expected and may cause significant damage to plants, crops and fruit trees.
Wind chill	A strong wind combined with a temperature slightly below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere. The combined cooling power of the wind and temperature on exposed flesh is called the wind–chill factor.

Table 16-2 Historical Extents

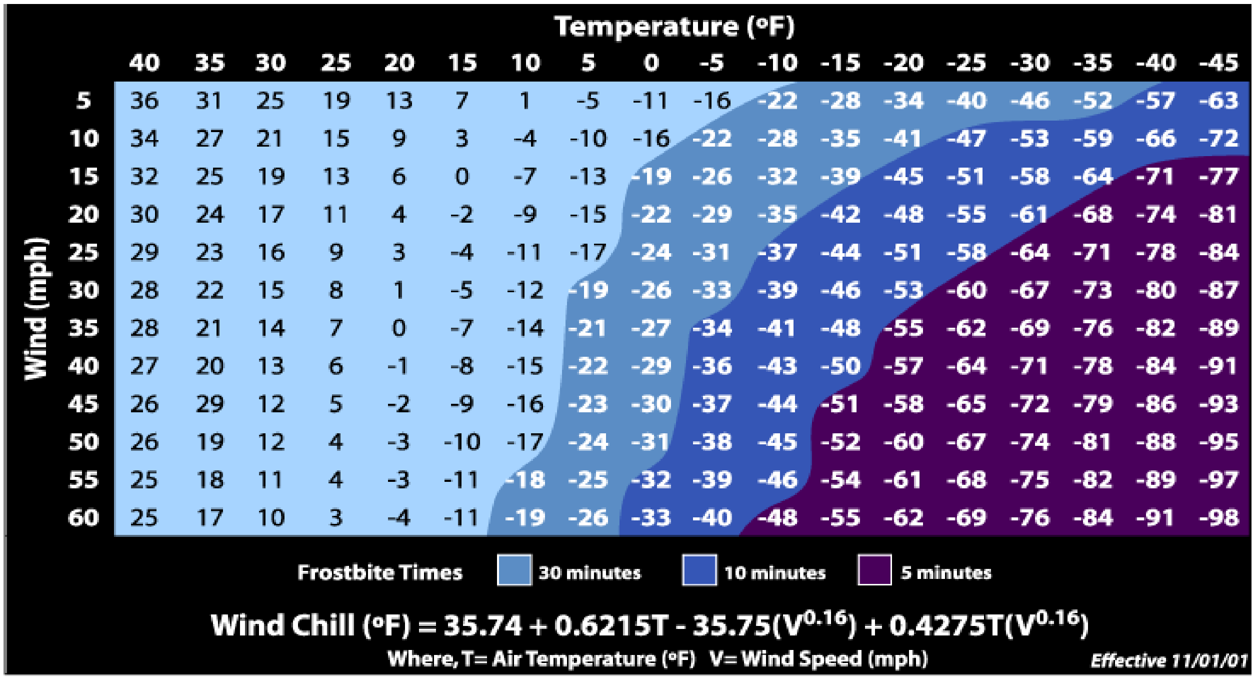
Record Low Temperature (°F)	Record Snowfall (inches)
5°	3″

*Records are limited by the presence of a National Weather Service weather station within the planning area.

Wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body, similar to the heat index for extreme heat (Figure 16–1). Since wind can dramatically accelerate heat loss from the body, a blustery 30˚F Day would feel just as cold as a day with temperatures around 0˚F. The City of Texas City has never experienced a blizzard, but the region has been subject to ice storms, heavy snow, ice storm, winter weather, and cold/wind chill. Historic low temperatures and snowfall amounts have been recorded in Table 16-2.

Based upon historical data, the worst that can be expected in the future in the planning area is 3 inches of snow and a temperature of 5° F. Wind chill factors would further lower the apparent temperature, potentially as low as -26 degrees.

Figure 16-1. Wind Chill Chart[2]



	Temperature (°F)																	
Wind (mph)	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	29	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times ▨ 30 minutes ▨ 10 minutes ▨ 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

Occurrences

Severe winter storm events in the City of Texas City are rare. December to February are the months when snow, sleet or freezing rain are most likely to be observed; yet winter weather conditions can occur at any time during the winter and early spring months. Table 16-3 shows historical occurrences for the area since 1997, as well as the type of event and the amount of damage provided by the National Climatic Data Center (NCDC). Although there have been relatively few storms, it is likely that several occurrences have gone unreported. The NCDC has nine reported deaths among these events.

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[2] NOAA

Table 16-3. Historical Winter Storm Events, 1997-2024[3]

Date	Event Type	Fatalities	Injuries	Property Damage	Crop Damage
1/12/1997	Ice Storm	0	0	0	0
12/24/2004	Heavy Snow	0	0	0	0
2/3/2011	Ice Storm	0	0	0	0
12/8/2017	Winter Weather	0	0	0	0
2/15/2021	Cold/Wind Chill	9	0	$12,000,000	0

Probability

Hazard probability or reoccurrence intervals are calculated based upon the number of historical events during the period of examination. For example, for five Winter Storm events that have taken place during a 27-year reporting period, the reoccurrence interval would be about 5.4 years, or an 18.52% annual chance of a winter storm event. This indicates an event is somewhat likely in the next five years. Probabilities of winter storm events are also subject to the effect of future conditions, such as climate change. The effects of climate change include sea level rise, changes in weather patterns like drought and flooding, and much more. As long-term weather patterns and average temperatures change so too will the frequencies and range of anticipated intensities of winter storm events. Climate change could lead to more erratic and extreme weather patterns, including unexpected cold snaps. When winter storms occur, they can cause significant disruption to public infrastructure, including roads, power lines, and water systems, leading to power outages, burst pipes, and dangerous travel conditions. Population growth will increase the demand for emergency services and heating during such events, and expanding development may place more infrastructure at risk from freezing temperatures. Ensuring that buildings and utilities are better insulated and prepared for extreme cold will be necessary to minimize the impacts of future winter storms.

Impact

Winter storms are associated with freezing or frozen precipitation such as freezing rain, sleet, snow and the combined effects of winter precipitation and strong winds. Wind chill is a function of temperature and wind. Low wind chill is a product of high winds and freezing temperatures. The leading cause of death during winter storms is transportation accidents. Hypothermia and frostbite are other dangers from very cold winter temperatures.

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[3] NCDC Storm Events Database, https://www.ncdc.noaa.gov/stormevents/

Historical evidence shows that most of the area has a low risk of winter storm activity; however, past reported property damages indicate that, while winter events (typically consisting of snow and ice) do occur, their economic impacts are typically not severe across the entire study area. All buildings and facilities are considered to be exposed to this hazard and could potentially be impacted because it cannot be predicted where a winter storm event may cause damage or disruption. The agricultural industry in the City of Texas City is not usually affected by winter storms as crops are not usually planted during the winter months.

Vulnerability

Winter storm vulnerability in the planning area is widespread and has the potential to affect all assets and residents. Vulnerabilities in the planning area are exacerbated by existing vulnerabilities from other hazards in the HMP. Winter storms in the City of Texas City pose an annual reoccurrence chance of 18.52%. All residential, commercial, and agricultural assets within the planning area are vulnerable which can result in direct structural and social damages. Critical facilities are vulnerable in the planning area. Schools, emergency operations centers, fire stations, dams, hospitals, water treatment plants, and wastewater treatment facilities are all examples of the critical facilities at risk.

The ability of winter storms to affect the planning area at the household level further disrupts economic and social trends by increasing energy consumption for heating sources, increasing household fire risk, impede police and firefighting efforts, and posing structural damages to pipes not fitted for winter storm temperatures.

City of Texas City Severe Winter Storms Hazard

LOCATION
City Wide

OCCURRENCE	EXTENT				
Number of Events 1997-2024	Frost/Freeze	Winter Weather	Ice Storm	Heavy Snow	Cold/Wind Chill
5	0	1	2	1	1

PROBABILITY			
Number of Events 1997-2024	Record Time Period	Time Period Years	Probability
5	1997 to 2024	27	1 extreme winter event estimated every 5.4 years

IMPACT				
Number of Events	Deaths	Injuries	Property Damage	Crop Damage
5	9	0	$12,000,000	Negligible

VULNERABILITY				
Population (City)[4]	Property Value[5]		Crop Land	
	Commercial	Residential	Acres[6]	Value
53,084	$1,279,967,437	$3,479,490,151	11,819	$438,411,673

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[4] U.S. Census Bureau. "ACS Demographic and Housing Estimates." *American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP05*, 2022, https://data.census.gov/table/ACSDP5Y2022.DP05?q=texas city.

[5] Galveston County Appraisal District 2024 Parcels, GIS Data – Galveston Central Appraisal District

[6] 2023 Annual NLCD, Data | Multi-Resolution Land Characteristics (MRLC) Consortium

Section 17: Mitigation Actions

Mitigation Strategy

The Planning Team reviewed the goals and objectives from the Previous Pre-Disaster Mitigation Plan and Hazard Analysis. Mitigation actions, new and old, are prioritized to reflect overall mitigation strategy, which is to reduce and eliminate the long-term risk of loss of life and property damage from the full range of disasters affecting the planning area. Each mitigation action is presented in the section below. The planning team prioritized actions by weighing how much each action would reduce risk, how practical it would be to implement, and a rough estimate of cost-effectiveness. The planning team also used public comments to prioritize mitigation actions. Finally, every action has been updated to reflect the plan's current approval status, expiration dates, and any recent amendments, so the list stays both technically sound and aligned with community concerns.

The City of Texas City has multiple authorities to implement the mitigation strategy. Authority includes, but is not limited to, local planning and zoning, public works efforts, emergency management, tax authority, annual operation budgets, building codes and ordinances. The City of Texas City participates in the NFIP. General hazard mitigation goals are defined below.

Goal 1

Protect public health and safety.

Objective 1.1

Implement mitigation actions that will assist in protecting lives and property by making homes, businesses, public facilities, and infrastructure more resistant to hazards.

Objective 1.2

Maximize the utilization of the latest technology to provide adequate warning, communication, and mitigation of hazard events.

Objective 1.3

Reduce the danger to, and enhance protection of, high risk areas during hazard events.

Objective 1.4

Ensure that public and private facilities and infrastructure meet established building codes and enforce the codes to address any deficiencies.

Goal 2

Protect new and existing properties.

Objective 2.1

Reduce repetitive losses to the National Flood Insurance Program (NFIP).

Objective 2.2

Use the most cost-effective approach to protect existing buildings and public infrastructure from hazards.

Objective 2.3

Review existing ordinances, building codes, and safety procedures and enforce regulatory measures to ensure they protect lives and property.

Goal 3

Build and support partnerships to enhance mitigation to continuously become less vulnerable to hazards.

Objective 3.1

Build and support local partnerships to continuously become less vulnerable to hazards.

Objective 3.2

Build a cadre of committed volunteers to safeguard the community after a disaster.

Objective 3.3

Build hazard mitigation concerns into planning and budgeting processes.

Goal 4

Leverage outside funds for investment in hazard mitigation.

Objective 4.1

Maximize the use of outside sources of funding to help communities with local match requirements for implementing hazard mitigation actions to reduce risk.

Objective 4.2

Maximize participation of property owners in protecting their properties.

Objective 4.3

Maximize insurance coverage to provide financial protection against hazard events.

Objective 4.4

Prioritize mitigation projects based on cost-effectiveness, starting with those sites facing the greatest threat to life, health and property.

Goal 5

Increase the understanding of residents for the need for mitigation, and steps they can take to protect people and properties.

Objective 5.1

Heighten public awareness of the full range of natural and man-made hazards they face.

Objective 5.2

Educate the public on actions they can take to prevent or reduce the loss of life or property from all hazards.

Objective 5.3

Publicize and encourage the adoption of appropriate hazard mitigation measures.

Mitigation Action Status Update

Mitigation actions included in the previous hazard mitigation plan continue to be relevant and are included along with new mitigation actions in Hazard Mitigation Plan update. The communities' priorities have not changed. Mitigation actions from the previous Hazard Mitigation Plan are presented in the tables titled (Previous Plan Mitigation Actions); new mitigation actions will be presented in the tables titled (New Mitigation Actions). Many of the hazard mitigation actions from the previous hazard mitigation plan remain active due to the need for annual implementation or long-term project timelines. Mitigation Actions that are completed have been updated with the action completion date in the timeline field. Since the last version of the plan was approved, in 2019, there has been no incorporation of the mitigation plan into other planning mechanisms.

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
Moses Lake Floodwater Pump Station - Rainwater Pump Station A - Construct a flood water pump station that would be capable of pumping 375,000 gallons per minute out of Moses Lake directly into Galveston Bay. Pump Station would be located on or near the USACE Hurricane levee. The pump station would consist of a battery of six (6) direct-drive diesel-powered axial flow pumps situated inside the Hurricane levee. Each pump would have a dedicated suction and discharge line, taking suction from Moses Lake and discharging over the Hurricane levee into Galveston Bay, onto an erosion control structure. The project would include a control building, power to the site, diesel storage tanks, and access driveways.	Flooding, Hurricane/Tropical Storm	High	$22,000,000.00 City Funds, FEMA Mitigation Grant Funds	Public Works, Engineering, and Emergency Management	Structural	Protects new and existing buildings by improving flood management through the construction of a pump station that efficiently removes floodwater from Moses Lake, reducing flood risks in surrounding areas.	Still relevant, this project has been funded; however, it has not been started due to delays by the Army Corp of Engineers. Keep in the 2025 plan.
Rainwater Pump Station A Capacity Improvements- Improve flood control by increasing the maximum pumping rate of Rainwater Pump Station A. Presently, all rainwater in the levee-protected areas of the City must pass through either Pump Station A or Pump Station B. Pump Station A has a capacity of 375,000 gallons per minute, while Pump Station B has a capacity of 625,000 gallons per minute. By increasing the capacity of Pump Station A, the City will be able to maintain lower flood	Flooding, Hurricane/Tropical Storm	High	$9,000,000 - City Funds, FEMA Mitigation Grant Funds	Public Works, Engineering, Emergency Management	Structural	Protects new and existing buildings by increasing the pumping capacity of Rainwater Pump Station A, reducing floodwater elevations and minimizing the	Keep in the 2025 plan

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
water elevations in the City, thereby reducing structural flooding.						risk of structural flooding in the City.	
Southpointe Subdivision Drainage Improvements - Implement adequate provisions to reduce or eliminate standing water in existing buildings. Improvements may include wider drainage systems and increased size in culverts, etc. Identify drainage areas in need of increased culverts or widening and set priorities for developing funding requests and implementation of construction.	Flooding, Hurricane/Tropical Storm	High	$3,000,000 Office of Rural Community Affairs, Hazard Mitigation Grant Program, Pre-Disaster Mitigation Grant Program,406 Public Assistance Program(following federal disaster declaration), Us Army Corps of Engineers-Small Flood Control Projects, USDA Natural Resources Conservation Service-Emergency	Public Works, Emergency Management	Property Protection	Reduces flooding risk to new and existing buildings by improving drainage systems and increasing culvert sizes, preventing standing water and minimizing structural damage.	Keep in 2025 plan

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
			Watershed Protection Agency, Texas Water Development Board(Development Fund II)- Texas Water Development Fund, USDA Natural Resources Conservation Service- Watershed Protection and Flood Prevention Program, EPA- Non point Source Grant Program				
Amburn Park Drainage Improvements - Reduce structural flooding in the Amburn Park area of the City by increasing stormwater conveyance by means of storm sewers, channels, inlets, improving surface drainage flow patterns, and providing stormwater detention. During Hurricane	Flooding, Hurricane/Tropical Storm	High	$3,000,000 - Office of Rural Community Affairs, Hazard Mitigation Grant Program, Pre-Disaster Mitigation Grant Program,406	Public Works, Emergency Management	Property Protection	Reduces flooding risk to new and existing buildings in the Amburn Park area by improving stormwater conveyance,	Complete

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
Harvey, a large number of homes in this area experienced structural flooding.			Public Assistance Program(following federal disaster declaration), Us Army Corps of Engineers-Small Flood Control Projects, USDA Natural Resources Conservation Service-Emergency Watershed Protection Agency, Texas Water Development Board(Development Fund II)-Texas Water Development Fund, USDA Natural Resources Conservation Service-Watershed Protection and Flood Prevention			surface drainage, and providing detention, minimizing the potential for structural flooding during future storms.	

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)							
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
			Program, EPA-Nonpoint Source Grant Program.				
Delany Lake #2 Stormwater Pump Station - Improve flood control by reducing flood water surface in Delaney Lake. Delany Lake is utilized as a stormwater detention basin, but due to the nearly flat terrain of the area has a very limited outfall capacity. Adding a pump station would allow the City to maintain a lower normal water level in the lake, thereby providing additional detention volume, and would allow an increase in outfall rate out of the pond for the purpose of reducing structural flooding in the area.	Flooding, Hurricane/Tropical Storm	High	$2,000,000 - City Funds, FEMA Mitigation Grant Funds	Public Works, Engineering, Emergency Management	Structural	Protects new and existing buildings by reducing flood risks through the addition of a stormwater pump station.	Still relevant - Leave in 2025 plan
Storm Sewer Trunk Main Improvements - 7th Ave., Logan Street to Outfall - Rehabilitate or replace a deteriorated underground storm sewer trunk main that is heavily deteriorated and undersized. The project would reduce structural flooding and street flooding.	Flooding, Hurricane/Tropical Storm	High	$13,000,000.00 - Office of Rural Community Affairs, Local Funds, US Army Corps of Engineers-Small Flood Control Projects, USDA Natural Resources Conservation Service-	Public Works, Emergency Management	Structural	Reduces flooding risks to new and existing buildings by rehabilitating or replacing the deteriorated storm sewer trunk main, improving stormwater flow and preventing	Completed

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)							
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
			Emergency Watershed Protection Agency, Texas Water Development Board-Clean Water State Revolving Fund, Texas Water Development Board (Development Fund II)-Texas Eater Development Fund, USDA Natural Resources Conservation Service-Watershed Protection and Flood Prevention Program, EPA-Non-point Source Grant Program, 406 Public Assistance Program			structural and street flooding.	

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
			(following federal disaster declaration), HMGP, PDM Grant Program (FEMA)				
Storm Sewer Improvements - 21st St. Basin, 10th Ave. to Loop 197 - Reduce structural flooding and street flooding in the areas of 21st Street and 23rd Street, between 10th Avenue and Loop 197 North. The area floods frequently due to undersized storm sewers and storm outfall systems.	Flooding, Hurricane/Tropical Storm	High	$13,500,000.00 - Office of Rural Community Affairs, Local Funds, US Army Corps of Engineers-Small Flood Control Projects, USDA Natural Resources Conservation Service-Emergency Watershed Protection Agency, Texas Water Development Board-Clean Water State Revolving Fund, Texas Water Development	Public Works, Emergency Management	Structural	Reduces structural and street flooding risks to new and existing buildings by improving the undersized storm sewer and outfall systems, enhancing drainage capacity in flood-prone areas.	Still relevant - Leave in 2025 plan

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
			Board (Development Fund II)-Texas Eater Development Fund, USDA Natural Resources Conservation Service-Watershed Protection and Flood Prevention Program, EPA-Non-point Source Grant Program, 406 Public Assistance Program (following federal disaster declaration), HMGP, PDM Grant Program (FEMA)				
34th St. Ditch Conveyance and Erosion Protection Improvements – 21st St. Basin, 10th Ave to Loop 197 - Reduce structural flooding in the drainage basin by increasing	Flooding, Hurricane/Tropical Storm	High	$3,000,000.00 - Office of Rural Community Affairs, Local Funds, US Army	Public Works, Emergency Management	Structural	Reduces structural flooding risks to new and existing buildings by	In Progress

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
channel conveyance, and to stabilize the channel banks from further erosion.			Corps of Engineers-Small Flood Control Projects, USDA Natural Resources Conservation Service-Emergency Watershed Protection Agency, Texas Water Development Board-Clean Water State Revolving Fund, Texas Water Development Board (Development Fund II)-Texas Eater Development Fund, USDA Natural Resources Conservation Service-Watershed			improving channel conveyance and stabilizing the ditch banks, preventing erosion and enhancing flood control in the area.	

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)							
PROJECT TITLE AND DESCRIPTION	**HAZARD ADDRESSED**	**PRIORITY**	**POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW AND EXISTING BUILDINGS**	**TIMELINE**
			Protection and Flood Prevention Program, EPA-Non-point Source Grant Program, 406 Public Assistance Program (following federal disaster declaration), HMGP, PDM Grant Program (FEMA)				
Freeway Park and Delaney Lake No. 3 Drainage Improvements - Reduce structural flooding in the Freeway Park area of the City by increasing stormwater conveyance by means of storm sewers, channels, inlets, improving surface drainage flow patterns, and providing stormwater detention. During Hurricane Harvey, a large number of homes in this area experienced structural flooding.	Flooding, Hurricane/Tropical Storm	High	$2,500,000.00 - Office of Rural Community Affairs, Hazard Mitigation Grant Program, Pre-Disaster Mitigation Grant Program,406 Public Assistance Program(following federal disaster declaration), Us Army Corps of Engineers-Small Flood Control	Public Works, Emergency Management	Structural	Reduces flooding risks to new and existing buildings in the Freeway Park area by improving stormwater conveyance, surface drainage, and detention, preventing structural flooding during future storms.	Completed

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
			Projects, USDA Natural Resources Conservation Service- Emergency Watershed Protection Agency, Texas Water Development Board(Development Fund II)- Texas Water Development Fund, USDA Natural Resources Conservation Service- Watershed Protection and Flood Prevention Program, EPA- Nonpoint Source Grant Program				

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
Texas City Hurricane Flood Protection Project - Improve the current levee system to provide protection from a Category 5 storm-Inner Rainwater Levee Restoration-West of 29th Street - The Inner Rainwater Levee separates the developed area of the City of Texas City from Moses Lake. During Hurricane Harvey, an 1,800 foot long segment of the levee was severely eroded by wave action and rising waters. The purpose of this project is to harden the Lake-facing side of the levee to protect against erosion that could threaten the stability of the levee.	Hurricane / Tropical Storm, Flooding, Dam/Levee Failure	Medium	$2,000,000.00 - Funding source dependent on project scope	Engineering, Emergency Management	Structural	Protects new and existing buildings by restoring and hardening the Inner Rainwater Levee, ensuring its stability against erosion from storm surge and protecting the City from catastrophic flooding during a Category 5 storm.	Still relevant - Keep in 2025 plan
Storm Sewer Trunk Main Improvements - Westbury and 21st Ave. from 29th St. to 23rd St. - Reduce structural flooding and street flooding in the areas of 21st Ave, Westbury and 23rd Street, The area floods frequently due to undersized storm sewers and storm outfall systems.	Flooding, Hurricane/Tropical Storm	High	$10,000,000.00 - Office of Rural Community Affairs, Local Funds, US Army Corps of Engineers-Small Flood Control	Emergency Management	Structural	Reduces structural and street flooding risks to new and existing buildings by upgrading undersized	Complete

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
			Projects, USDA Natural Resources Conservation Service-Emergency Watershed Protection Agency, Texas Water Development Board-Clean Water State Revolving Fund, Texas Water Development Board (Development Fund II)-Texas Eater Development Fund, USDA Natural Resources Conservation Service-Watershed Protection and Flood Prevention Program, EPA-			storm sewer and outfall systems, improving drainage capacity in flood-prone areas.	

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)							
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
			Non-point Source Grant Program, 406 Public Assistance Program (following federal disaster declaration), HMGP, PDM Grant Program (FEMA)				
Develop and provide public information and awareness for hazards - The planning area has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response, and recovery to the public fosters their ability to become self-sufficient. Information provided includes the following mitigation techniques (elevation, floodproofing, stabilization of soils in construction, electrical grounding devices, generators, insulating water pipes, xeriscaping, open foundations to minimize scour, include potential subsidence in freeboard calculations in flood-prone areas, roof and foundation supports, shutters,	Hurricane/Tropical Storm, Flooding, Extreme Heat, Tornado, Windstorm, Hailstorm, Lightning, Severe Winter Storm, Drought, Wildland Fire, Expansive Soils, Dam/Levee Failure	High	$10,000 annually - Grants/General Fund	Emergency Management	Structural	Enhances resilience of new and existing buildings by educating the public on hazard preparedness and mitigation techniques, helping reduce structural damage during disasters and improving the public's ability to respond effectively to	Keep in 2025 plan

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
shatter-proof and high wind doors and windows, create defensible space around power lines, oil/gas lines, etc.); evacuation routes/procedures; workshop/training programs; alert systems, and the like.						emergency situations.	
Install hazard warning systems - Citywide - Hazard warning systems complement the methods of warning already used by the County Emergency Operation Center and the National Weather Service.	Hurricane/Tropical Storm, Flooding, Extreme Heat, Tornado, Windstorm, Hailstorm, Lightning, Severe Winter Storm, Drought, Wildland Fire, Dam/Levee Failure	High	$35,000 each - HMGP. General Fund	Emergency Management	Emergency Services	Improves the community's ability to prepare for and respond to emergency situations by providing enhanced hazard warning capabilities, ensuring timely alerts to both new and existing developments.	Keep in 2025 plan
Stormproof/retrofit critical facilities and infrastructure - City-owned properties - New construction and existing critical facilities and infrastructure should include advanced mitigation techniques. Measures include roof and foundation supports, shutters, shatter-proof and high wind doors and windows, electrical surge protection,	Hurricane/Tropical Storm, Flooding, Extreme Heat, Tornado, Windstorm, Hailstorm, Lightning, Severe Winter Storm, Drought,	High	Unknown, dependent upon facility type - HMGP, CDBG, General Funds	Emergency Management	Property Protection	Improves resilience of critical facilities by incorporating storm proofing measures, reducing damage during extreme weather and ensuring	Keep in 2025 plan

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)							
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
stabilization of soils, addition of thermal insulation, etc.	Wildland Fire, Expansive Soils, Dam/Levee Failure					operational continuity.	
Implement stormwater management plan to improve drainage during flood and other weather events - Citywide - Routinely cleaning and repairing stormwater drains can help avoid unnoticed clogs that may hamper the efficiency of the stormwater system. Insuring that flow paths will have the capacity to convey storm- event flood water volumes will reduce damages.	Flooding, Hurricane/Tropical Storm	High	Office of Rural Community Affairs, HMGP, PDM Grant Program,406 Public Assistance Program (following federal disaster declaration), USACE-Small Flood Control Projects, USDA Natural Resources Conservation Service-Emergency Watershed Protection Agency, Texas Water Development Board(Development Fund II)-Texas Water	Public Works	Property Protection	Reduces flood risk to new and existing buildings by maintaining efficient stormwater drainage and ensuring flow paths can handle stormwater volumes, minimizing potential damage.	Keep in 2025 plan

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
			Development Fund, USDA Natural Resources Conservation Service-Watershed Protection and Flood Prevention Program, EPA-Nonpoint Source Grant Program				
Purchase and install generators for existing and new critical facilities and infrastructure - Critical Facilities throughout Texas City - Generators are essential for providing continual operations in the event of a disaster. As funding becomes available, the city will apply for grants to install/upgrade generators to support existing or new facilities/infrastructure.	Hurricane/Tropical Storm, Flooding, Extreme Heat, Tornado, Windstorm, Hailstorm, Lightning, Severe Winter Storm, Drought, Wildland Fire, Dam/Levee Failure	High	$400,000 - HMGP, General Funds	City Administration	Emergency Services	Ensures continuous operations of critical facilities during disasters by installing or upgrading generators, improving resilience for both new and existing infrastructure.	Keep in 2025 plan

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)							
PROJECT TITLE AND DESCRIPTION	**HAZARD ADDRESSED**	**PRIORITY**	**POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW AND EXISTING BUILDINGS**	**TIMELINE**
Mitigate (elevate, reconstruct, acquisition, demolition) Repetitive Flood Claim / Severe Repetitive Loss (RFC/SRL) properties - Citywide — see Section 22 and Appendix E for listing of non- mitigated properties	Flooding	High	TBD - HMGP/FMA	City Administration & applicable state and county agencies	Property Protection	Reduces flood risk to existing buildings by mitigating properties with repetitive flood claims through elevation, reconstruction, acquisition, or demolition, preventing future damage.	Keep in 2025 plan
Update regulations and permit requirements to address enhanced hazard mitigation strategies - Update and/or develop regulations and permits to address hazards prone to the area and include any changes in future development areas. Develop regulation restricting development in areas with soil considered poor or unsuitable for development.	Hurricane/Tropical Storm, Flooding, Extreme Heat, Tornado, Windstorm, Hailstorm, Lightning, Severe Winter Storm, Drought, Wildland Fire, Expansive Soils, Dam/Levee Failure	High	No cost / NA	City administration and applicable departments	Prevention	Ensures new and existing buildings are protected by updated regulations that address hazard-prone areas, restricting development in unsuitable soil areas to reduce long-term risk.	Keep in 2025 plan

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
Purchase a portable reader board - Purchase and maintain a portable reader board mounted on a trailer that could be deployed during emergencies and other events within the Citv. The reader board would be accessible to all emergency services as well as Public Works and Parks and Recreation within the City. This project would convey Public information to the public during evacuations and other emergencies.	Hurricane/Tropical Storm, Flooding, Tornado, Windstorm, Extreme Heat, Severe Winter Storm	High	$40,000 (reader board and trailer) - Grants and/or city operating funds	Police Department, Fire Department	Public Education and Awareness	Enhances communication during emergencies, ensuring public safety by providing timely information to residents, which indirectly supports the protection of buildings and infrastructure by guiding evacuations and informing the public.	Keep in 2025 plan
Public information and warning mobile application for Android and Apple applications - Research and develop a mobile application to be available for citizens to download for IOS and Android operating systems If cost is too prohibitive, research and promote applications already developed to encourage emergency preparedness Promote the use of emergency	Hurricane/Tropical Storm, Flooding, Extreme Heat, Tornado, Windstorm, Hailstorm, Lightning, Severe Winter Storm, Drought, Wildland Fire,	Medium	Research has shown that costs associated with the development of an emergency management application — simple, table based app — for IOS systems range $500 to $4,000. All	Emergency Management, IT Department	Public Education and Awareness	Improves public awareness and preparedness, which indirectly helps reduce risk to buildings and infrastructure by promoting proactive disaster management and encouraging	Keep in 2025 plan

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)							
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
preparedness apps currently available at the Apple Store	Dam/Levee Failure		content & clear direction is provided by the organization. If GPS locators, social media integration, and additional add-ins are included, costs will rise accordingly. If costs are maintained in the range of $5,000 to $10,000, proposals could be made during the budget development process to include this project in the annual operating budget. - If this project is rejected by the governing body, research and application for			timely evacuations and actions during emergencies.	

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
			grants could provide an alternative funding source				
Improve Texas City's CRS (Community Rating System) rating - To attain a lower CRS rating and improve the city's approach for addressing RL/SRL (Repetitive Loss/Severe Repetitive Loss) properties, the city will implement the following: Meet criteria necessary to achieve a lower CRS rating through this initiative. Initiate and implement additional floodplain requirements that are above the minimum floodplain compliance. Update the city's current floodplain map to coordinate with the currently Proposed FEMA Flood Insurance Rate Map relative to all floodplains as proposed.	Flooding	High	$100,000 - General fund through annual budget process/app v for planning grant funding	Community Development, Floodplain Manager, Emergency Management	Prevention	Enhances flood risk mitigation for new and existing buildings by improving floodplain management and insurance options, reducing flood damage risk and aiding faster recovery.	Keep in 2025 plan
Conduct National Weather Service tornado drills along with elementary school in jurisdiction - City Wide - Texas City will work with area schools to develop and execute tornado drills.	Flooding, Tornado, Windstorm, Hailstorm, Lightning	High	No cost	Emergency Management	Public Education and Awareness	Enhances tornado preparedness, reducing risk to property and ensuring safe evacuation in schools and nearby buildings.	Completed

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)							
PROJECT TITLE AND DESCRIPTION	**HAZARD ADDRESSED**	**PRIORITY**	**POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW AND EXISTING BUILDINGS**	**TIMELINE**
Construct a storm water detention area - The location of this detention area is located near FM 1765 and SH 146 - Lat. 29.378173732237762 Long. -94.9524736404419 Dow Chemical purchased several acres of land east of town for use as a greenbelt. Texas City would like to build a detention pond in this area that will help alleviate flooding on the east side. Phase I will include a feasibility study and a drainage analysis of the new pond row acquisition and associated conveyance improvements on a part of 10 acres of land. The engineering of the pond will be based on results of the study and analysis. Construction of the pond will be the second phase.	Flooding, Hurricane/Tropical Storm, Dam/Levee Failure	Medium	$4,000,000 - Grant / Bond / Corporate Sponsor	Public Works	Property Protection	Reduces flooding risk in the east side of Texas City by increasing stormwater detention capacity, helping prevent damage to buildings and infrastructure.	Still relevant - Keep in 2025 plan
Analyze the efficacy of and acquire a 100' Aluminum Aerial platform fire apparatus for residential and commercial structure fire rescues. - Citywide - An aerial ladder can be used in many rescue situations, helping the City assist in responding to refinery fires/ explosions, major pipeline breaches, flood water rescues, and residential fires. An aerial apparatus would also aid in swift water and coastal flooding emergencies, as well as assist in plant explosion rescues.	Hurricane/Tropical Storm, Flooding, Tornado, Windstorm, Lightning, Wildfire (Urban and Rural)	High	$1,500,000 - Grant / General Budget	Fire Department	Emergency Services	Enhances rescue capabilities for high-rise, commercial, and residential buildings, improving safety and reducing risk during fires, pipeline breaches, and flooding.	Completed

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
Become a Certified NWS StormReady Community - StormReady helps arm America's communities with the communication and safety skills needed to save lives and property-before and during an event. StormReady helps leaders and emergency managers strengthen local safety programs. StormReady communities are better prepared to save lives from the onslaught of severe weather through advanced planning, education, and awareness. Contact NWS before applying, complete application, schedule verification meeting and receive approval.	Hurricane/Tropical Storm, Flooding, Tornado, Windstorm, Hailstorm, Lightning, Drought, Extreme Heat, Severe Winter Storm	High	Undetermined - General Funds	Emergency Management	Public Education and Awareness	Enhances severe weather preparedness, reducing risks and damage to buildings through better planning, education, and timely alerts.	Completed
Safe Rooms/Community Shelters - Citywide - The area is prone to tornado and high wind events. Encourage construction and use of safe rooms in existing and new structures. Allow citizens to install safe rooms at a significant discount in preexisting homes. Provide homeowners and developers with funds to assist in installing a safe room in new homes.	Hurricane/Tropical Storm, Flooding, Tornado, Windstorm	High	Unknown	Emergency Management, Planning and Zoning and Building	Structural	Enhances safety of existing and new buildings by encouraging safe room installations, improving protection during tornadoes and high winds.	Keep in the 2025 plan
Study Dam/Levee Failure Inundation - This action will determine expected inundation	Dam/Levee Failure	Medium	Unknown	Public Works	Prevention	Identifies potential flood risks from dam or levee failure,	Keep in the 2025 plan

City of Texas City Mitigation Actions (Previous Plan Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	TIMELINE
locations and peak discharge rates in the event of a dam/levee failure in Texas City.						enabling targeted mitigation strategies to protect existing and future buildings from inundation.	

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPORATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
Hardening of rainwater pump stations A and B. Design and install new or rebuilt motors to run the pumps, hardened structure to protect the critical infrastructure, technology to make the structure more resilient.	Floods, Hurricanes/Tropical Storms	High	FEMA HMA Grants, City funds	City of Texas City	Structure and infrastructure projects	Enhances protection of critical flood control infrastructure, ensuring continued operation during extreme weather events.	Capital Improvement Plan	5 years
Rainwater Pump Station A Capacity Improvements- Improve flood control by increasing the maximum pumping rate of Rainwater Pump Station A. Presently, all rainwater in the levee-protected areas of the City must pass through either Pump Station A or Pump Station B. Pump Station A has a capacity of 375,000 gallons per minute, while Pump Station B has a capacity of 625,000 gallons per	Flooding, Hurricane/Tropical Storm	High	$9,000,000 - City Funds, FEMA Mitigation Grant Funds	Public Works, Engineering, Emergency Management	Structure and infrastructure projects	The project will reduce the risk of structural flooding for both new and existing buildings within the levee-protected areas. Lower flood water elevations will enhance long-term resilience and property protection.	Capital Improvement Plan	5 years

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
minute. By increasing the capacity of Pump Station A, the City will be able to maintain lower flood water elevations in the City, thereby reducing structural flooding.								
Southpointe Subdivision Drainage Improvements - Implement adequate provisions to reduce or eliminate standing water in existing buildings. Improvements may include wider drainage systems and increased size in culverts, etc. Identify drainage areas in need of increased culverts or widening and set priorities for developing funding requests and implementation of construction.	Flooding, Hurricane/Tropical Storm	High	$3,000,000 Office of Rural Community Affairs, Hazard Mitigation Grant Program, Pre-Disaster Mitigation Grant Program,406 Public Assistance Program(following federal disaster declaration), Us Army Corps of Engineers-Small Flood Control Projects, USDA	Public Works, Emergency Management	Structure and infrastructure projects	Reduces the risk of water accumulation and potential damage in existing buildings, improving overall drainage performance in the subdivision. Enhances site conditions for future development.	Capital Improvement Plan, Stormwater Management Plan	2 years

City of Texas City Mitigation Actions (New Mitigation Actions)								
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
			Natural Resources Conservation Service-Emergency Watershed Protection Agency, Texas Water Development Board(Development Fund II)-Texas Water Development Fund, USDA Natural Resources Conservation Service-Watershed Protection and Flood Prevention Program, EPA-Non point Source Grant Program					

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
Delany Lake #2 Stormwater Pump Station - Improve flood control by reducing flood water surface in Delaney Lake. Delany Lake is utilized as a stormwater detention basin, but due to the nearly flat terrain of the area has a very limited outfall capacity. Adding a pump station would allow the City to maintain a lower normal water level in the lake, thereby providing additional detention volume, and would allow an increase in outfall rate out of the pond for the purpose of reducing structural flooding in the area.	Flooding, Hurricane/Tropical Storm	High	$2,000,000 - City Funds, FEMA Mitigation Grant Funds	Public Works, Engineering, Emergency Management	Structure and infrastructure projects	Enhances stormwater management capacity for existing and future development.	Capital Improvement Plan	3 years
Storm Sewer Improvements - 21st St. Basin, 10th Ave. to Loop 197 - Reduce structural	Flooding, Hurricane/Tropical Storm	High	$13,500,000.00 - Office of Rural Community Affairs, Local	Public Works, Emergency Management	Structure and infrastructure projects	Decreases the frequency and severity of structural and	Capital Improvement Plan, Stormwater Management Plan	3 years

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
flooding and street flooding in the areas of 21st Street and 23rd Street, between 10th Avenue and Loop 197 North. The area floods frequently due to undersized storm sewers and storm outfall systems.			Funds, US Army Corps of Engineers-Small Flood Control Projects, USDA Natural Resources Conservation Service-Emergency Watershed Protection Agency, Texas Water Development Board-Clean Water State Revolving Fund, Texas Water Development Board (Development Fund II)-Texas Eater Development Fund, USDA Natural Resources Conservation			street flooding in the affected area.		

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
			Service-Watershed Protection and Flood Prevention Program, EPA-Non-point Source Grant Program, 406 Public Assistance Program (following federal disaster declaration), HMGP, PDM Grant Program (FEMA)					
34th St. Ditch Conveyance and Erosion Protection Improvements – 21st St. Basin, 10th Ave. to Loop 197 - Reduce structural flooding in the drainage basin by increasing channel conveyance, and to stabilize the	Flooding, Hurricane/Tropical Storm	High	$3,000,000.00 - Office of Rural Community Affairs, Local Funds, US Army Corps of Engineers-Small Flood Control Projects, USDA Natural	Public Works, Emergency Management	Natural systems protection	Improves flood protection by enhancing drainage capacity and reducing erosion risks, helping to safeguard nearby	Capital Improvement Plan, Stormwater Management Plan	In progress

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
channel banks from further erosion.			Resources Conservation Service-Emergency Watershed Protection Agency, Texas Water Development Board-Clean Water State Revolving Fund, Texas Water Development Board (Development Fund II)-Texas Eater Development Fund, USDA Natural Resources Conservation Service-Watershed Protection and Flood Prevention Program, EPA-			structures and infrastructure.		

City of Texas City Mitigation Actions (New Mitigation Actions)								
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
			Non-point Source Grant Program, 406 Public Assistance Program (following federal disaster declaration), HMGP, PDM Grant Program (FEMA)					
Texas City Hurricane Flood Protection Project - Improve the current levee system to provide protection from a Category 5 storm-Inner Rainwater Levee Restoration-West of 29th Street - The Inner Rainwater Levee separates the developed area of the City of Texas City from Moses Lake. During Hurricane Harvey, an 1,800 foot long segment of the	Hurricane / Tropical Storm, Flooding, Dam/Levee Failure	Medium	$2,000,000.00 - Funding source dependent on project scope	Engineering, Emergency Management	Structure and infrastructure projects	Strengthens storm surge protection for existing developments by reinforcing a critical levee segment, reducing the risk of catastrophic flooding during extreme weather events.	Capital Improvement Plan	5 years

City of Texas City Mitigation Actions (New Mitigation Actions)								
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
levee was severely eroded by wave action and rising waters. The purpose of this project is to harden the Lake-facing side of the levee to protect against erosion that could threaten the stability of the levee.								
Develop and provide public information and awareness for hazards - The planning area has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response, and recovery to the public fosters their	Hurricane/Tropical Storm, Flooding, Extreme Heat, Tornado, Windstorm, Hailstorm, Lightning, Severe Winter Storm, Drought, Wildland Fire, Expansive Soils, Dam/Levee Failure	High	$10,000 annually - Grants/General Fund	Emergency Management	Education and awareness programs	Empowers property owners and residents to implement hazard mitigation techniques, enhancing the resilience and safety of both new and existing structures.	Emergency Operations Plan	6 months

City of Texas City Mitigation Actions (New Mitigation Actions)								
PROJECT TITLE AND DESCRIPTION	**HAZARD ADDRESSED**	**PRIORITY**	**POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW AND EXISTING BUILDINGS**	**INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
ability to become self-sufficient. Information provided includes the following mitigation techniques (elevation, floodproofing, stabilization of soils in construction, electrical grounding devices, generators, insulating water pipes, xeriscaping, open foundations to minimize scour, include potential subsidence in freeboard calculations in flood-prone areas, roof and foundation supports, shutters, shatter-proof and high wind doors and windows, create defensible space around power lines, oil/gas lines, etc.); evacuation routes/procedures; workshop/training programs; alert systems, and the like.								

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPORATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
Install hazard warning systems - Citywide - Hazard warning systems to complement the methods of warning already used by the National Weather Service.	Hurricane/Tropical Storm, Flooding, Extreme Heat, Tornado, Windstorm, Hailstorm, Lightning, Severe Winter Storm, Drought, Wildland Fire, Dam/Levee Failure	High	$35,000 each - HMGP. General Fund	Emergency Management	Education and awareness programs	Enhances early warning capabilities for residents and property owners, allowing for timely protective actions that reduce risk to structures and occupants.	Emergency Operations Plan	12 months
Stormproof/retrofit critical facilities and infrastructure - City-owned properties - New construction and existing critical facilities and infrastructure should include advanced mitigation techniques. Measures include roof and foundation supports, shutters, shatter-proof and high wind doors and windows, electrical surge	Hurricane/Tropical Storm, Flooding, Extreme Heat, Tornado, Windstorm, Hailstorm, Lightning, Severe Winter Storm, Drought, Wildland Fire, Expansive Soils, Dam/Levee Failure	High	Unknown, dependent upon facility type - HMGP, CDBG, General Funds	Emergency Management	Structure and infrastructure projects	Improves the durability and operational continuity of critical city-owned facilities, reducing the risk of damage during severe weather events and enhancing public safety.	Capital Improvements Plan	18 months

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
protection, stabilization of soils, addition of thermal insulation, etc.								
Implement stormwater management plan to improve drainage during flood and other weather events - Citywide - Routinely cleaning and repairing stormwater drains can help avoid unnoticed clogs that may hamper the efficiency of the stormwater system. Insuring that flow paths will have the capacity to convey storm- event flood water volumes will reduce damages.	Flooding, Hurricane/Tropical Storm	High	Office of Rural Community Affairs, HMGP, PDM Grant Program,406 Public Assistance Program (following federal disaster declaration), USACE-Small Flood Control Projects, USDA Natural Resources Conservation Service-Emergency Watershed Protection Agency, Texas Water Development Board(Develop	Public Works	Local plans and regulations	Improves stormwater drainage efficiency, reducing the likelihood of flooding and water damage to both new and existing properties across the city.	Stormwater Management Plan	12 months

City of Texas City Mitigation Actions (New Mitigation Actions)								
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
			ment Fund II)- Texas Water Development Fund, USDA Natural Resources Conservation Service- Watershed Protection and Flood Prevention Program, EPA- Nonpoint Source Grant Program					
Install generators for existing and new critical facilities and infrastructure - Critical Facilities throughout Texas City - Generators are essential for providing continual operations in the event of a disaster. As funding becomes available, the city will apply for grants	Hurricane/Tropical Storm, Flooding, Extreme Heat, Tornado, Windstorm, Hailstorm, Lightning, Severe Winter Storm, Drought, Wildland Fire,	High	$400,000 - HMGP, General Funds	City Administration	Structure and infrastructure projects	Ensures continuous operation of critical facilities during power outages, enhancing safety and functionality for both existing and future infrastructure.	Capital Improvements Plan	24 months

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
to install/upgrade generators to support existing or new facilities/infrastructure.	Dam/Levee Failure							
Mitigate (elevate, reconstruct, acquisition, demolition) Repetitive Flood Claim / Severe Repetitive Loss (RFC/SRL) properties - Citywide — see Section 22 and Appendix E for listing of non- mitigated properties	Flooding	High	TBD - HMGP/FMA	City Administration & applicable state and county agencies	Structure and infrastructure projects	Reduces flood risk for properties with a history of repetitive flood claims by elevating, reconstructing, or acquiring affected buildings, improving overall flood resilience in the city.	Stormwater Management Plan	24 months
Update regulations and permit requirements to address enhanced hazard mitigation strategies - Update and/or develop regulations and permits to address hazards prone to the area and	Hurricane/Tropical Storm, Flooding, Extreme Heat, Tornado, Windstorm, Hailstorm, Lightning, Severe Winter Storm,	High	No cost / NA	City administration and applicable departments	Local plans and regulations	Improves long-term safety by enforcing stricter building regulations, reducing the risk of structural damage in	Building Code, Stormwater Ordinance, Floodplain Ordinance	12 months

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
include any changes in future development areas. Develop regulation restricting development in areas with soil considered poor or unsuitable for development.	Drought, Wildland Fire, Expansive Soils, Dam/Levee Failure					hazard-prone areas, and promoting sustainable development practices.		
Plan, implement, and maintain the use of a portable reader board - Plan, implement, and maintain the use of a portable reader board mounted on a trailer that could be deployed during emergencies and other events within the Citv. The reader board would be accessible to all emergency services as well as Public Works and Parks and Recreation within the City. This project would convey Public information to the public during	Hurricane/Tropical Storm, Flooding, Tornado, Windstorm, Extreme Heat, Severe Winter Storm	High	$40,000 (reader board and trailer) - Grants and/or city operating funds	Police Department, Fire Department	Education and awareness programs	Enhances communication during emergencies by implementing and maintaining a portable reader board for public information, improving safety and response coordination.	Emergency Operations Plan	6 months

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
evacuations and other emergencies.								
Public information and warning mobile application for Android and Apple applications - Research and develop a mobile application to be available for citizens to download for IOS and Android operating systems If cost is too prohibitive, research and promote applications already developed to encourage emergency preparedness Promote the use of emergency preparedness apps currently available at the Apple Store	Hurricane/Tropical Storm, Flooding, Extreme Heat, Tornado, Windstorm, Hailstorm, Lightning, Severe Winter Storm, Drought, Wildland Fire, Dam/Levee Failure	Medium	Research has shown that costs associated with the development of an emergency management application — simple, table based app — for IOS systems range $500 to $4,000. All content & clear direction is provided by the organization. If GPS locators, social media integration, and additional add-ins are included, costs will rise	Emergency Management, IT Department	Education and awareness programs	Improves public preparedness and response capabilities, reducing risks to properties by providing timely emergency information via a mobile app.	Emergency Operations Plan	12 months

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
			accordingly. If costs are maintained in the range of $5,000 to $10,000, proposals could be made during the budget development process to include this project in the annual operating budget. - If this project is rejected by the governing body, research and application for grants could provide an alternative funding source					

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
Improve Texas City's CRS (Community Rating System) rating - To attain a lower CRS rating and improve the city's approach for addressing RL/SRL (Repetitive Loss/Severe Repetitive Loss) properties, the city will implement the following: Meet criteria necessary to achieve a lower CRS rating through this initiative. Initiate and implement additional floodplain requirements that are above the minimum floodplain compliance. Update the city's current floodplain map to coordinate with the currently Proposed FEMA Flood Insurance Rate Map relative to all floodplains as proposed.	Flooding	High	$100,000 - General fund through annual budget process/apply for planning grant funding	Community Development, Floodplain Manager, Emergency Management	Local plans and regulations	Improves flood risk management and reduces insurance premiums for both existing and future buildings by achieving a lower CRS rating and enhancing floodplain regulations.	Stormwater Ordinance, Floodplain Ordinance, Stormwater Management Plan	18 months

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPORATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
Construct a storm water detention area - The location of this detention area is located near FM 1765 and SH 146 - Lat. 29.378173732237762 Long. -94.9524736404419 Dow Chemical purchased several acres of land east of town for use as a greenbelt. Texas City would like to build a detention pond in this area that will help alleviate flooding on the east side. Phase I will include a feasibility study and a drainage analysis of the new pond row acquisition and associated conveyance improvements on a part of 10 acres of land. The engineering of the pond will be based on results of the study and analysis. Construction of	Flooding, Hurricane/Tropical Storm, Dam/Levee Failure	Medium	$4,000,000 - Grant / Bond / Corporate Sponsor	Public Works	Structure and infrastructure projects	Reduces flooding risks on the east side of Texas City by providing additional stormwater detention, improving flood control for both existing properties and future developments.	Capital Improvements Plan, Emergency Operations Plan	36 months

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
the pond will be the second phase.								
Safe Rooms/Community Shelters - Citywide - The area is prone to tornado and high wind events. Encourage construction and use of safe rooms in existing and new structures. Allow citizens to install safe rooms at a significant discount in preexisting homes. Provide homeowners and developers with funds to assist in installing a safe room in new homes.	Hurricane/Tropical Storm, Flooding, Tornado, Windstorm	High	TBD	Emergency Management, Planning and Zoning and Building	Structure and infrastructure projects	Enhances protection against tornadoes and high wind events by encouraging the installation of safe rooms in both new and existing structures, improving community resilience.	Emergency Operations Plan	24 months
Study Dam/Levee Failure Inundation - This action will determine expected inundation locations and peak discharge rates in the event of a	Dam/Levee Failure	Medium	TBD	Public Works	Local plans and regulations	Identifies flood risks from potential dam/levee failures, providing critical	Emergency Operations Plan	12 months

City of Texas City Mitigation Actions (New Mitigation Actions)								
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
dam/levee failure in Texas City.						information to mitigate damage to properties and infrastructure in vulnerable areas.		
Hardening of rainwater pump stations A and B. Implement purchase of new or rebuilt motors to run the pumps, hardened structure to protect the critical infrastructure, technology to make the structure more resilient.	Floods, Hurricanes/Tropical Storms	High	FEMA HMA Grants, City funds	City of Texas City	Structure and infrastructure projects	Strengthens flood control infrastructure by improving the resilience of rainwater pump stations, reducing the risk of flooding to surrounding properties.	Capital Improvement Plan	5 years
Design and implement a new pump station that will relieve pressure on the Moses Lake reservoir when the flood gate is closed. This new pump station will be able to pump water from the	Floods, Hurricanes/Tropical Storms	High	FEMA HMA Grants, City funds	City of Texas City	Structure and infrastructure projects	Improves flood management, lowering the risk of flooding to nearby properties and infrastructure during storm events.	Capital Improvement Plan	5 years

City of Texas City Mitigation Actions (New Mitigation Actions)								
PROJECT TITLE AND DESCRIPTION	**HAZARD ADDRESSED**	**PRIORITY**	**POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW AND EXISTING BUILDINGS**	**INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
reservoir, over the levee system, and into the bay.								
Host/Hold a Town Hall to educate the community on how to deal with severe weather	Windstorms, Extreme Winter Storms, Drought, Tornado, Hurricanes/Tropical Storms, Lightning, Extreme Heat, Floods, Hailstorms	Medium	City funds	Texas City Emergency Management	Education and awareness programs	Increases community preparedness for severe weather, empowering residents to take protective measures that reduce the risk of damage to their properties.	Emergency Operations Plan	1 year
Design and implement improving the Industrial Pumping Plant that supplies water to our industrial complex. This could include but not limited to hardening of the building, power supply, upgrade the pumps, Better technology to ensure efficient and effective	Windstorms, Extreme Winter Storms, Drought, Tornado, Hurricanes/Tropical Storms, Lightning, Floods, Hailstorms	Low	FEMA HMA Grants, City funds, TWDB grant/loans	Gulf Coast Water Authority	Structure and infrastructure projects	Enhances the resilience of the industrial water supply, ensuring continuous service and reducing operational disruptions to industrial buildings during	Capital Improvement Plan	5 years

City of Texas City Mitigation Actions (New Mitigation Actions)								
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
operations during hazards.						hazardous events.		
Texas City Reservoir, design and implement improvements to the levee system to ensure the reservoir contains its water during extreme weather events	Floods, Hurricanes/Tropical Storms, Dam/Levee Failure	High	FEMA HMA Grants, City funds, USACE Partnership funding	Gulf Coast Water Authority	Structure and infrastructure projects	Improves flood protection by reinforcing the levee system, reducing the risk to properties near the Reservoir during extreme weather.	Capital Improvement Plan	5 years
Thomas Mackey Wastewater Treatment Plant. Design and implement building of a new facility or upgrade current facility. Harden the facility to ensure continued operations during extreme weather events. Expand the facility to ensure it can keep up with expanding demand and capacity. Improve technology to ensure effective and	Wildfire, Windstorms, Extreme Winter Storms, Drought, Tornado, Hurricanes/Tropical Storms, Lightning, Extreme Heat, Floods, Dam Levee Failure Hailstorms	High	FEMA HMA Grants, City funds, TWDB grant/loan funds	City of Texas City Public Works	Structure and infrastructure projects	Enhances wastewater treatment capacity and resilience, ensuring uninterrupted service and reducing the risk of environmental damage to properties during extreme weather events.	Capital Improvement Plan	5 years

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
efficent operations during natural disasters.								
Emergency Operations Center. Design and implement building a new facility that is capable of withstanding a category 5 hurricane. Raise the facility to ensure it can continue operations during a historic flood event, and equip it with the latest technology to ensure continuity of operations during all natural and manmade disasters.	Wildfire, Windstorms, Extreme Winter Storms, Drought, Tornado, Hurricanes/Tropical Storms, Lightning, Extreme Heat, Floods, Dam Levee Failure Hailstorms	High	FEMA HMA Grants, City funds	City of Texas City Emergency Management, Planning Engineering,	Structure and infrastructure projects	Strengthens emergency management capabilities, ensuring continuity of operations and minimizing risks to critical infrastructure.	Capital Improvement Plan, Emergency Operations Plan	5 years
Texas City Fire Department Administration Building, Hardening. Design and implement improving generator. Ensure the expansion of the admin building is rated for higher winds	Windstorms, Extreme Winter Storms, Tornado, Hurricanes/Tropical Storms	Medium	FEMA HMA Grants, FEMA EOC grant program, City funds	Texas City Fire Department	Structure and infrastructure projects	Enhances the reliability and resilience of emergency response services and critical infrastructure, ensuring	Capital Improvement Plan, Emergency Operations Plan	5 years

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPORATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
						operational continuity.		
Texas City Fire Stations, design and implement improvement of generators.	Windstorms, Extreme Winter Storms, Tornado, Hurricanes/Tropical Storms	Medium	FEMA HMA Grants, FEMA EOC grant program, City funds	Texas City Fire Department	Structure and infrastructure projects	Enhances the reliability and resilience of emergency response services and critical infrastructure, ensuring operational continuity.	Capital Improvement Plan, Emergency Operations Plan	2 years
Police Department design and implement improving and upgrading of generator.	Windstorms, Extreme Winter Storms, Tornado, Hurricanes/Tropical Storms	Medium	FEMA HMA Grants, FEMA EOC grant program, City funds	Texas City Police Department	Structure and infrastructure projects	Enhances the reliability and resilience of emergency response services and critical infrastructure, ensuring operational continuity.	Capital Improvement Plan, Emergency Operations Plan	2 years

City of Texas City Mitigation Actions (New Mitigation Actions)

PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPORATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
Levee System, Hurricane storm surge levee – Design and implement improvement of the levee by upgrading gate and valve systems including the flood gate at Moses Lake, repair and harden the I-wall that is currently damaged, raise the overall height of the levee	Hurricanes/Tropical Storms	High	FEMA HMA Grants, TWDB FIF program, City funds, USACE partnership funding	Texas City Emergency Management, engineering and planning, U.S. Army Corp of Engineers	Structure and infrastructure projects	Protects new and existing buildings by enhancing the hurricane storm surge levee system, reducing flood risk during extreme weather events.	Capital Improvement Plan, Emergency Operations Plan, Economic Development Plan, Comprehensive Plan	5 years
Inter levee system between Moses Lake and the City. Design and implement raising the levee to ensure levee does not breach during storms	Floods, Hurricanes/Tropical Storms	High	FEMA HMA Grants, TWDB FIF program, City funds, USACE partnership funding	Texas City Engineering and Planning, Public Works	Structure and infrastructure projects	Protects new and existing buildings by reducing the risk of levee breaches and associated flooding.	Capital Improvement Plan, Emergency Operations Plan	5 years
Design and install 3rd pump station to maintain moses lake reservoir system during storms. Design and install another pump station which will pump	Floods, Hurricanes/Tropical Storms	High	FEMA HMA Grants, TWDB FIF program, City funds, USACE	Texas City Engineering and Planning, Public Works	Structure and infrastructure projects	Protects new and existing buildings by improving flood control and reducing the risk of	Capital Improvement Plan	5 years

City of Texas City Mitigation Actions (New Mitigation Actions)								
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
water out of Moses Lake reservoir into Galveston Bay			partnership funding			overflow during storm events.		
City Hall - current building built in the 1950's. Design and build new facility which is hardened and raised to prevent flooding. Incorporate all departments which are spread out throughout the city to ensure continuity of operations during disasters.	Wildfire, Windstorms, Extreme Winter Storms, Drought, Tornado, Hurricanes/Tropical Storms, Lightning, Extreme Heat, Floods, Dam Levee Failure Hailstorms	High	FEMA HMA Grants, TWDB FIF program, City funds	Texas City Engineering and Planning, Public Works	Structure and infrastructure projects	Improves resilience by constructing a hardened, elevated City Hall to withstand flooding and extreme weather, ensuring continuous city operations.	Capital Improvement Plan, Emergency Operations Plan	5 years
Texas City Dike - The Dike is 5.3 miles long and protects the Port of Texas City shipping lanes as well as provides recreation and access to boat ramps. The Dike consistently endures damage during storms. The south side of the dike is well protected by large granite blocks, the	Windstorms, Tornado, Hurricanes/Tropical Storms, Coastal Erosion, Floods	High	FEMA HMA Grants, TWDB FIF program, City funds, USACE partnership funding	Texas City public works, U.S. Army Corp of Engineers	Natural systems protection, Structure and infrastructure projects	Improves storm resilience and emergency response by reinforcing the unprotected side of the Texas City Dike, enhancing infrastructure durability, and	Capital Improvement Plan, Emergency Operations Plan, Economic Development Plan, Comprehensive Plan	5 years

City of Texas City Mitigation Actions (New Mitigation Actions)								
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPORATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
north side of the dike needs the same type of protection. Engineering a way to get power and utilities to the Dike will help the resiliency of the road. Improve the shoulders of the road to help emergency vehicles respond.						enabling utility access.		
Local Industry - Harden the electrical service to industry, improve early warning system to the community in case of release from industry due to a disaster	Windstorms, Extreme Winter Storms, Drought, Tornado, Hurricanes/Tropical Storms, Lightning, Extreme Heat, Floods,	High	FEMA HMA Grants, City funds	Texas New-Mexico Power, Industry, Texas City Emergency Management	Structure and infrastructure projects	Improves the power capabilities and resiliency of local industry by hardening electrical services and enhancing early warning systems, reducing risks to nearby properties during disasters.	Emergency Operations Plan, Economic Development Plan	2 years

City of Texas City Mitigation Actions (New Mitigation Actions)								
PROJECT TITLE AND DESCRIPTION	**HAZARD ADDRESSED**	**PRIORITY**	**POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW AND EXISTING BUILDINGS**	**INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
Texas City Emergency Siren system upgrade. Design and implement new technology and upgrade our outdoor emergency alerting siren system. Add more sirens to the west side of the City where our greatest expansion is occurring	Wildfire, Windstorms, Extreme Winter Storms, , Tornado, Hurricanes/Tropical Storms, Lightning, , Floods, Dam Levee Failure, Hailstorms	High	FEMA HMA Grants, FEMA EOC grant program, City funds	Texas City Emergency Management, Information Technology	Structure and infrastructure projects	Upgrades the emergency siren system in existing areas and expands to growing areas, ensuring timely alerts and enhancing safety for both new and existing developments.	Emergency Operations Plan, Economic Development Plan	2 years
Design and Implement a Multi-Purpose Emergency Response Boat Program for the Port of Texas City	Windstorms, Extreme Winter Storms, Tornado, Hurricanes/Tropical Storms, Lightning, Floods	High	FEMA Port Security grant, USDOT PIDP, City funds	Texas City Emergency Management, Fire, and Police	Structure and infrastructure projects, Local plans and regulations	Improves emergency response and reduces risk to port facilities and surrounding infrastructure by constructing new boat facilities and implementing a multi-purpose response boat program.	Emergency Operations Plan	2 years

City of Texas City Mitigation Actions (New Mitigation Actions)								
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
Sanders Center – Design plans for and install a generator and build a new wing to house people in the event of a disaster.	Wildfire, Windstorms, Extreme Winter Storms, Tornado, Hurricanes/Tropical Storms, Extreme Heat, Floods, Dam Levee Failure	High	FEMA HMA Grants, City funds	Texas City Public Works and Planning and Engineering	Structure and infrastructure projects	Enhances disaster resilience by installing a generator and adding a new wing to the Sanders Center, providing shelter during emergencies.	Emergency Operations Plan	1 year
Carver Center - Design plans for and install a generator and build a new wing to house people in the event of a disaster.	Wildfire, Windstorms, Extreme Winter Storms, Tornado, Hurricanes/Tropical Storms, Extreme Heat, Floods, Dam Levee Failure	High	FEMA HMA Grants, City funds	Texas City Public Works and Planning and Engineering	Structure and infrastructure projects	Improves disaster preparedness by installing a generator and adding a new wing to the Carver Center, providing shelter during emergencies.	Emergency Operations Plan	1 year
Lift Stations - multiple - some of our lift stations have generators, other do not. Design and implement back up	Wildfire, Windstorms, Extreme Winter Storms, Drought, Tornado, Hurricanes/Tropi	High	FEMA HMA Grants, City funds	Texas City Public Works	Structure and infrastructure projects	Reduces the risk of service disruption and flood damage to surrounding properties	Capital Improvements Plan	2 years

City of Texas City Mitigation Actions (New Mitigation Actions)								
PROJECT TITLE AND DESCRIPTION	HAZARD ADDRESSED	PRIORITY	POTENTIAL FUNDING SOURCE	RESPONSIBLE AGENCY	TYPE OF ACTION	EFFECT ON NEW AND EXISTING BUILDINGS	INCORPORATION INTO EXISTING PLANS & PROCEDURES	TIMELINE
generators on all lift stations.	cal Storms, Lightning, Extreme Heat, Floods, Dam Levee Failure Hailstorms					during power outages.		
Flood Gate at Moses Lake - Built in 1966, the flood gate is a critical piece of infrastructure that protects the City from catastrophic storm surges. Design and implement critical improvements to Flood Gate, including electrical upgrades to generator upgrades that will ensure resiliency.	Hurricanes/Tropical Storms	High	FEMA HMA Grants, TWDB FIF program, City funds, USACE partnership funding	Galveston County, U.S. Army Corp of Engineers	Structure and infrastructure projects	Protects new and existing buildings by improving the flood gate at Moses Lake, ensuring continued operation during storm surges with upgraded electrical and generator systems.	Capital Improvement Plan, Emergency Operations Plan, Economic Development Plan, Comprehensive Plan	5 years
Design and Implement a Drone and Technology Enhancement Program for Police and Fire Departments	Wildfire, Windstorms, Extreme Winter Storms, Drought, Tornado, Hurricanes/Tropical Storms,	High	City funds	Texas City Emergency Management, Fire, and Police	Structure and infrastructure projects	Enhances emergency response capabilities by equipping police and fire departments	Emergency Operations Plan	6 months

City of Texas City Mitigation Actions (New Mitigation Actions)								
PROJECT TITLE AND DESCRIPTION	**HAZARD ADDRESSED**	**PRIORITY**	**POTENTIAL FUNDING SOURCE**	**RESPONSIBLE AGENCY**	**TYPE OF ACTION**	**EFFECT ON NEW AND EXISTING BUILDINGS**	**INCORPOR-ATION INTO EXISTING PLANS & PROCEDURES**	**TIMELINE**
	Lightning, Extreme Heat, Floods, Dam Levee Failure Hailstorms					with advanced drone technology, improving situational awareness and reducing risks to both existing and new buildings during emergencies.		

Section 18: Plan Maintenance Procedures

Plan Maintenance Procedures

The following is an explanation of how the Planning Team will implement the Hazard Mitigation Action Plan and continue to evaluate and enhance it over time. In order to ensure that the Plan remains current and relevant, the following plan maintenance procedures will be addressed:

- Ensure the mitigation strategy remains current and is implemented according to Plan procedures.
- Secure and maintain an ongoing mitigation program throughout the community.
- Integrate short and long-term mitigation objectives into community officials' daily roles and responsibilities.
- Continued Public Involvement and maintain momentum by routine engagement of the Plan's progress.

Monitoring, Evaluation & Updating

Periodic tracking of the Plan is required to ensure that the goals, objectives, and mitigation action plans are implemented over time. Revisions may be necessary to ensure that the Plan is in full compliance with federal regulations and state statutes. This section outlines the procedures for completing such revisions, updates, and Plan review. Table 18-1 indicates the department or title responsible for this action.

Table 18-1. Team Members Responsible for Plan Maintenance

Title
Manager and Homeland Security Director
Director, Community Development & Grant Administration
Assistant Emergency Manager
Public Works Director
Floodplain Manager
Engineering & Planning, City Engineer, Director
Fire Marshall

Monitoring

The Hazard Mitigation planning team will convene a meeting annually to monitor the plan and track the status of each mitigation actions over the 5-year cycle of the Plan. Mitigation Actions will be assigned to team members in advance of the meetings to prepare status reports to share with the team. Mitigation action status updates will include continued feasibility for implementation and funding.

Evaluation

The City of Texas City will evaluate changes in risk, determine whether the implementation of mitigation actions is on schedule, or if there are any implementation issues such as changes in stated purposes or goals that affect mitigation priorities. The Plan Maintenance group will meet on an annual basis to identify any needed changes in the Plan based upon their evaluation activities.

Updating

Annual reports submitted by the designated Team members from the community evaluating the Plan will be used to keep the Plan updated.

Five Year Review

The Plan will be thoroughly reviewed by the appointed Planning Team at the end of three years from the approval date to determine whether there have been any significant changes in the area that may necessitate changes in the types of mitigation actions proposed. The City of Texas City will begin the update process 2 years prior to plan expiration. New flood studies and new development in flood-prone areas, an increased exposure to hazards, disaster declarations, the increase or decrease in capability to address hazards, and changes to federal or state regulations are examples of factors that may affect the content of the Plan.

The Plan review provides the Planning Team an opportunity to evaluate those actions that have been successful and to explore documenting potential losses avoided due to the implementation of specific mitigation measures. The Plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned. It is recommended that the Planning Team meet to review the Plan at the end of three years as grant funds may be necessary for the development of a five-year update. Due to the timelines for grant cycles, it is wise to begin planning grant options in advance of the five-year deadline. Following the review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and Plan amendment process outlined herein. Upon completion of the review and update/amendment process, the revised Plan will be submitted to TDEM for final review and approval in coordination with FEMA.

Incorporating the Plan into Other Planning Mechanisms

The City of Texas City will work to integrate the hazard mitigation strategies into other planning mechanisms. The Planning Team will ensure that future growth, disaster recovery, historic preservation, flood response plans, and other planning mechanisms will be consistent with the goals of the Plan. Historically, the previous Hazard Mitigation Plan was not well integrated into other planning mechanisms.

To ensure successful integration of this plan update, key Planning Team members will meet annually, and more often if warranted, to ensure mitigation actions prioritized as high to moderate are tracked and monitored based on federal Disaster Declarations, HMGP and PDM funding cycles, and other non-federal funding sources that would help communities meet the local HMA match.

The potential funding sources listed for each identified action may be used when the Planning Team member begins to seek funds to implement actions. An implementation time period, or a specific implementation date, has been assigned to each action as an incentive for completing each task and gauging whether actions are implemented in a timely manner.

Existing plans for the City of Texas City will be reviewed in light of the Plan, and Team Members will incorporate any mitigation policies and actions into these plans as appropriate. Table 20-1 indicates Planning Team member roles for incorporating actions, method of incorporation, and approving authority. Table 18-2 identifies planning mechanisms available for the City of Texas City and provides examples of how the Plan will be incorporated into current efforts.

Table 18-2. Planning Mechanisms and Method to Incorporate into the Plan

Existing Planning Mechanism	Method Of Use In Hazard Mitigation Plan
Annual Budget	Funding mitigation projects and local match requirements
Emergency Planning and Emergency Operations Plan	Identifying hazards and assessing vulnerabilities
Mutual Aid Agreements	Assessing vulnerabilities/needs
Floodplain Ordinance/ Stormwater Management	Mitigation strategies; higher regulatory considerations
Land Use Maps and New Flood Studies	Assessing vulnerabilities and flood risk; development trends; long-term growth
Critical Facilities	Location and protection
Building and Zoning Codes	Development trends; future growth
State Hazard Mitigation Plan	Risk analysis

It will be the responsibility of The City of Texas City to determine department or title of personnel responsible for implementation of mitigation strategies and implementation procedures.

The City of Texas City will comply with local and state requirements while incorporating this Plan into existing planning mechanisms. Table 20-3 identifies existing hazard mitigation capabilities to support mitigation actions. The existing hazard mitigation capabilities consist of existing building codes, land use ordinances, and regulatory plans. A list of planning mechanisms and capabilities available to the City of Texas City can be found in Appendix E. The mitigation actions in Section 19 describe the planning mechanisms into which the mitigation actions will be integrated. In the process of integrating the mitigation actions into new and existing planning mechanisms. The City of Texas City will present new and existing planning mechanisms to the City Council. Upon approval by the City Council, approved actions will be acted upon and/or integrated into existing planning mechanisms.

Existing Policies, Programs & Resources

The City has existing capabilities through policy, programs, ordinance, and other capabilities available to reduce risk and improve resilience. As the City moves through enacting mitigation actions, and ongoing plan maintenance, opportunities to expand and improve these capabilities will be investigated. The City has authority to adjust budgets, adopt plans, write ordinances, and enact policies. Information on the expansion and improvement of capabilities is presented below.

Planning Mechanism	Integration & Expansion – City of Texas City
City Staff	Staff are involved in the planning process and the implementation of mitigation actions. Staff will be able to help planning team members, serve as stakeholders, and coordinate the monitoring and maintenance process of this Plan.
Annual Budget Review	The City of Texas City will have an annual budget review. The city will incorporate the Plan while conducting their annual budget reviews. High priority mitigation actions will be reviewed and may potentially receive funds to implement actions.
Stormwater Management Plan / Ordinance	The Plan will be consulted when updating and maintaining the City's stormwater management plan. Both documents share the goal of reducing damage and minimizing the negative impacts of development on stormwater.

Planning Mechanism	Integration & Expansion – City of Texas City
Emergency Operations Plan	The Plan will be consulted when updating and maintaining the City's Emergency Operations Plan. Both documents share the goal of public safety. Many of the mitigation actions in this Plan relate to emergency operations and must be integrated.
Capital Improvement Plan	Many of the mitigation actions found in this Plan will be enacted through capital improvement projects. Consequently, the City's Capital Improvement Plan must consult the Plan for hazard mitigation projects that could be incorporated into the Capital Improvement Plan. Prioritization should be given to high priority actions.
Floodplain Ordinance	The ordinances will be used in updating the floodplain ordinance and ensuring sound floodplain management. The goals of both documents are to reduce vulnerability to flooding hazards. The Plan will be consulted for NFIP compliance, flood risk, and extent. Information from this Plan will be reviewed for inclusion in other documents, including the floodplain ordinance.
Comprehensive/Master Plan	The Plan will be consulted when updating the Comprehensive/Master Plan. It is important to ensure that development occurs in a manner that does not increase hazard risk. The Plan includes information regarding the location, extent, and probability of many natural hazards. By incorporating this information into the Comprehensive/Master Plan, development can be guided in a hazard-resilient manner.

Planning Mechanism	Integration & Expansion – City of Texas City
Stormwater Ordinance	The Plan will be consulted when updating and maintaining the City's stormwater ordinance. The goal of reducing damage and minimizing the negative impacts of development on stormwater.
Economic Development Plan	The Plan will be consulted during economic development. The goal of the plan is to have framework and regulation for economic growth in the city.
Zoning Ordinance	Zoning ordinances will regulate city development by creating a regulated approach to development in the City.

Continued Public Involvement

Input from the stakeholders and public was an integral part of the preparation of this Plan and will continue as the Plan grows and changes. This Plan will be posted on the City of Texas City website where local officials and the public will be invited to provide ongoing feedback. The task of notifying stakeholders and community members on an annual basis will be held with the identified Planning Team members tasked with updates and annual Plan review. The Planning Team will have the added task of maintaining the Plan as a part of their job description. Media such as the local newspaper and radio stations will be used to notify the public of any maintenance or periodic review activities taking place. Public participation will be sought during the implementation, monitoring, and evaluation phases of the plan.

Appendix A: Meeting Documentation

Table of Contents

Public Announcements

Press Release Posted on City of Texas City Website: https://texascitytx.gov/

Texas City
EST. 1911

January 9, 2025
FOR IMMEDIATE RELEASE

FOR MORE INFORMATION:
Joe Tumbleson– (409) 229-1660

Texas City develops Texas City Hazard Mitigation Plan; hosts meeting and survey for public input

The Texas City Office of Emergency Management has identified natural disaster risks and vulnerabilities that are common in our area and is creating a plan to minimize the impact of those disasters and to protect people and property in the community.

The plan is the FEMA Hazard Mitigation Plan, and the City of Texas City will hold a virtual public meeting on Friday, January 24, 2025, to update the public on the project and gather community input for it. The public, area businesses and organizations located throughout the City and surrounding areas are invited and encouraged to attend.

Hazard Mitigation planning is an initiative to lessen the impact of natural hazards that the City of Texas City faces. During the meeting, the results of the Vulnerability Assessment from the City will be reviewed and the mitigation action requirements will be explained.

In addition to the meeting, the City of Texas City is also requesting public feedback through a short, online survey, available at: https://www.surveymonkey.com/r/CityofTexasCity

By participating in this meeting and/or the survey, residents and stakeholders can represent their community and give valuable experiences and ideas to the mitigation strategies planning process.

After compiling public input, the next step is to develop mitigation projects for each hazard that affects the City. By completing an approved Hazard Mitigation Plan, not only does the City of Texas City help to minimize the impact of natural disasters, but also opens a stream of grant funds for the City that will benefit the area.

The City will seek to ensure that the public, businesses, and other stakeholders remain aware of the planning process and are given an opportunity to participate and comment. This includes making components of the Draft plan available for public review and comment in advance of any formal consideration or approval.

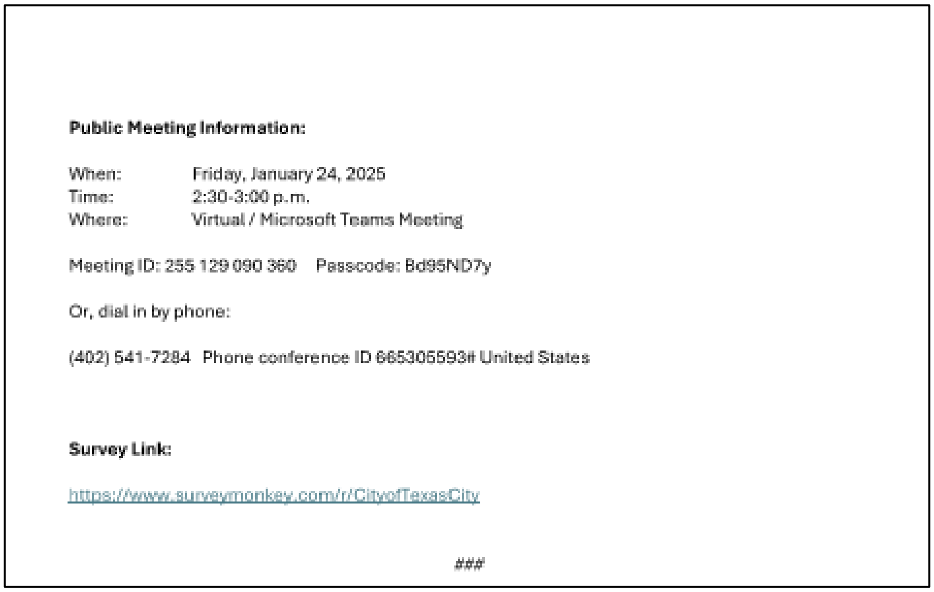
Detailed information about the planning process can be obtained by contacting Tak Makino, Project Manager with LAN Engineering at (713) 821-0359.

-more-

"the place where COMMUNITY MATTERS"

1801 9th Avenue North * P.O. Drawer 2608 * Texas City, TX 77592-2608
(409) 948-3111 * www.texascitytx.gov

Press release (continued)



Public Meeting Information:

When: Friday, January 24, 2025
Time: 2:30-3:00 p.m.
Where: Virtual / Microsoft Teams Meeting

Meeting ID: 255 129 090 360 Passcode: Bd95ND7y

Or, dial in by phone:

(402) 541-7284 Phone conference ID 665305593# United States

Survey Link:

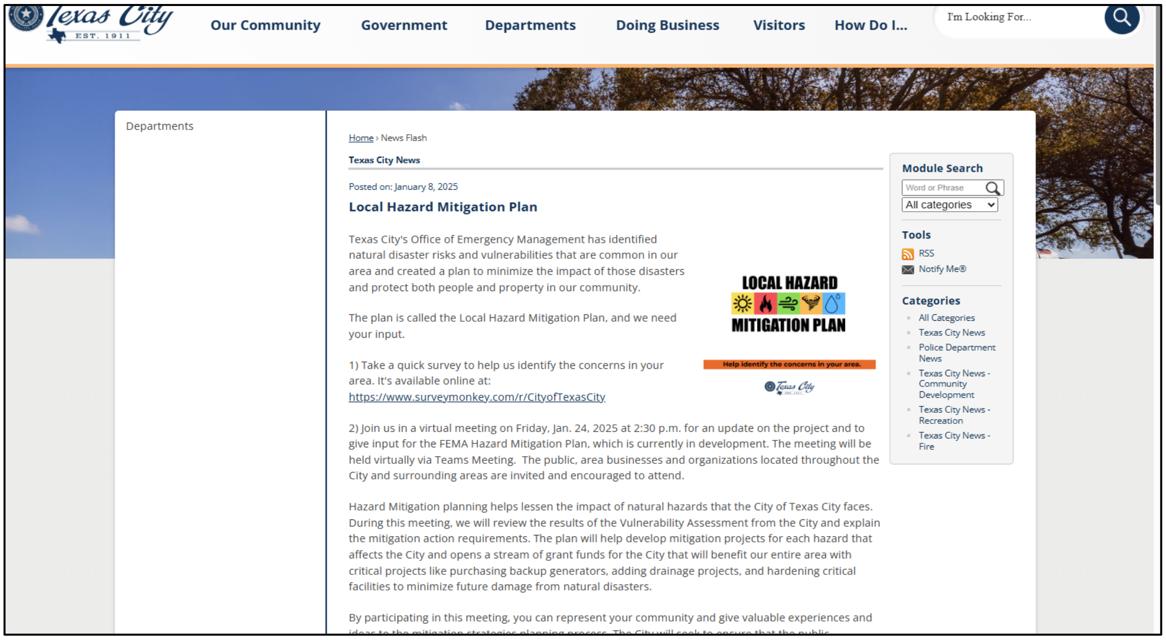
https://www.surveymonkey.com/r/CityofTexasCity

###

Additional places shared:

- City Hall lobby information table
- Chamber of Commerce for inclusion in their weekly emails
- City Secretary's Office for posting on the public notices bulletin board
- Announced at the City Commission meeting on January 8, 2025
- Press release sent to 34 local media contact on January 8. 2025, ranging from Galveston County newspapers to online sources to Houston radio and TV stations

Posted on the City of Texas City Website



Texas City News

Posted on: January 8, 2025

Local Hazard Mitigation Plan

Texas City's Office of Emergency Management has identified natural disaster risks and vulnerabilities that are common in our area and created a plan to minimize the impact of those disasters and protect both people and property in our community.

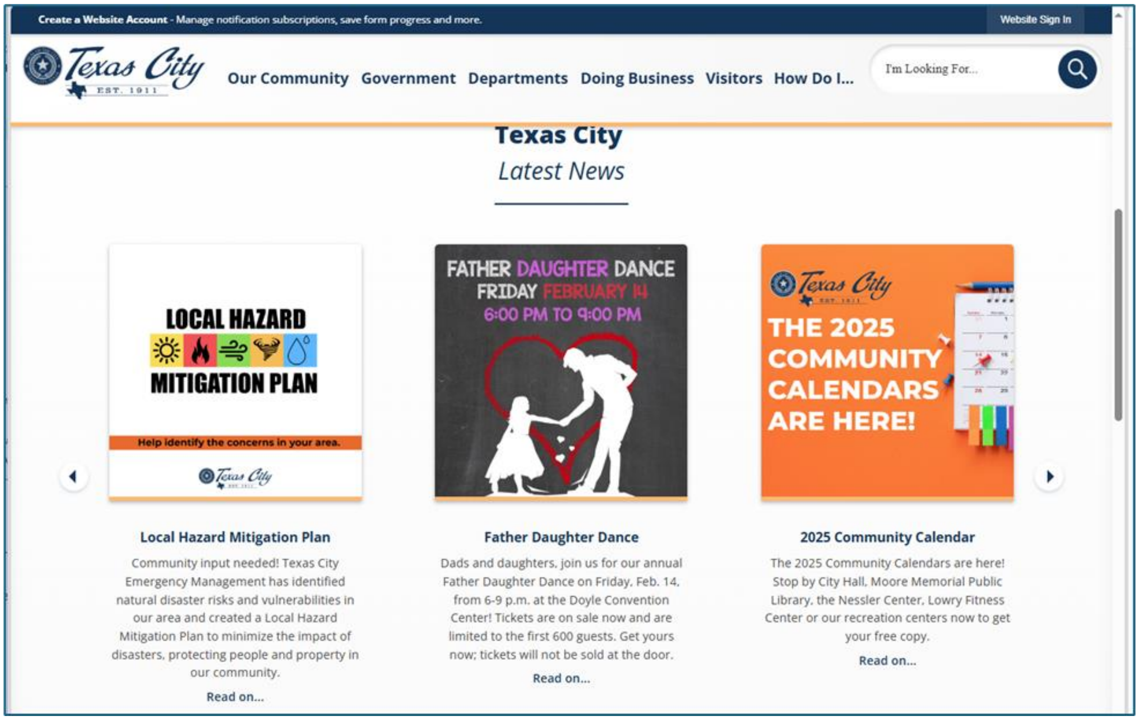
The plan is called the Local Hazard Mitigation Plan, and we need your input.

1) Take a quick survey to help us identify the concerns in your area. It's available online at: https://www.surveymonkey.com/r/CityofTexasCity

2) Join us in a virtual meeting on Friday, Jan. 24, 2025 at 2:30 p.m. for an update on the project and to give input for the FEMA Hazard Mitigation Plan, which is currently in development. The meeting will be held virtually via Teams Meeting. The public, area businesses and organizations located throughout the City and surrounding areas are invited and encouraged to attend.

Hazard Mitigation planning helps lessen the impact of natural hazards that the City of Texas City faces. During this meeting, we will review the results of the Vulnerability Assessment from the City and explain the mitigation action requirements. The plan will help develop mitigation projects for each hazard that affects the City and opens a stream of grant funds for the City that will benefit our entire area with critical projects like purchasing backup generators, adding drainage projects, and hardening critical facilities to minimize future damage from natural disasters.

By participating in this meeting, you can represent your community and give valuable experiences and



Texas City

Latest News

Local Hazard Mitigation Plan

Community input needed! Texas City Emergency Management has identified natural disaster risks and vulnerabilities in our area and created a Local Hazard Mitigation Plan to minimize the impact of disasters, protecting people and property in our community.

Read on...

Father Daughter Dance

Dads and daughters, join us for our annual Father Daughter Dance on Friday, Feb. 14, from 6-9 p.m. at the Doyle Convention Center! Tickets are on sale now and are limited to the first 600 guests. Get yours now; tickets will not be sold at the door.

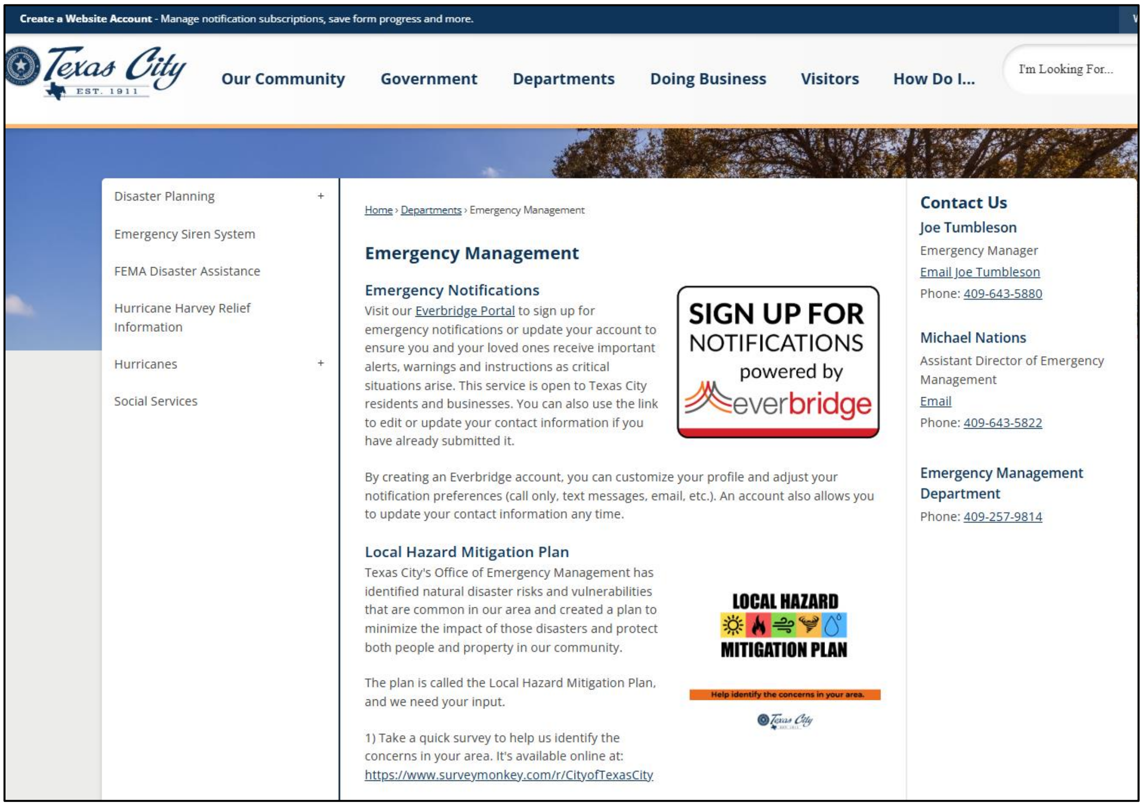
Read on...

2025 Community Calendar

The 2025 Community Calendars are here! Stop by City Hall, Moore Memorial Public Library, the Nessler Center, Lowry Fitness Center or our recreation centers now to get your free copy.

Read on...

Posted on City Website's Emergency Management Page



Emergency Management

Emergency Notifications

Visit our Everbridge Portal to sign up for emergency notifications or update your account to ensure you and your loved ones receive important alerts, warnings and instructions as critical situations arise. This service is open to Texas City residents and businesses. You can also use the link to edit or update your contact information if you have already submitted it.

By creating an Everbridge account, you can customize your profile and adjust your notification preferences (call only, text messages, email, etc.). An account also allows you to update your contact information any time.

Local Hazard Mitigation Plan

Texas City's Office of Emergency Management has identified natural disaster risks and vulnerabilities that are common in our area and created a plan to minimize the impact of those disasters and protect both people and property in our community.

The plan is called the Local Hazard Mitigation Plan, and we need your input.

1) Take a quick survey to help us identify the concerns in your area. It's available online at: https://www.surveymonkey.com/r/CityofTexasCity

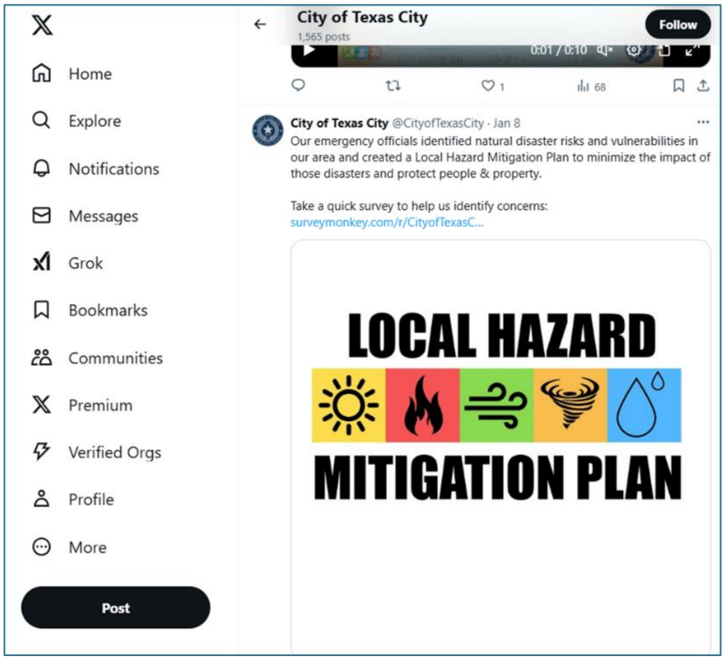
Contact Us

Joe Tumbleson
Emergency Manager
Email Joe Tumbleson
Phone: 409-643-5880

Michael Nations
Assistant Director of Emergency Management
Email
Phone: 409-643-5822

Emergency Management Department
Phone: 409-257-9814

Posted on "X" Social Media Page



City of Texas City @CityofTexasCity · Jan 8

Our emergency officials identified natural disaster risks and vulnerabilities in our area and created a Local Hazard Mitigation Plan to minimize the impact of those disasters and protect people & property.

Take a quick survey to help us identify concerns: surveymonkey.com/r/CityofTexasC...

Posted on City of Texas City Instagram Page

cityoftexascity_
Texas City, Texas

cityoftexascity_ Our Texas City Emergency Management has identified natural disaster risks and vulnerabilities that are common in our area and created a plan to minimize the impact of those disasters and protect both people and property in our community.

The plan is called the Local Hazard Mitigation Plan, and we need your input.

1) Take a quick survey to help us identify the concerns in your area. It's available online at: https://www.surveymonkey.com/r/CityofTexasCity

2) Join us in a virtual meeting on Friday, Jan. 24, 2024 at 2:30 p.m. Local businesses, organizations and the entire community are encouraged to attend.

Teams meeting ID:
255 129 090 360
passcode: Bd95ND7y

1d

Posted on Texas City of Emergency Management Facebook Page

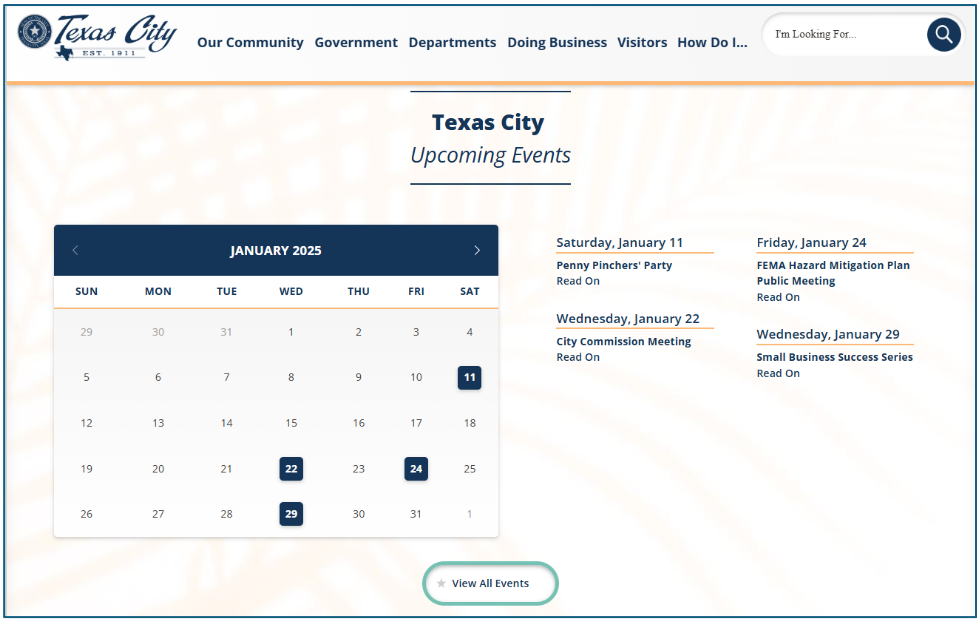
Texas City Emergency Management
January 8 at 10:05 AM

Texas City Emergency Management has identified natural disaster risks and vulnerabilities that are common in our area and created a plan to minimize the impact of those disasters and protect both people and property in our community.

The plan is called the Local Hazard Mitigation Plan, and we need your input.

1) Take a quick survey to help us identify the concerns in your area. It's available online at: https://www.surveymonkey.com/r/CityofTexasCity... **See more**

Posted on the City of Texas City Calendar



Texas City
Upcoming Events

JANUARY 2025

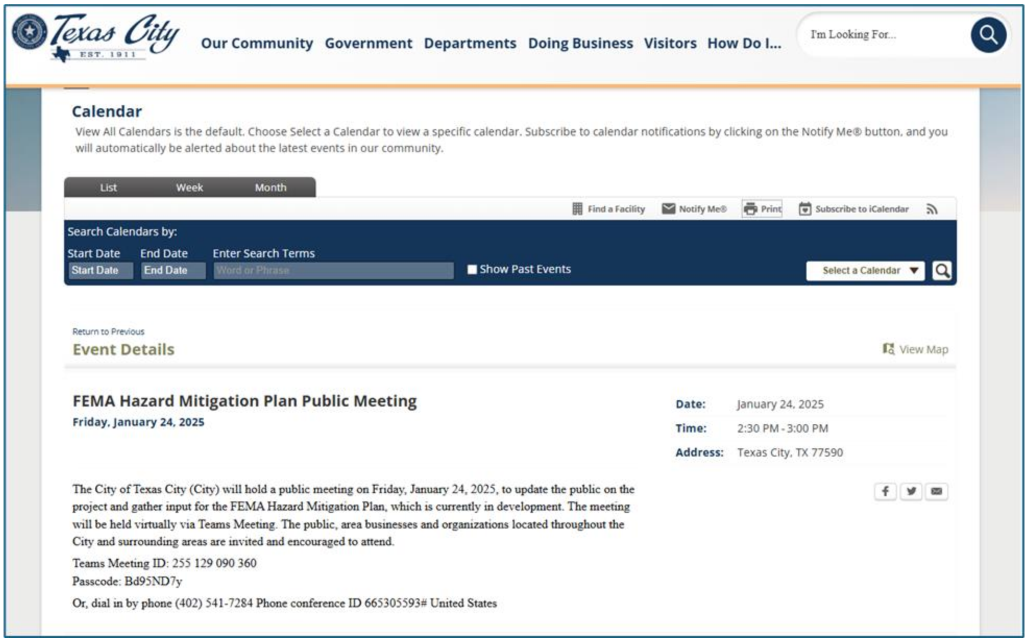
SUN	MON	TUE	WED	THU	FRI	SAT
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1

Saturday, January 11
Penny Pinchers' Party
Read On

Wednesday, January 22
City Commission Meeting
Read On

Friday, January 24
FEMA Hazard Mitigation Plan Public Meeting
Read On

Wednesday, January 29
Small Business Success Series
Read On



Calendar

View All Calendars is the default. Choose Select a Calendar to view a specific calendar. Subscribe to calendar notifications by clicking on the Notify Me® button, and you will automatically be alerted about the latest events in our community.

Event Details

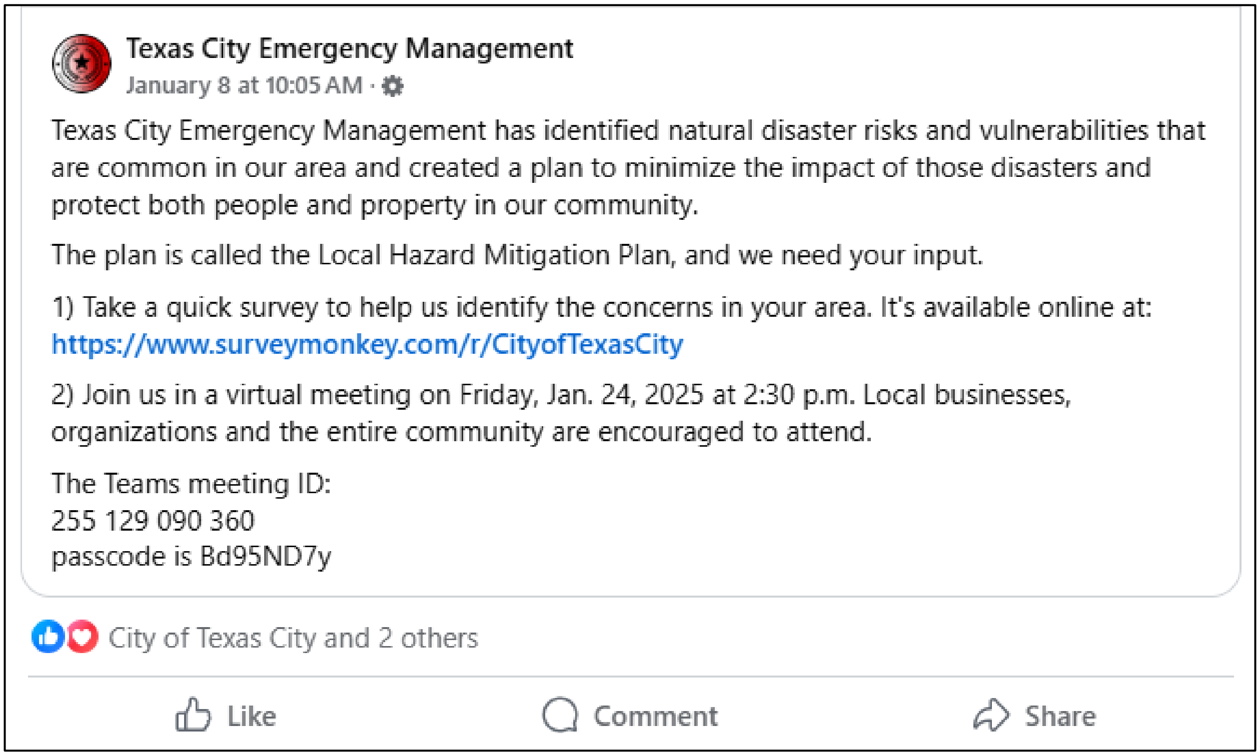
FEMA Hazard Mitigation Plan Public Meeting
Friday, January 24, 2025

Date: January 24, 2025
Time: 2:30 PM - 3:00 PM
Address: Texas City, TX 77590

The City of Texas City (City) will hold a public meeting on Friday, January 24, 2025, to update the public on the project and gather input for the FEMA Hazard Mitigation Plan, which is currently in development. The meeting will be held virtually via Teams Meeting. The public, area businesses and organizations located throughout the City and surrounding areas are invited and encouraged to attend.

Teams Meeting ID: 255 129 090 360
Passcode: Bd95ND7y
Or, dial in by phone (402) 541-7284 Phone conference ID 665305593# United States

Posted on the City of Texas City Emergency Management Facebook Page



Texas City Emergency Management

January 8 at 10:05 AM ·

Texas City Emergency Management has identified natural disaster risks and vulnerabilities that are common in our area and created a plan to minimize the impact of those disasters and protect both people and property in our community.

The plan is called the Local Hazard Mitigation Plan, and we need your input.

1) Take a quick survey to help us identify the concerns in your area. It's available online at: https://www.surveymonkey.com/r/CityofTexasCity

2) Join us in a virtual meeting on Friday, Jan. 24, 2025 at 2:30 p.m. Local businesses, organizations and the entire community are encouraged to attend.

The Teams meeting ID:
255 129 090 360
passcode is Bd95ND7y

City of Texas City and 2 others

Posted on the Moore Memorial Public Library Facebook Page

Moore Memorial Public Library

January 8 at 1:55 PM ·

Join The Texas City Emergency Management department for a virtual meeting on Friday, Jan. 24 at 2:30 p.m. Local businesses, organizations and the entire community are encouraged to attend.

Details in the post below.

Also, please take a moment to fill out a quick survey to help the TCEMD identify the concerns in our area. It's available online at: https://www.surveymonkey.com/r/CityofTexasCity

City of Texas City Press Release

FOR IMMEDIATE RELEASE
Contact: Tak Makino
LAN Engineering
Date: 2/10/2025

FEMA Hazard Mitigation Plan Public Meeting
March 6, 2025

The City of Texas City (City) will hold a public meeting on Thursday, March 6, 2025, to update the public on the project and gather input for the FEMA Hazard Mitigation Plan, which is currently in development. The meeting will be held virtually via Teams Meeting and in the Meeting Room at the Moore Memorial Public Library for in-person participation for those without digital access. The public, area businesses and organizations located throughout the City and surrounding areas are invited and encouraged to attend.

Hazard Mitigation planning is an initiative to lessen the impact of natural hazards that the City of Texas City faces. During this meeting, we will review the results of the Vulnerability Assessment from the City and explain the mitigation action requirements from FEMA. The next step is to develop mitigation projects for each hazard that affects the City. Best of all, completing an approved Hazard Mitigation Plan will open a stream of funds for the City that will benefit the area.

By participating in this meeting, you can represent your community and give valuable experiences and ideas to the mitigation strategies planning process. The City will seek to ensure that the public, businesses, and other stakeholders remain aware of the planning process and are given an opportunity to participate and comment. This includes making components of the Draft plan available for public review and comment in advance of any formal consideration or approval.

Public Meeting Information:

When: **Thursday, March 6, 2025**
Time: **3:30-4:00 p.m.**
Where: **Virtually via Microsoft Teams Meeting or Moore Memorial Public Library**

Join virtually via Microsoft Teams: Download Teams | Join on the web

Meeting ID: 215 867 535 270
Passcode: RK9Sq3x7

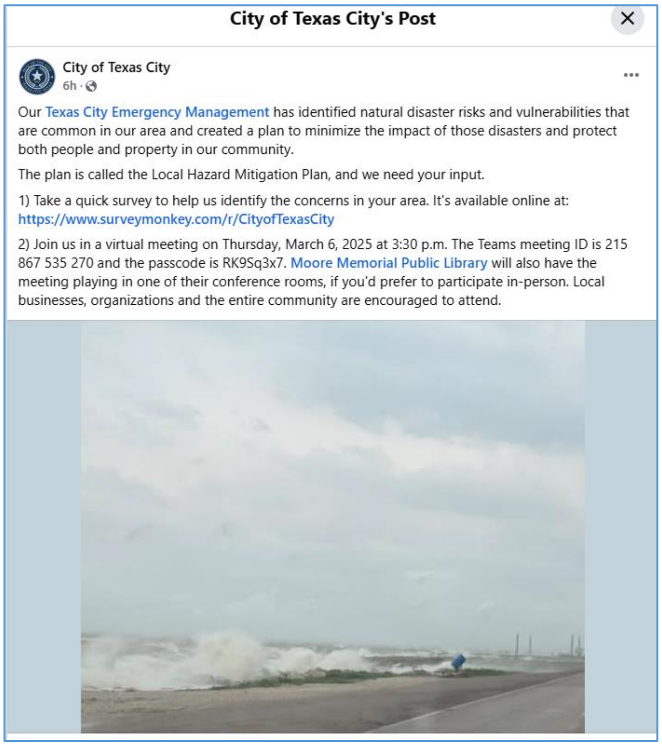
Or, call in (audio only)
+1 402-541-7284 Phone Conference ID: 423562647#

For those without digital access, you can join a live stream of the meeting in person at:

Moore Memorial Public Library (Meeting Room) 1701 9th Avenue North, Texas City, TX 77590

Detailed information about the planning process can be obtained by contacting Tak Makino, Project Manager, LAN Engineering, 713-821-0359

Posted on the City of Texas City Facebook Page



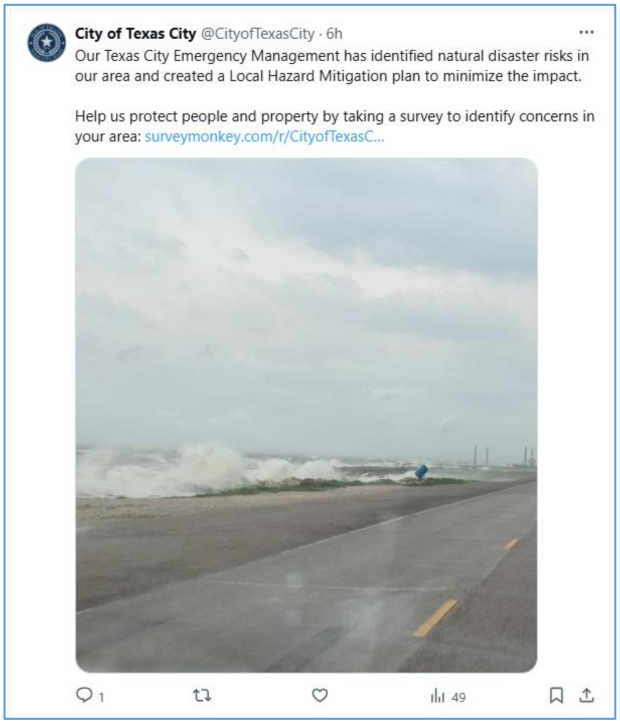
Our Texas City Emergency Management has identified natural disaster risks and vulnerabilities that are common in our area and created a plan to minimize the impact of those disasters and protect both people and property in our community.

The plan is called the Local Hazard Mitigation Plan, and we need your input.

1) Take a quick survey to help us identify the concerns in your area. It's available online at: https://www.surveymonkey.com/r/CityofTexasCity

2) Join us in a virtual meeting on Thursday, March 6, 2025 at 3:30 p.m. The Teams meeting ID is 215 867 535 270 and the passcode is RK9Sq3x7. Moore Memorial Public Library will also have the meeting playing in one of their conference rooms, if you'd prefer to participate in-person. Local businesses, organizations and the entire community are encouraged to attend.

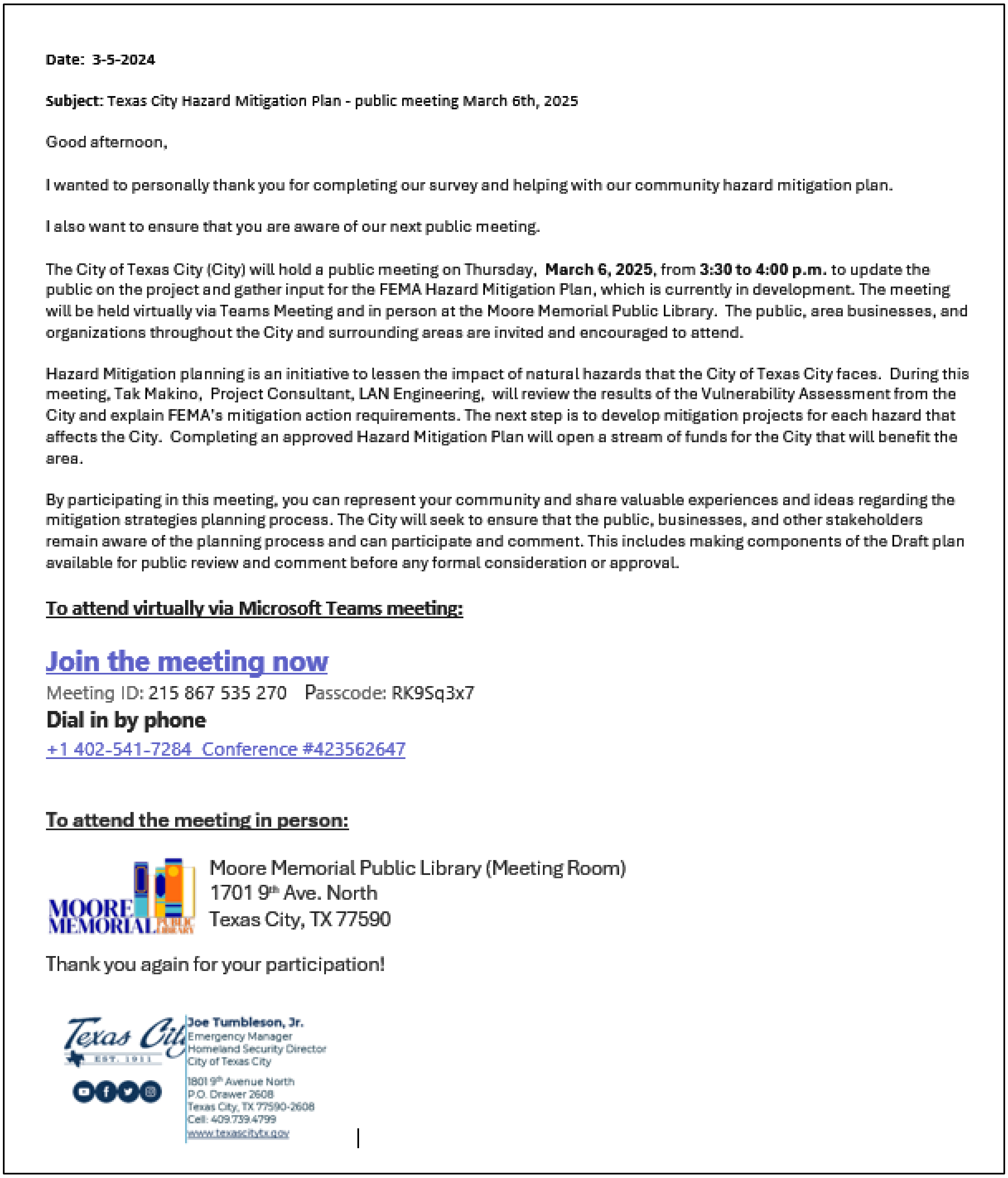
Posted on "X" Social Media page for City of Texas City



Our Texas City Emergency Management has identified natural disaster risks in our area and created a Local Hazard Mitigation plan to minimize the impact.

Help us protect people and property by taking a survey to identify concerns in your area: surveymonkey.com/r/CityofTexasC...

Email sent from Emergency Management Office to Public Survey Participants



Date: 3-5-2024

Subject: Texas City Hazard Mitigation Plan - public meeting March 6th, 2025

Good afternoon,

I wanted to personally thank you for completing our survey and helping with our community hazard mitigation plan.

I also want to ensure that you are aware of our next public meeting.

The City of Texas City (City) will hold a public meeting on Thursday, **March 6, 2025**, from **3:30 to 4:00 p.m.** to update the public on the project and gather input for the FEMA Hazard Mitigation Plan, which is currently in development. The meeting will be held virtually via Teams Meeting and in person at the Moore Memorial Public Library. The public, area businesses, and organizations throughout the City and surrounding areas are invited and encouraged to attend.

Hazard Mitigation planning is an initiative to lessen the impact of natural hazards that the City of Texas City faces. During this meeting, Tak Makino, Project Consultant, LAN Engineering, will review the results of the Vulnerability Assessment from the City and explain FEMA's mitigation action requirements. The next step is to develop mitigation projects for each hazard that affects the City. Completing an approved Hazard Mitigation Plan will open a stream of funds for the City that will benefit the area.

By participating in this meeting, you can represent your community and share valuable experiences and ideas regarding the mitigation strategies planning process. The City will seek to ensure that the public, businesses, and other stakeholders remain aware of the planning process and can participate and comment. This includes making components of the Draft plan available for public review and comment before any formal consideration or approval.

To attend virtually via Microsoft Teams meeting:

Join the meeting now

Meeting ID: 215 867 535 270 Passcode: RK9Sq3x7

Dial in by phone

+1 402-541-7284 Conference #423562647

To attend the meeting in person:

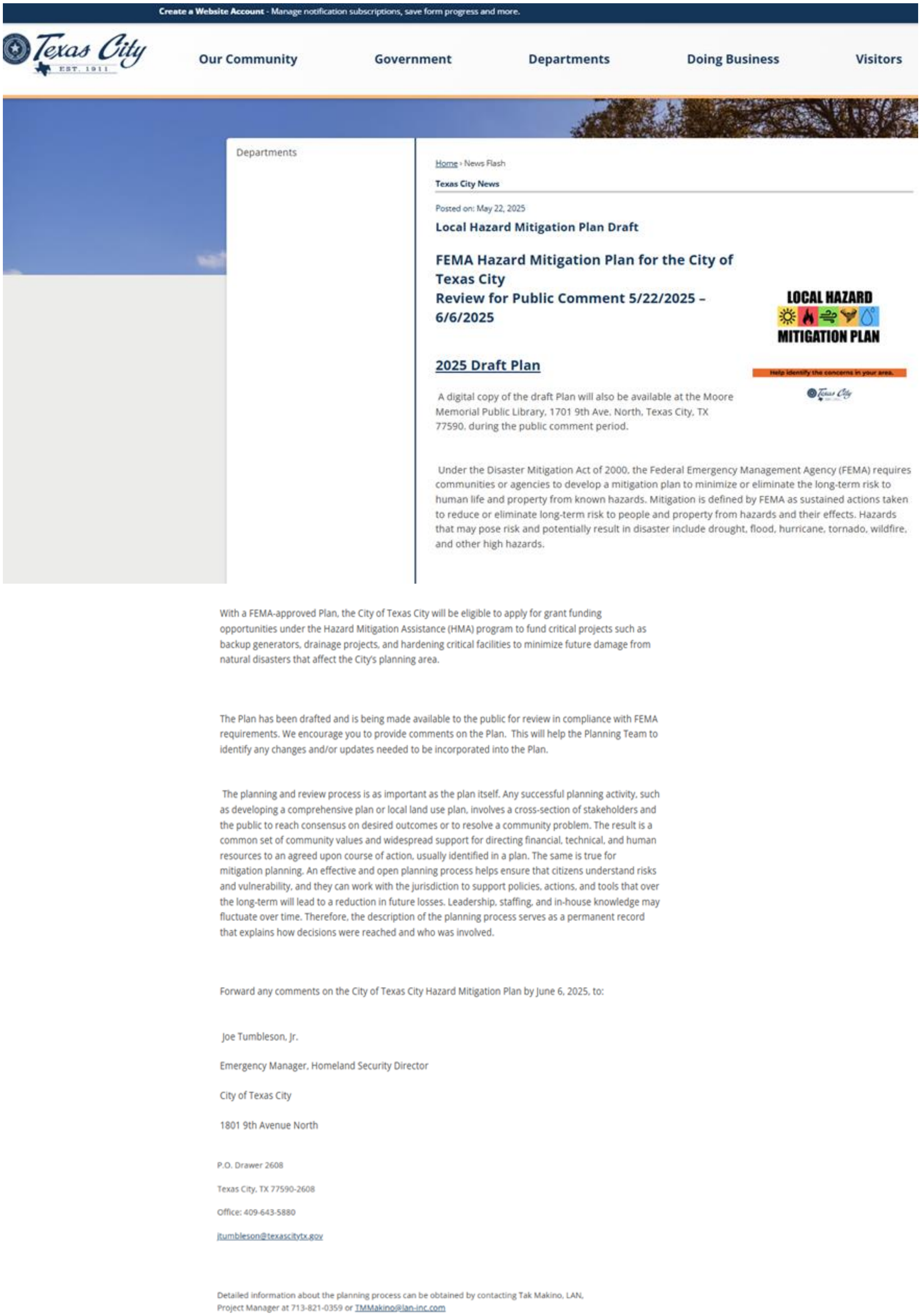
Moore Memorial Public Library (Meeting Room)
1701 9th Ave. North
Texas City, TX 77590

Thank you again for your participation!

Joe Tumbleson, Jr.
Emergency Manager
Homeland Security Director
City of Texas City

1801 9th Avenue North
P.O. Drawer 2608
Texas City, TX 77590-2608
Cell: 409.739.4799
www.texascitytx.gov

Press Release Posted on City of Texas City Website: https://texascitytx.gov/



Posted on: May 22, 2025

Local Hazard Mitigation Plan Draft

FEMA Hazard Mitigation Plan for the City of Texas City
Review for Public Comment 5/22/2025 – 6/6/2025

2025 Draft Plan

A digital copy of the draft Plan will also be available at the Moore Memorial Public Library, 1701 9th Ave. North, Texas City, TX 77590, during the public comment period.

Under the Disaster Mitigation Act of 2000, the Federal Emergency Management Agency (FEMA) requires communities or agencies to develop a mitigation plan to minimize or eliminate the long-term risk to human life and property from known hazards. Mitigation is defined by FEMA as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects. Hazards that may pose risk and potentially result in disaster include drought, flood, hurricane, tornado, wildfire, and other high hazards.

With a FEMA-approved Plan, the City of Texas City will be eligible to apply for grant funding opportunities under the Hazard Mitigation Assistance (HMA) program to fund critical projects such as backup generators, drainage projects, and hardening critical facilities to minimize future damage from natural disasters that affect the City's planning area.

The Plan has been drafted and is being made available to the public for review in compliance with FEMA requirements. We encourage you to provide comments on the Plan. This will help the Planning Team to identify any changes and/or updates needed to be incorporated into the Plan.

The planning and review process is as important as the plan itself. Any successful planning activity, such as developing a comprehensive plan or local land use plan, involves a cross-section of stakeholders and the public to reach consensus on desired outcomes or to resolve a community problem. The result is a common set of community values and widespread support for directing financial, technical, and human resources to an agreed upon course of action, usually identified in a plan. The same is true for mitigation planning. An effective and open planning process helps ensure that citizens understand risks and vulnerability, and they can work with the jurisdiction to support policies, actions, and tools that over the long-term will lead to a reduction in future losses. Leadership, staffing, and in-house knowledge may fluctuate over time. Therefore, the description of the planning process serves as a permanent record that explains how decisions were reached and who was involved.

Forward any comments on the City of Texas City Hazard Mitigation Plan by June 6, 2025, to:

Joe Tumbleson, Jr.

Emergency Manager, Homeland Security Director

City of Texas City

1801 9th Avenue North

P.O. Drawer 2608

Texas City, TX 77590-2608

Office: 409-643-5880

jtumbleson@texascitytx.gov

Detailed information about the planning process can be obtained by contacting Tak Makino, LAN, Project Manager at 713-821-0359 or TMMakino@lan-inc.com

Posted on Facebook Social Media page for City of Texas City

City of Texas City
May 22 at 7:00 PM ·

The FEMA Hazard Mitigation Plan for the City of Texas City has been drafted and is available for public review and comments on the City's website through 6/06/2025.
https://www.texascitytx.gov/CivicAlerts.aspx?AID=529

Posted on "X" Social Media page for City of Texas City 5/22/2025

cityoftexascity_ The FEMA Hazard Mitigation Plan for the City of Texas City has been drafted and is available for public review and comments on the City's website through 6/06/2025.

https://www.texascitytx.gov/CivicAlerts.aspx?AID=529

Kickoff Public Meeting Presentation, January 24, 2025

City of Texas City Hazard Mitigation Plan

Virtual Kickoff Meeting – January 24, 2025
Public Meeting

1

Agenda

1. Purpose
2. Planning Process / Roles & Responsibilities
3. Mitigation Strategy
4. Adoption/Implementation

2

Purpose

→ Prevent or reduce loss of life and property
→ Improve resilience
→ Identify cost-effective mitigation measures
→ Build stakeholder/public partnerships
→ Leverage FEMA funding
→ Protect critical economic hub

3

Public Input

→ Email: TMMakino@lan-inc.com
→ https://www.surveymonkey.com/r/CityofTexasCity

4

FEMA Hazard Mitigation Assistance

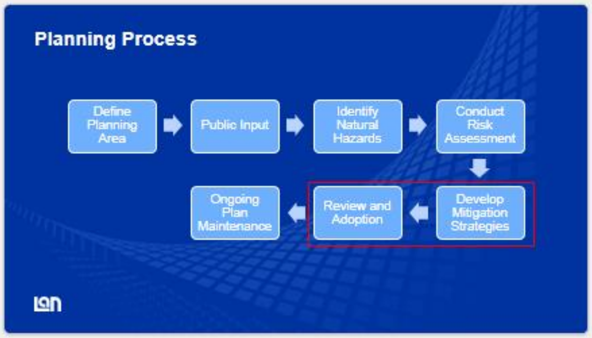
5

Planning Process

Define Planning Area → Public Input → Identify Natural Hazards → Conduct Risk Assessment → Develop Mitigation Strategies → Review and Adoption → Ongoing Plan Maintenance

6

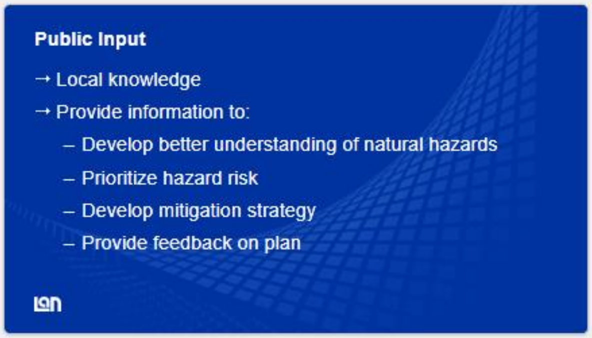
Kickoff public meeting presentation January 24, 2025 (continued)



Planning Process

Define Planning Area → Public Input → Identify Natural Hazards → Conduct Risk Assessment → Develop Mitigation Strategies → Review and Adoption → Ongoing Plan Maintenance

Planning Area



Public Input

- → Local knowledge
- → Provide information to:
  - – Develop better understanding of natural hazards
  - – Prioritize hazard risk
  - – Develop mitigation strategy
  - – Provide feedback on plan

Public Input

- → Email: TMMakino@lan-inc.com
- → https://www.surveymonkey.com/r/CityofTexasCity

Identify Natural Hazards

- → Floods
- → Hurricanes/ Tropical Storms
- → Wildfire
- → Tornado
- → Drought
- → Coastal Erosion
- → Dam/Levee Failure
- → Earthquake
- → Expansive Soils
- → Extreme Heat
- → Hailstorms
- → Land Subsidence
- → Extreme Winter Storm
- → Windstorms
- → Lightning

Risk Assessment / Data Collection

- → Identify natural hazards
  - – Previous occurrences
  - – Probability of future occurrences
- → Identify vulnerable assets
- → Identify impacts to assets

Kickoff public meeting presentation January 24, 2025 (continued)

Mitigation Strategy

- → Public survey question #12
- → Mitigation Actions
  - – At least two per hazard
- → Types
  - – Local Plans and Regulations
  - – Structural and Infrastructure
  - – Natural System Protection
  - – Education and Awareness

13

Adoption and Implementation

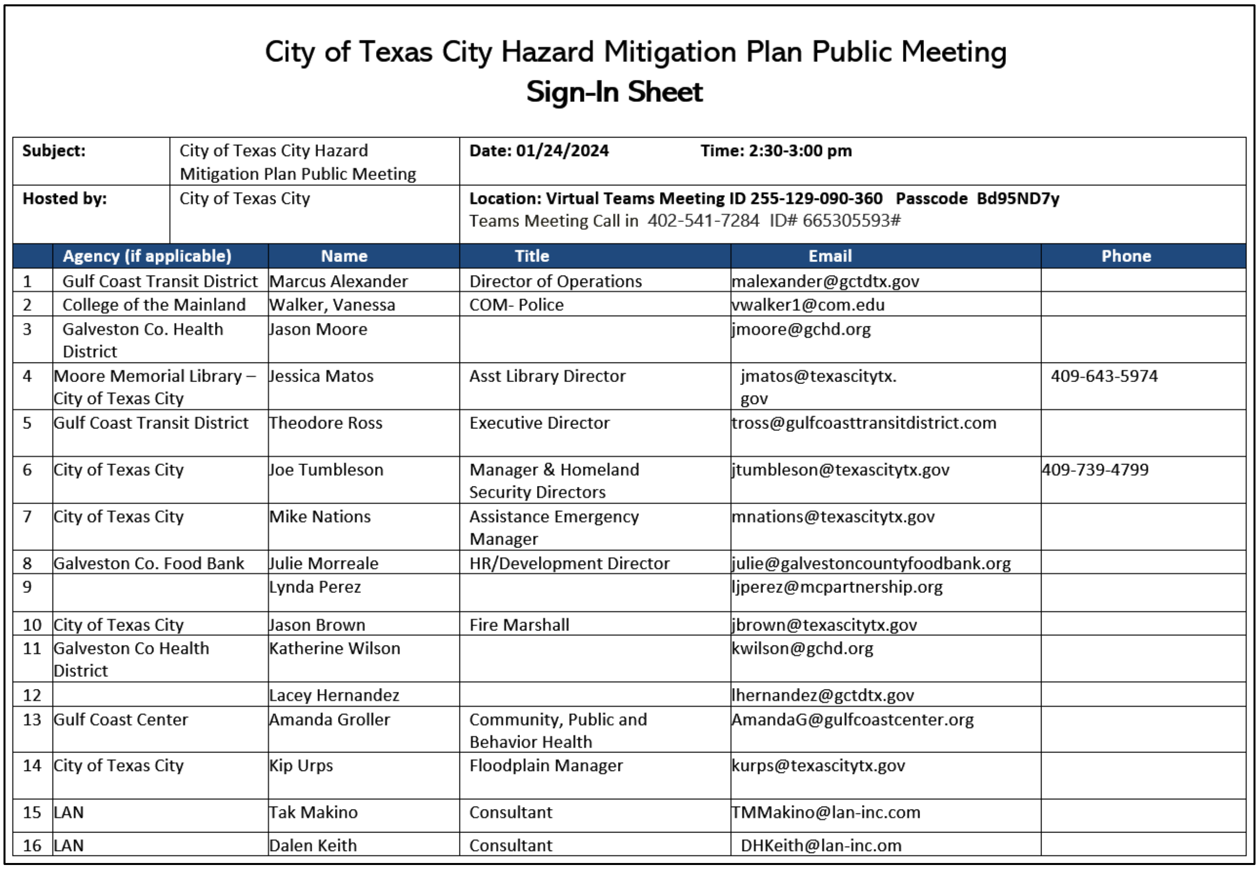
- → Adopted by governing body
  - – Following TDEM, FEMA review
- → Planning Team to review mitigation strategy annually
- → Update plan every five years

14

Questions

15

Kickoff Public Meeting Attendance, January 24, 2025



City of Texas City Hazard Mitigation Plan Public Meeting
Sign-In Sheet

Subject:	City of Texas City Hazard Mitigation Plan Public Meeting	**Date: 01/24/2024** **Time: 2:30-3:00 pm**
Hosted by:	City of Texas City	**Location: Virtual Teams Meeting ID 255-129-090-360 Passcode Bd95ND7y** Teams Meeting Call in 402-541-7284 ID# 665305593#

	Agency (if applicable)	Name	Title	Email	Phone
1	Gulf Coast Transit District	Marcus Alexander	Director of Operations	malexander@gctdtx.gov	
2	College of the Mainland	Walker, Vanessa	COM- Police	vwalker1@com.edu	
3	Galveston Co. Health District	Jason Moore		jmoore@gchd.org	
4	Moore Memorial Library – City of Texas City	Jessica Matos	Asst Library Director	jmatos@texascitytx. gov	409-643-5974
5	Gulf Coast Transit District	Theodore Ross	Executive Director	tross@gulfcoasttransitdistrict.com	
6	City of Texas City	Joe Tumbleson	Manager & Homeland Security Directors	jtumbleson@texascitytx.gov	409-739-4799
7	City of Texas City	Mike Nations	Assistance Emergency Manager	mnations@texascitytx.gov	
8	Galveston Co. Food Bank	Julie Morreale	HR/Development Director	julie@galvestoncountyfoodbank.org	
9		Lynda Perez		ljperez@mcpartnership.org	
10	City of Texas City	Jason Brown	Fire Marshall	jbrown@texascitytx.gov	
11	Galveston Co Health District	Katherine Wilson		kwilson@gchd.org	
12		Lacey Hernandez		lhernandez@gctdtx.gov	
13	Gulf Coast Center	Amanda Groller	Community, Public and Behavior Health	AmandaG@gulfcoastcenter.org	
14	City of Texas City	Kip Urps	Floodplain Manager	kurps@texascitytx.gov	
15	LAN	Tak Makino	Consultant	TMMakino@lan-inc.com	
16	LAN	Dalen Keith	Consultant	DHKeith@lan-inc.com	

Kickoff Planning Team Meeting Presentation, January 24, 2025

City of Texas City Hazard Mitigation Plan

Virtual Kickoff Meeting – January 24, 2025
Planning Team / Stakeholder Meeting

Agenda

1. Purpose
2. Planning Process / Roles & Responsibilities
3. Mitigation Strategy
4. Adoption/Implementation

Purpose

- → Prevent or reduce loss of life and property
- → Improve resilience
- → Identify cost-effective mitigation measures
- → Build stakeholder/public partnerships
- → Leverage FEMA funding
- → Protect critical economic hub

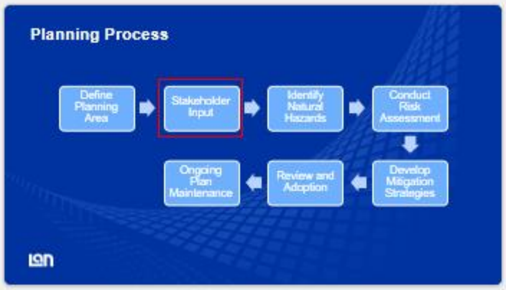
FEMA Local Mitigation Planning Policy Guide

FEMA Hazard Mitigation Assistance

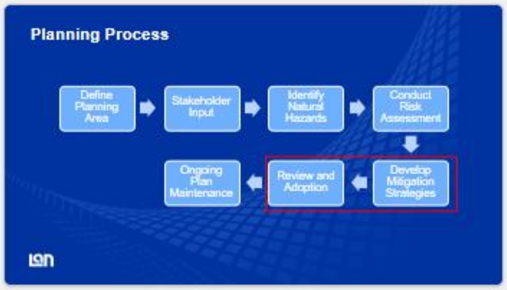
- → Building Resilient Infrastructure and Communities (BRIC)
  - – Annual
  - – 75/25 cost share
- → Flood Mitigation Assistance
  - – Annual
  - – 75/25 cost share
  - – Insured Structures

Planning Team Responsibilities

- → Participation in planning process
- → Provide historical data
- → Provide GIS data
- → Promote public engagement
- → Develop mitigation actions
- → Review draft plan and adopt final plan
- → Ongoing plan maintenance

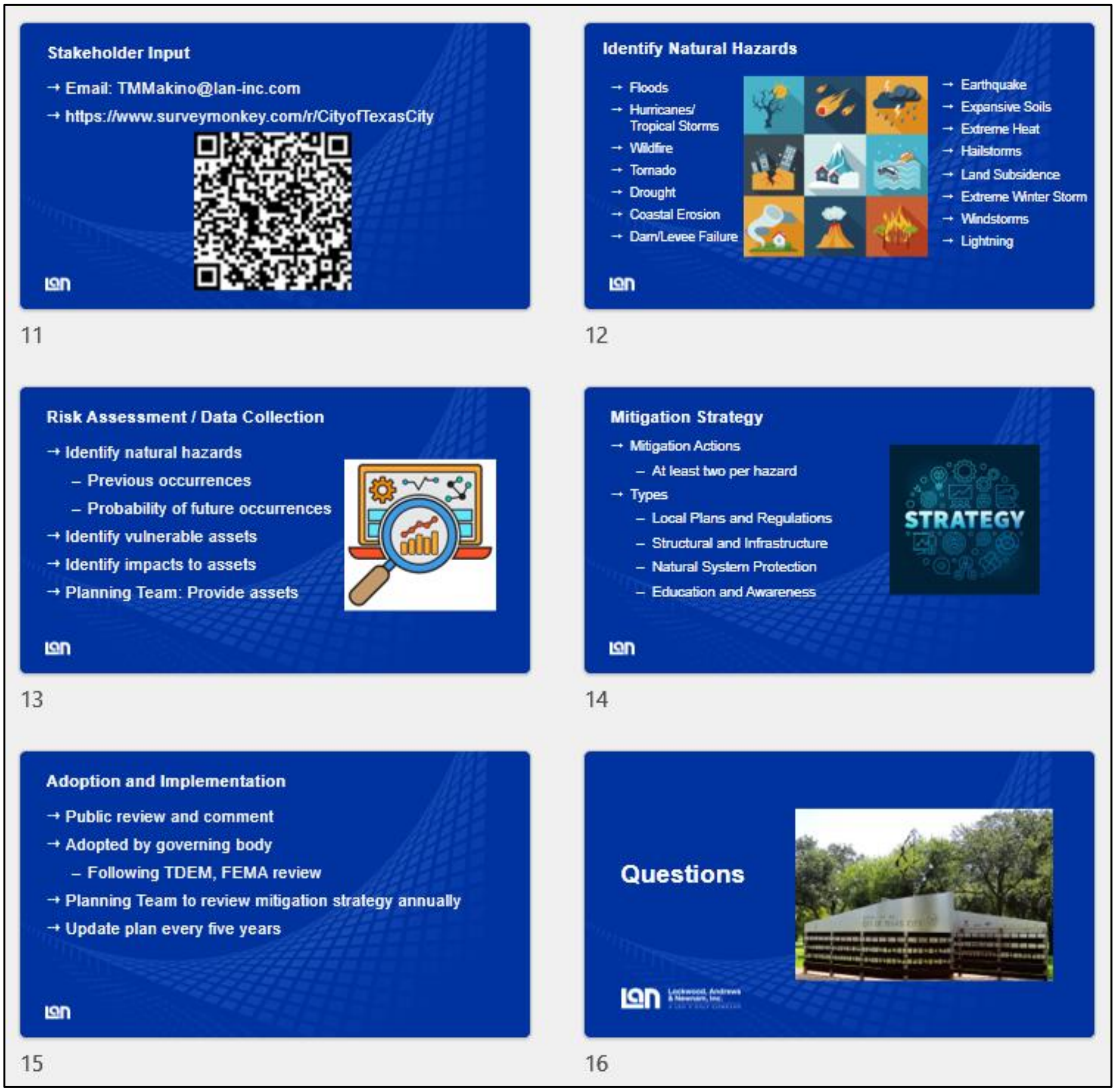


Planning Process



Planning Process

Kickoff Planning Team Meeting Presentation, January 24, 2025 (continued)



Stakeholder Input

- → Email: TMMakino@lan-inc.com
- → https://www.surveymonkey.com/r/CityofTexasCity

11

Identify Natural Hazards

- → Floods
- → Hurricanes/ Tropical Storms
- → Wildfire
- → Tornado
- → Drought
- → Coastal Erosion
- → Dam/Levee Failure
- → Earthquake
- → Expansive Soils
- → Extreme Heat
- → Hailstorms
- → Land Subsidence
- → Extreme Winter Storm
- → Windstorms
- → Lightning

12

Risk Assessment / Data Collection

- → Identify natural hazards
  - – Previous occurrences
  - – Probability of future occurrences
- → Identify vulnerable assets
- → Identify impacts to assets
- → Planning Team: Provide assets

13

Mitigation Strategy

- → Mitigation Actions
  - – At least two per hazard
- → Types
  - – Local Plans and Regulations
  - – Structural and Infrastructure
  - – Natural System Protection
  - – Education and Awareness

14

Adoption and Implementation

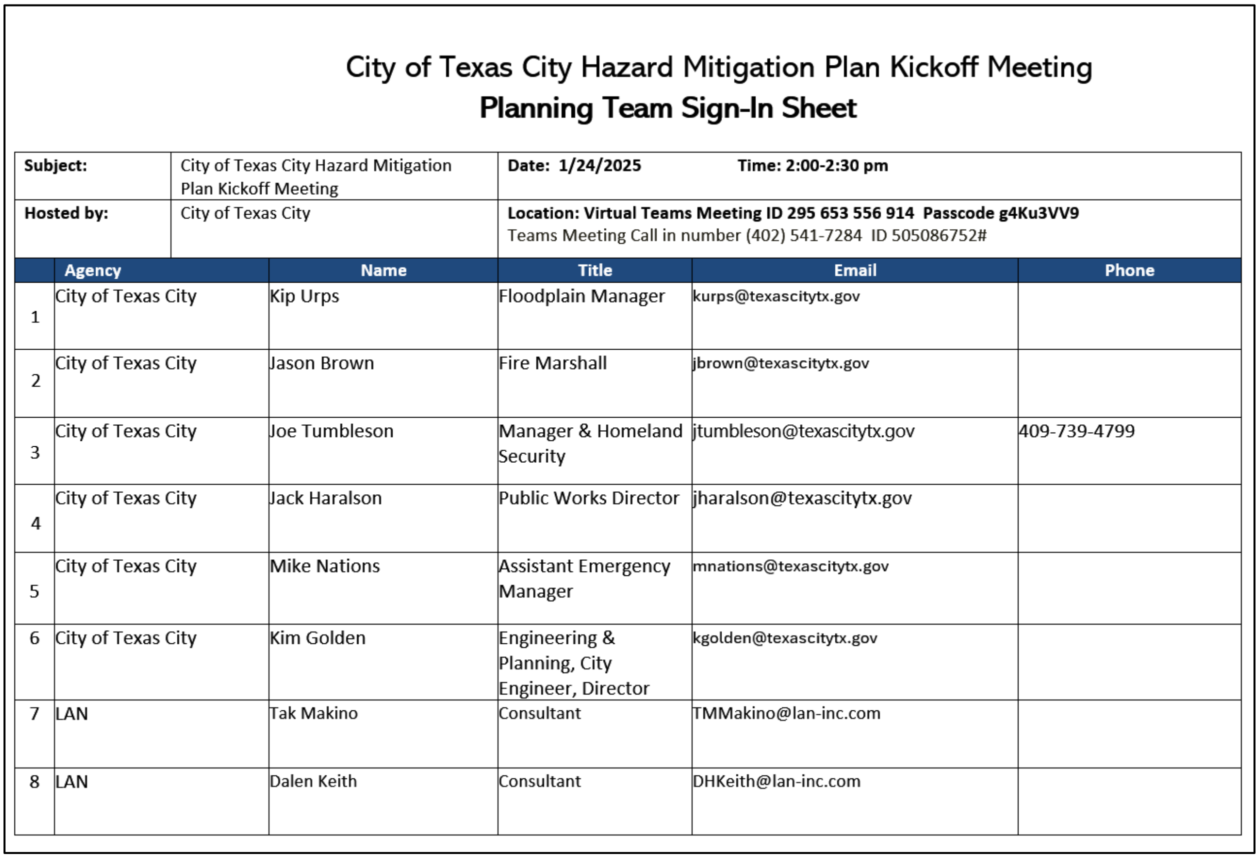
- → Public review and comment
- → Adopted by governing body
  - – Following TDEM, FEMA review
- → Planning Team to review mitigation strategy annually
- → Update plan every five years

15

Questions

16

Kickoff Planning Team Meeting Attendance, January 24, 2025



City of Texas City Hazard Mitigation Plan Kickoff Meeting

Planning Team Sign-In Sheet

Subject:	City of Texas City Hazard Mitigation Plan Kickoff Meeting	**Date: 1/24/2025**	**Time: 2:00-2:30 pm**
Hosted by:	City of Texas City	**Location: Virtual Teams Meeting ID 295 653 556 914 Passcode g4Ku3VV9** Teams Meeting Call in number (402) 541-7284 ID 505086752#	

	Agency	Name	Title	Email	Phone
1	City of Texas City	Kip Urps	Floodplain Manager	kurps@texascitytx.gov	
2	City of Texas City	Jason Brown	Fire Marshall	jbrown@texascitytx.gov	
3	City of Texas City	Joe Tumbleson	Manager & Homeland Security	jtumbleson@texascitytx.gov	409-739-4799
4	City of Texas City	Jack Haralson	Public Works Director	jharalson@texascitytx.gov	
5	City of Texas City	Mike Nations	Assistant Emergency Manager	mnations@texascitytx.gov	
6	City of Texas City	Kim Golden	Engineering & Planning, City Engineer, Director	kgolden@texascitytx.gov	
7	LAN	Tak Makino	Consultant	TMMakino@lan-inc.com	
8	LAN	Dalen Keith	Consultant	DHKeith@lan-inc.com	

Mitigation Strategy Public Meeting Presentation, March 6, 2025

City of Texas City Hazard Mitigation Plan

Mitigation Strategy – Public Meeting – March 6, 2025

1

Your presenter today:

Tak M. Makino, CFM
Flood Mitigation Manager
LAN

TMMakino@lan-inc.com

2

Here's our order of business

1 Purpose	2 Public Survey	3 Planning Process
4 Mitigation Strategy	5 Adoption/ Implementation Information	6 Questions

3

Purpose

- Prevent or reduce loss of life and property
- Improve resilience
- Identify cost-effective mitigation measures
- Build stakeholder/public partnerships
- Leverage FEMA funding
- Protect critical economic hub

4

FEMA Hazard Mitigation Assistance

5

Public Input
Survey Closed March 1, 2025

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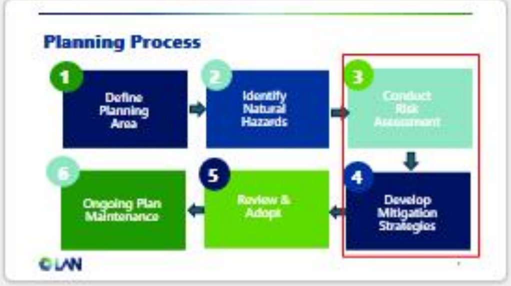


Planning Process

1. Define Planning Area
2. Identify Natural Hazards
3. Conduct Risk Assessment
4. Develop Mitigation Strategies
5. Review & Adopt
6. Ongoing Plan Maintenance

7

Planning Area

186.58 sq miles

8

Mitigation Strategy Public Meeting Presentation, March 6, 2025 (continued)

Risk Assessment

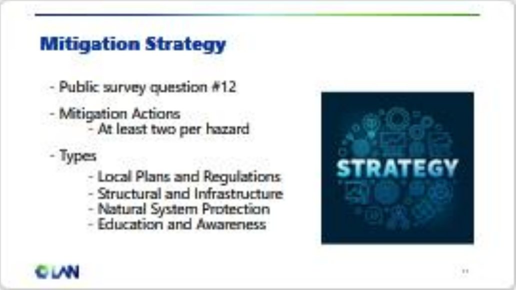
- Identify natural hazards
  - Previous occurrence
  - Probability of future occurrence
- Identify valuable assets
- Identify impacts to assets

9

Identify Natural Hazards

Wildfire
Windstorms
Extreme Winter Storms
Drought
Tornado
Expansive Soils
Land Subsidence
Hurricanes/ Tropical Storms
Lightning
Extreme Heat
Coastal Erosion
Floods
Dam/ Levee Failure
Hailstorms
~~Earthquake~~

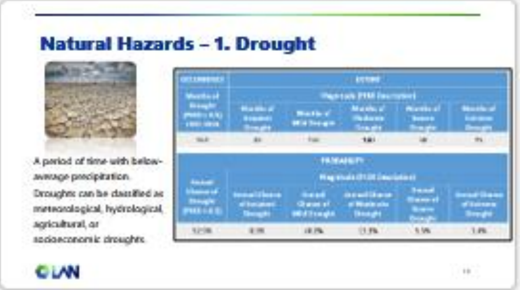
10



Mitigation Strategy

- Public survey question #12
- Mitigation Actions
  - At least two per hazard
- Types
  - Local Plans and Regulations
  - Structural and Infrastructure
  - Natural System Protection
  - Education and Awareness

11



Natural Hazards – 1. Drought

A period of time with below-average precipitation.

Droughts can be classified as meteorological, hydrological, agricultural, or socioeconomic droughts.

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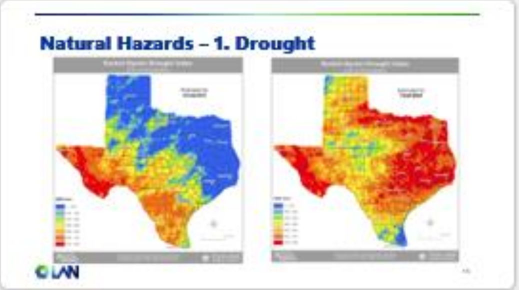

Natural Hazards – 1. Drought

13

Natural Hazards – 1. Drought

Mitigation Action Examples

- Developing new or upgrading existing water delivery systems to eliminate breaks and leaks.
- Developing a drought communication plan and early warning system to facilitate timely communication of relevant information to officials, decision makers, emergency managers, and the general public.
- Developing agreements for secondary water sources that may be used during drought conditions.
- Establishing a regular schedule to monitor and report conditions on at least a monthly basis.

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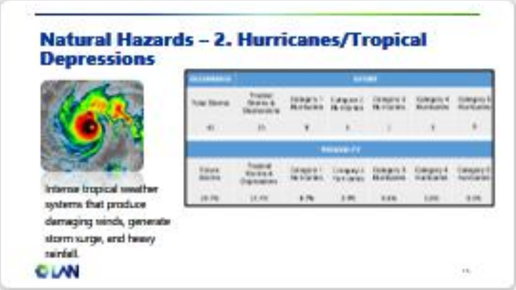

Natural Hazards – 2. Hurricanes/Tropical Depressions

Intense tropical weather systems that produce damaging winds, generate storm surge, and heavy rainfall.

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Natural Hazards – 2. Hurricane & Tropical Storm

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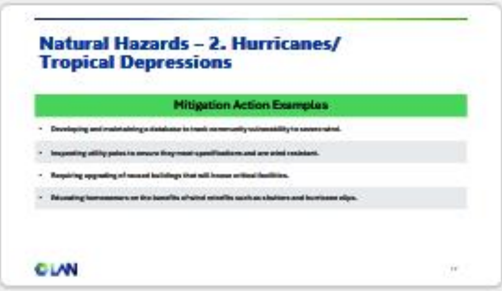
Mitigation Strategy Public Meeting Presentation, March 6, 2025 (continued)



Natural Hazards – 2. Hurricanes/ Tropical Depressions

Mitigation Action Examples

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Natural Hazards – 3. Floods

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Natural Hazards – 3. Floods

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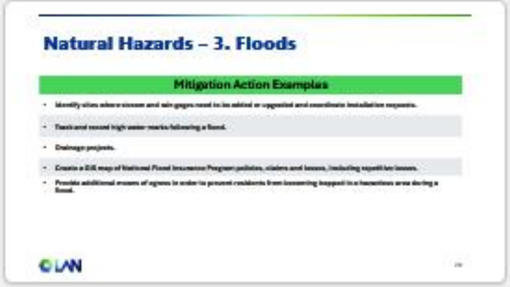

Natural Hazards – 3. Floods

Mitigation Action Examples

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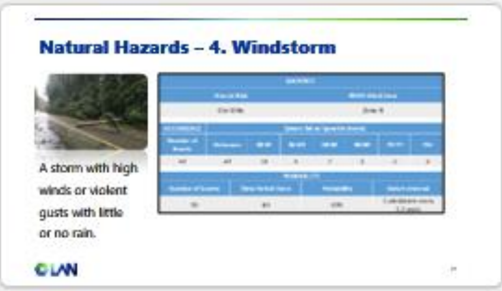

Natural Hazards – 4. Windstorm

A storm with high winds or violent gusts with little or no rain.

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Natural Hazards – 4. Windstorm

22

Natural Hazards – 4. Windstorm

Mitigation Action Examples

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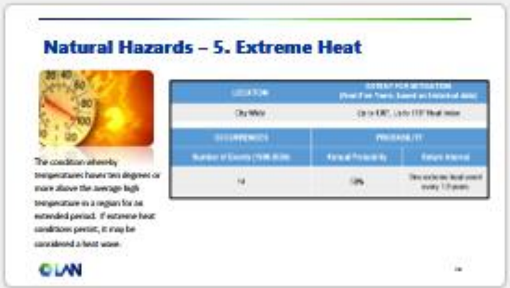

Natural Hazards – 5. Extreme Heat

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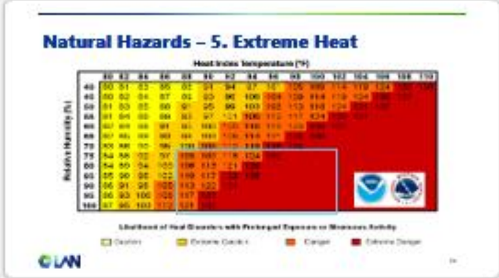
Mitigation Strategy Public Meeting Presentation, March 6, 2025 (continued)



Natural Hazards – 5. Extreme Heat

25

Natural Hazards – 5. Extreme Heat

Mitigation Action Examples

26

Natural Hazards – 6. Lightning

Lightning is a sudden electrostatic discharge during an electrical storm between electrically charged regions of a cloud, between that cloud and another cloud, or between a cloud and the ground.

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Natural Hazards – 6. Lightning

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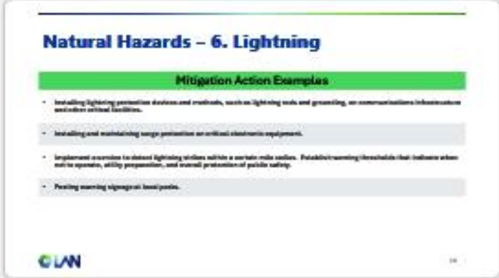


Natural Hazards – 6. Lightning

Mitigation Action Examples

29

Natural Hazards – 7. Tornado

A violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. Tornadoes have wind speeds of 250 miles per hour or more. Damage paths can be in excess of one-mile-wide and 50 miles long.

30

Natural Hazards – 7. Tornado

31

Natural Hazards – 7. Tornado

Mitigation Action Examples

32

Mitigation Strategy Public Meeting Presentation, March 6, 2025 (continued)

Natural Hazards – 8. Hailstorm

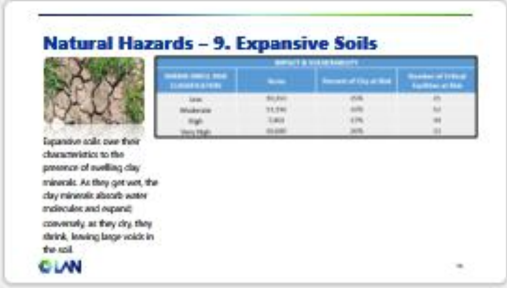
A form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice. Nearly all severe thunderstorms produce hail aloft, though it may melt before reaching the ground.

Natural Hazards – 8. Hailstorms

Natural Hazards – 8. Hailstorm

Mitigation Action Examples

- Locate tornado safe rooms inside or directly adjacent to houses to prevent hail induced injuries that may occur when taking shelter during a severe thunderstorm.
- Consider hail guards for HVAC equipment.
- Teaching school children about the dangers of hail and how to take safety precautions.
- Consider storing your fleet vehicles in multiple locations to spread risk and explore the possibility of protected coverings or indoor garaging.



Natural Hazards – 9. Expansive Soils

Expansive soils owe their characteristics to the presence of swelling clay minerals. As they get wet, the clay minerals absorb water molecules and expand; conversely, as they dry, they shrink, leaving large voids in the soil.

Natural Hazards – 9. Expansive Soils

Natural Hazards – 9. Expansive Soils

Mitigation Action Examples

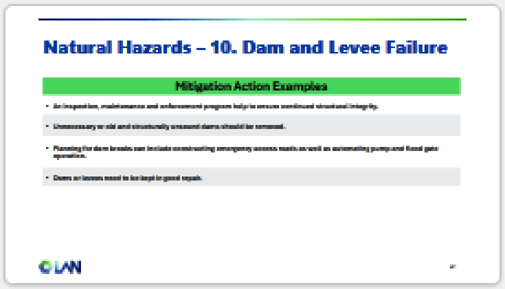
- Conduct pre-development inspection for potential expansive soil threats.
- Using steel reinforcing bars to post-tension a concrete slab on grade.
- Expansive substrates can be removed and replaced with non-expansive material.
- Reinforce slabs and footings. Smaller slabs can be strengthened with wire mesh in the concrete.

Natural Hazards – 10. Dam and Levee Failure

A systematic failure of a dam structure resulting in the uncontrolled release of water, often resulting in floods that could exceed the 100-year floodplain boundaries. A levee is an embankment built to prevent overflow from a body of water. A levee failure is when a levee embankment fails, or is intentionally breached, causing the previously contained water to flood the land behind the levee.

Natural Hazards – 10. Dam and Levee Failure

Mitigation Strategy Public Meeting Presentation, March 6, 2025 (continued)



Natural Hazards – 10. Dam and Levee Failure

Mitigation Action Examples

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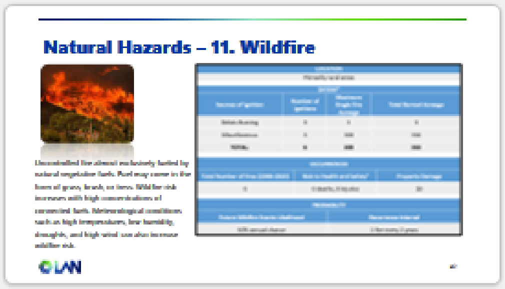

Natural Hazards – 11. Wildfire

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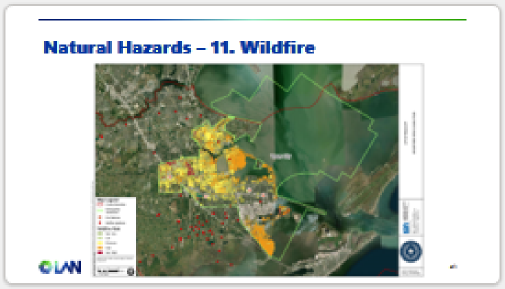

Natural Hazards – 11. Wildfire

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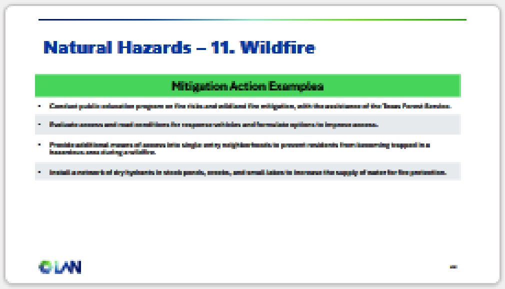

Natural Hazards – 11. Wildfire

Mitigation Action Examples

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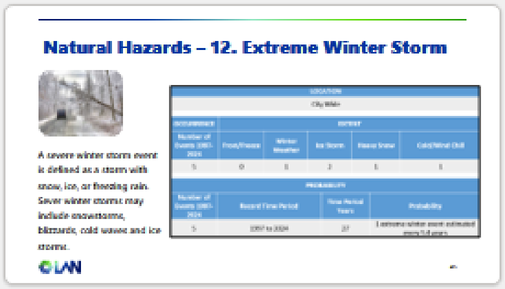

Natural Hazards – 12. Extreme Winter Storm

A severe winter storm event is defined as a storm with snow, ice, or freezing rain. Sever winter storms may include snowstorms, blizzards, cold waves and ice storms.

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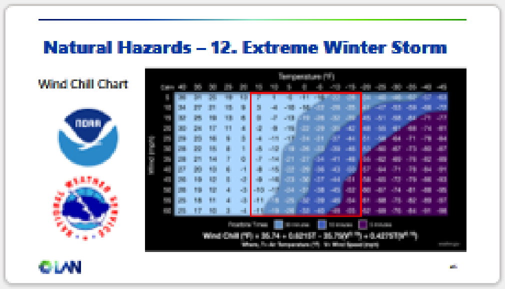
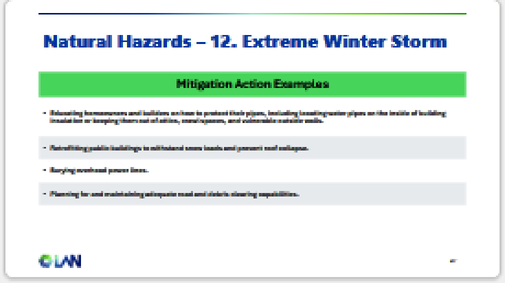


Natural Hazards – 12. Extreme Winter Storm

Wind Chill Chart

46



Natural Hazards – 12. Extreme Winter Storm

Mitigation Action Examples

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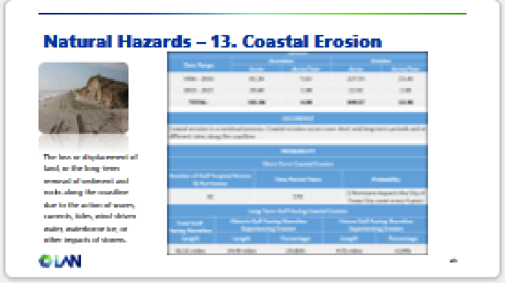
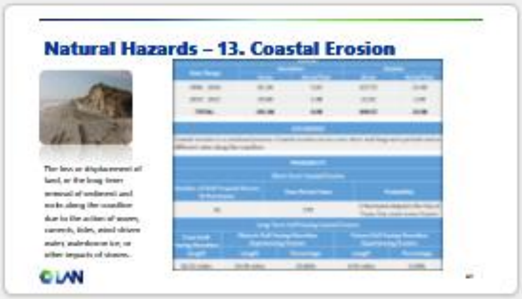


Natural Hazards – 13. Coastal Erosion

48

Mitigation Strategy Public Meeting Presentation, March 6, 2025 (continued)



Natural Hazards – 13. Coastal Erosion

49

Natural Hazards – 13. Coastal Erosion

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Natural Hazards – 13. Coastal Erosion

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Natural Hazards – 13. Coastal Erosion

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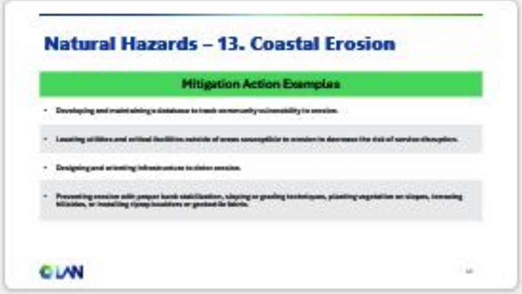

Natural Hazards – 13. Coastal Erosion

Mitigation Action Examples

- Developing and maintaining a database to track community vulnerability to erosion.
- Locating utilities and critical facilities outside of areas susceptible to erosion to decrease the risk of service disruption.
- Designing and orienting infrastructure to deter erosion.
- Preventing erosion with proper bank stabilization, sloping or grading techniques, planting vegetation on slopes, terracing hillsides, or installing riprap boulders or geotextile fabric.

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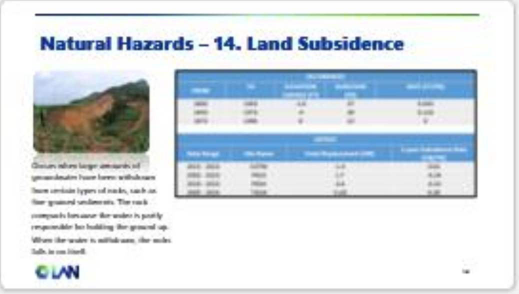

Natural Hazards – 14. Land Subsidence

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Natural Hazards – 14. Land Subsidence

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Natural Hazards – 14. Land Subsidence

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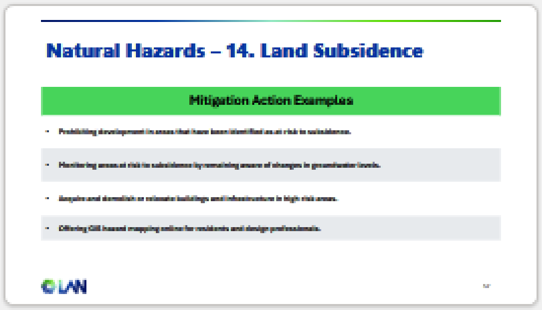
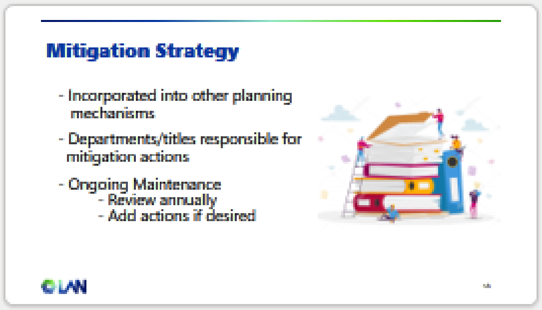
Mitigation Strategy Public Meeting Presentation, March 6, 2025 (continued)



Natural Hazards – 14. Land Subsidence

Mitigation Action Examples
Prohibiting development in areas that have been identified as at risk to subsidence.
Monitoring areas at risk to subsidence by remaining aware of changes in groundwater levels.
Acquire and demolish or relocate buildings and infrastructure in high-risk areas.
Offering GIS hazard mapping online for residents and design professionals.

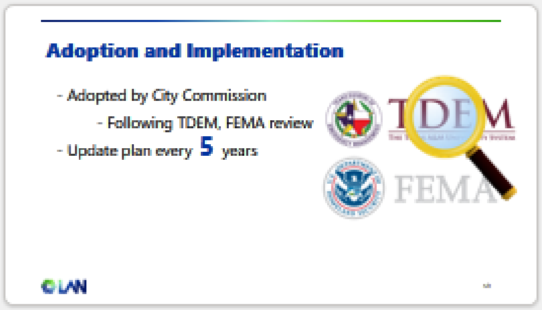
57



Mitigation Strategy

- Incorporated into other planning mechanisms
- Departments/titles responsible for mitigation actions
- Ongoing Maintenance
  - Review annually
  - Add actions if desired

58



Adoption and Implementation

- Adopted by City Commission
  - Following TDEM, FEMA review
- Update plan every **5** years

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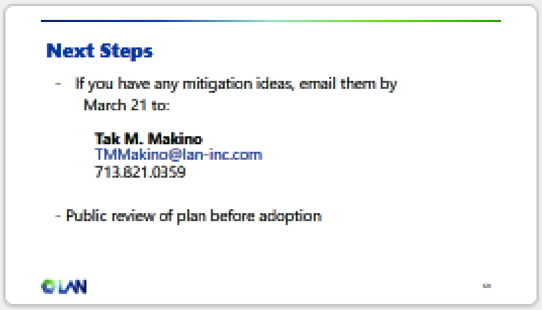


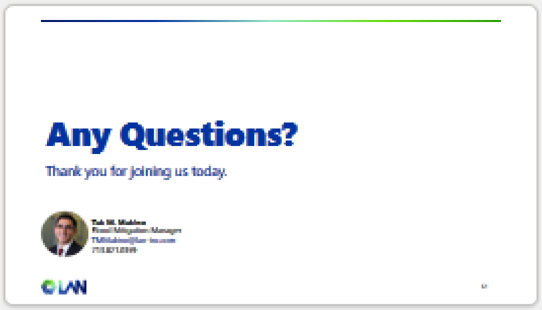
Next Steps

- If you have any mitigation ideas, email them by March 21 to:

Tak M. Makino
TMMakino@lan-inc.com
713.821.0359

- Public review of plan before adoption

60



Any Questions?

Thank you for joining us today.

Tak M. Makino
Flood Mitigation Manager
TMMakino@lan-inc.com
713.821.0359

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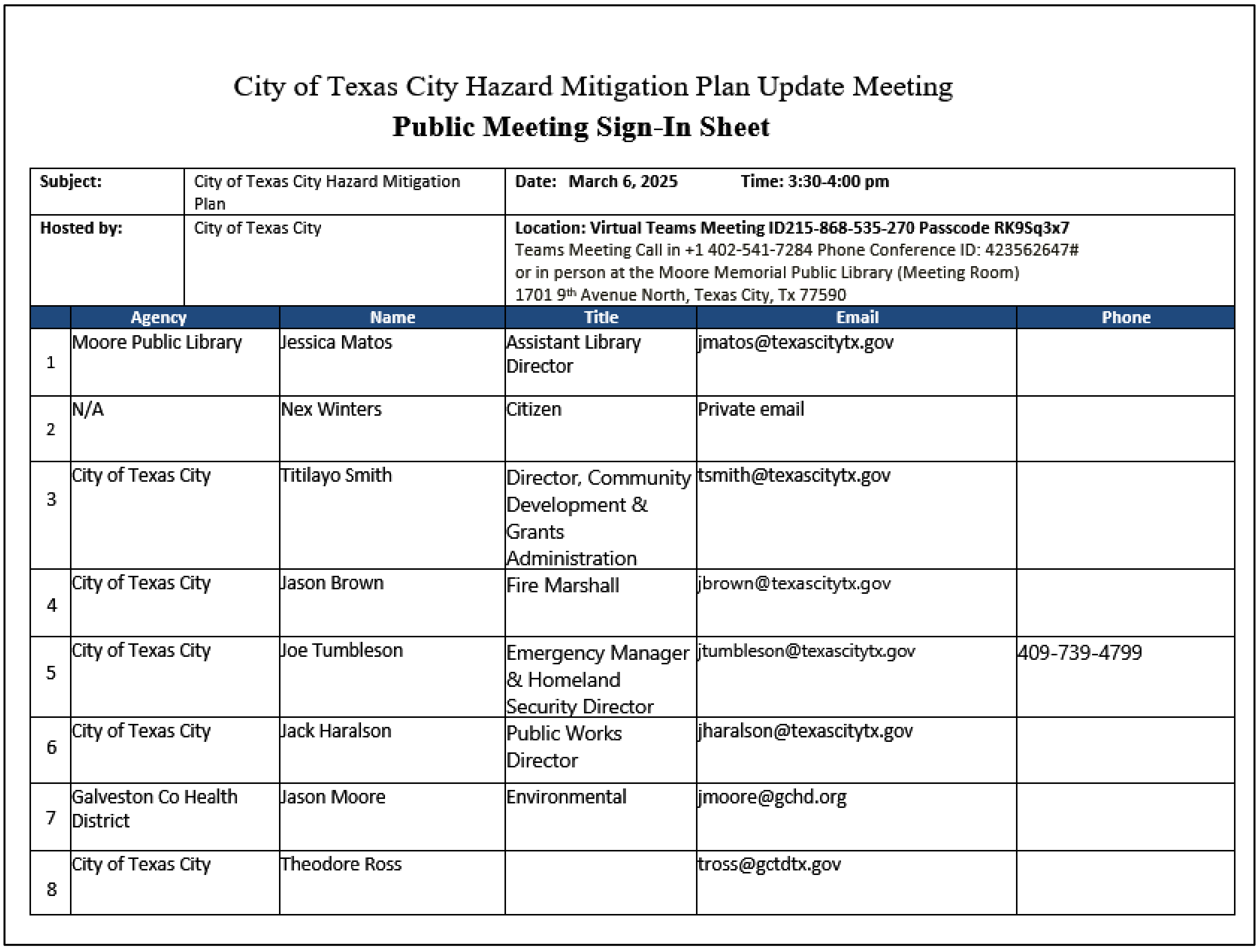
Mitigation Strategy Public Meeting Attendance, March 6, 2025



City of Texas City Hazard Mitigation Plan Update Meeting

Public Meeting Sign-In Sheet

Subject:	City of Texas City Hazard Mitigation Plan	**Date: March 6, 2025** **Time: 3:30-4:00 pm**
Hosted by:	City of Texas City	**Location: Virtual Teams Meeting ID215-868-535-270 Passcode RK9Sq3x7** Teams Meeting Call in +1 402-541-7284 Phone Conference ID: 423562647# or in person at the Moore Memorial Public Library (Meeting Room) 1701 9th Avenue North, Texas City, Tx 77590

	Agency	Name	Title	Email	Phone
1	Moore Public Library	Jessica Matos	Assistant Library Director	jmatos@texascitytx.gov	
2	N/A	Nex Winters	Citizen	Private email	
3	City of Texas City	Titilayo Smith	Director, Community Development & Grants Administration	tsmith@texascitytx.gov	
4	City of Texas City	Jason Brown	Fire Marshall	jbrown@texascitytx.gov	
5	City of Texas City	Joe Tumbleson	Emergency Manager & Homeland Security Director	jtumbleson@texascitytx.gov	409-739-4799
6	City of Texas City	Jack Haralson	Public Works Director	jharalson@texascitytx.gov	
7	Galveston Co Health District	Jason Moore	Environmental	jmoore@gchd.org	
8	City of Texas City	Theodore Ross		tross@gctdtx.gov	

9	Texas City Housing Authority	Benjamin Davis	Executive Director	bdavis@tchousing.net	
10	Galveston County Food Bank	Julie Morreale	Development Director	julie@galvestoncountyfoodbank.org	
11	City of Texas City	Kip Urps	Floodplain Manager	kurps@texascitytx.gov	
12	LAN	Tak Makino	Consultant	TMMakino@lan-inc.com	
13	LAN	Dalen Keith	Consultant	DHKeith@lan-inc.com	
14	LAN	Gage Garza	Consultant	GNGarza@lan-inc.com	

Mitigation Strategy Planning Team Meeting Presentation, March 6, 2025

City of Texas City
Hazard Mitigation Plan

Mitigation Strategy – Planning Team Meeting – March 6, 2025

1

Your presenter today:

Tak M. Makino, CFM
Flood Mitigation Manager
LAN

TMMakino@lan-inc.com
713.821.0359

2

Here's our order of business

1 Purpose
2 Public Survey
3 Planning Process
4 Mitigation Strategy
5 Adoption/ Implementation Information
6 Questions

3

Purpose

- Prevent or reduce loss of life and property
- Improve resilience
- Identify cost-effective mitigation measures
- Build stakeholder/public partnerships
- Leverage FEMA funding
- Protect critical economic hub

4

FEMA Hazard Mitigation Assistance

5

FEMA Hazard Mitigation Assistance

- Hazard Mitigation Grant Program (HMGP)
  - Disaster Based
  - 75/25 cost share
- Building Resilient Infrastructure & Communities (BRIC)
  - Annual
  - 75/25 cost share
- Flood Mitigation Assistance
  - Annual
  - 75/25 cost share
  - Insured Structures

6

Public Input

Survey Closed March 1, 2025

LOCAL HAZARD MITIGATION PLAN

141+ surveys received

7

Planning Team

- Key Participating Jurisdiction Staff
- Major Stakeholders
- Agencies involved in hazard mitigation
- Agencies with authority to regulate development
- Neighboring communities

8

Mitigation Strategy Planning Team Meeting Presentation, March 6, 2025 (continued)

Planning Team Responsibilities

1 Participation in planning process

2 Provide historical data

3 Provide GIS data

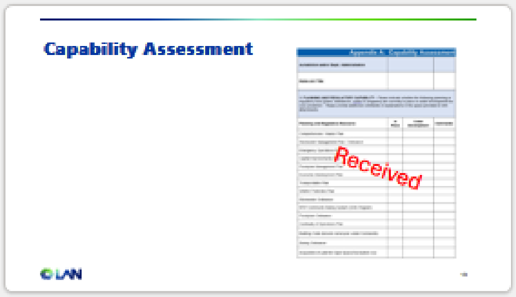
4 Promote public engagement

5 Develop mitigation actions

6 Review draft plan and adopt final plan

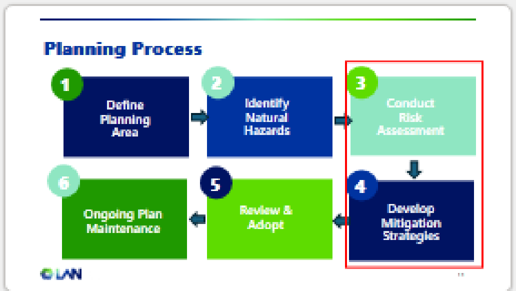
7 Ongoing plan maintenance

9



Capability Assessment

10



Planning Process

1 Define Planning Area

2 Identify Natural Hazards

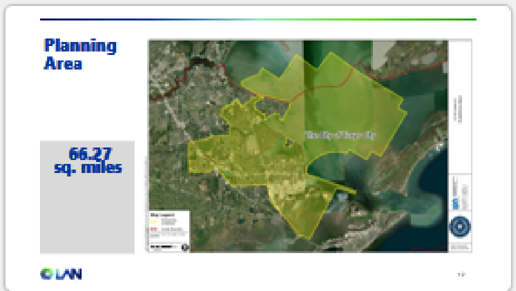
3 Conduct Risk Assessment

4 Develop Mitigation Strategies

5 Review & Adopt

6 Ongoing Plan Maintenance

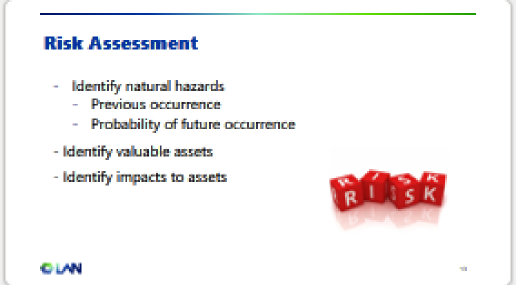
11



Planning Area

66.27 sq. miles

12



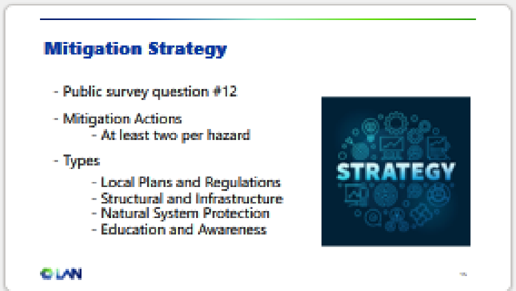
Risk Assessment

- Identify natural hazards
  - Previous occurrence
  - Probability of future occurrence
- Identify valuable assets
- Identify impacts to assets

13

Identify Natural Hazards (15)

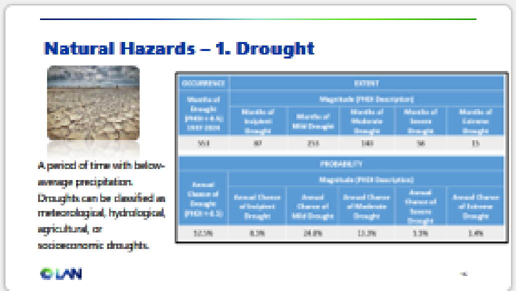
14



Mitigation Strategy

- Public survey question #12
- Mitigation Actions
  - At least two per hazard
- Types
  - Local Plans and Regulations
  - Structural and Infrastructure
  - Natural System Protection
  - Education and Awareness

15



Natural Hazards – 1. Drought

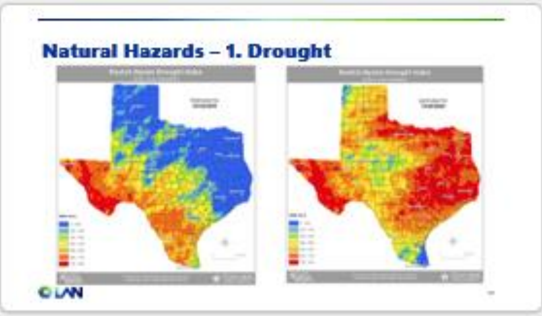
A period of time with below-average precipitation. Droughts can be classified as meteorological, hydrological, agricultural, or socioeconomic droughts.

OCCURRENCE	EXTENT				
[illegible]	Magnitude (PHDI Description)				
	Months of Incipient Drought	Months of Mild Drought	Months of Moderate Drought	Months of Severe Drought	Months of Extreme Drought
553	87	253	140	58	15

PROBABILITY					
[illegible]	Magnitude (PHDI Description)				
	Annual Chance of Incipient Drought	Annual Chance of Mild Drought	Annual Chance of Moderate Drought	Annual Chance of Severe Drought	Annual Chance of Extreme Drought
12.5%	6.3%	24.8%	13.3%	3.3%	1.4%

16

Mitigation Strategy Planning Team Meeting Presentation, March 6, 2025 (continued)



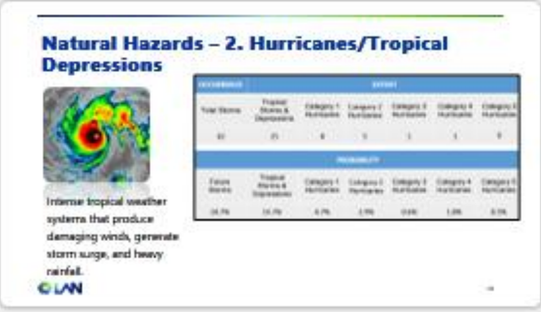
Natural Hazards – 1. Drought

17

Natural Hazards – 1. Drought

Mitigation Action Examples

18



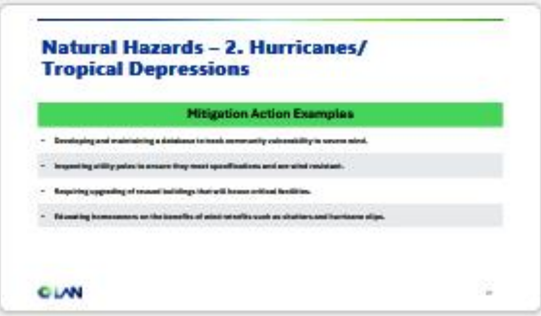
Natural Hazards – 2. Hurricanes/Tropical Depressions

Intense tropical weather systems that produce damaging winds, generate storm surge, and heavy rainfall.

19

Natural Hazards – 2. Hurricane & Tropical Storm

20



Natural Hazards – 2. Hurricanes/ Tropical Depressions

Mitigation Action Examples

21

Natural Hazards – 3. Floods

22

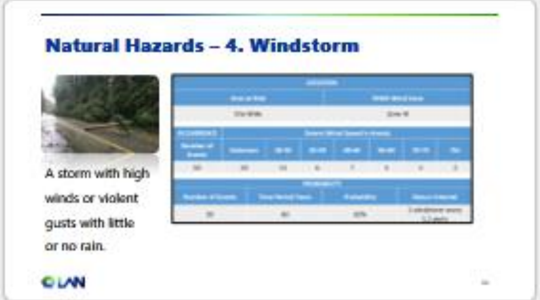
Natural Hazards – 3. Floods

23

Natural Hazards – 3. Floods

Mitigation Action Examples

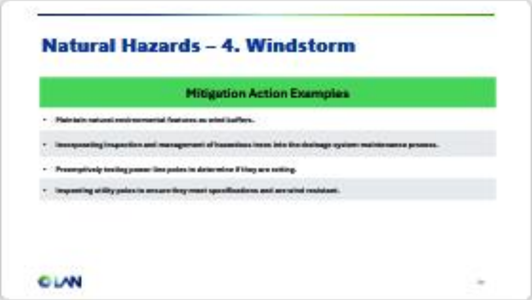
24



Natural Hazards – 4. Windstorm

A storm with high winds or violent gusts with little or no rain.

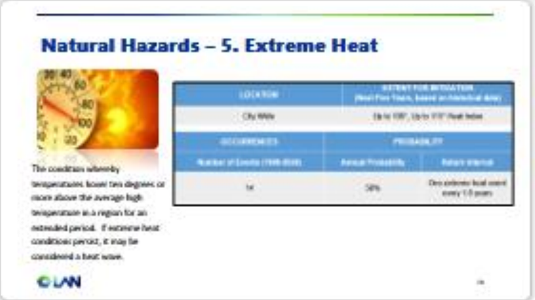
Natural Hazards – 4. Windstorm



Natural Hazards – 4. Windstorm

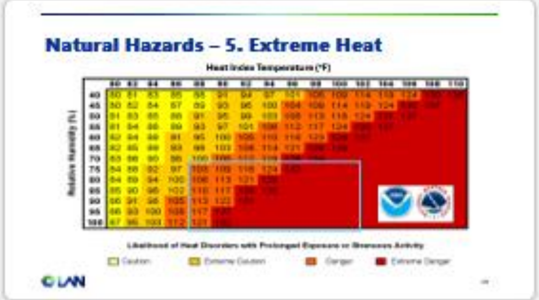
Mitigation Action Examples

- Maintain natural environmental features as wind buffers.
- Incorporating inspection and management of hazardous trees into the drainage system maintenance process.
- Preemptively testing power line poles to determine if they are rotting.
- Inspecting utility poles to ensure they meet specifications and are wind resistant.



Natural Hazards – 5. Extreme Heat

The condition whereby temperatures hover ten degrees or more above the average high temperature in a region for an extended period. If extreme heat conditions persist, it may be considered a heat wave.

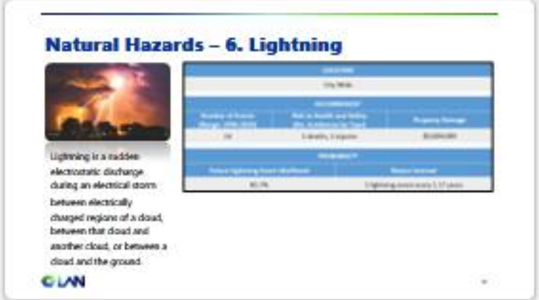


Natural Hazards – 5. Extreme Heat

Natural Hazards – 5. Extreme Heat

Mitigation Action Examples

- Increasing tree plantings around buildings to shade parking lots and along public rights of way.
- Educating citizens regarding the dangers of extreme heat and the steps they can take to protect themselves when extreme temperatures occur.
- Using cool roofing products that reflect sunlight and heat away from a building.
- Encouraging installation of green roofs, which provide shade and remove heat from the roof surface and surrounding air.

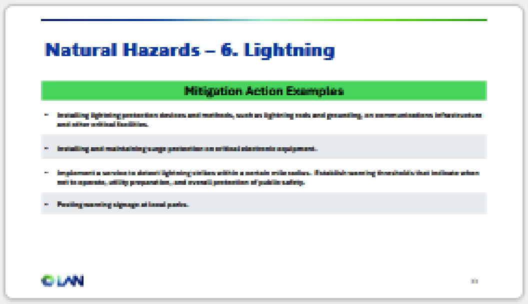


Natural Hazards – 6. Lightning

Lightning is a sudden electrostatic discharge during an electrical storm between electrically charged regions of a cloud, between that cloud and another cloud, or between a cloud and the ground.

Natural Hazards – 6. Lightning

Mitigation Strategy Planning Team Meeting Presentation, March 6, 2025 (continued)



Natural Hazards – 6. Lightning

Mitigation Action Examples

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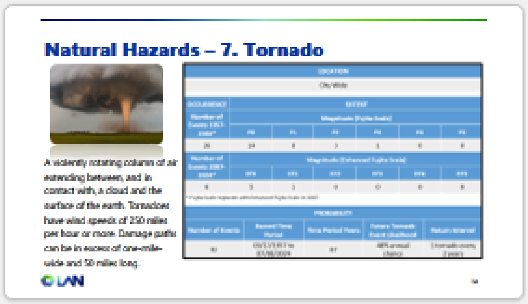
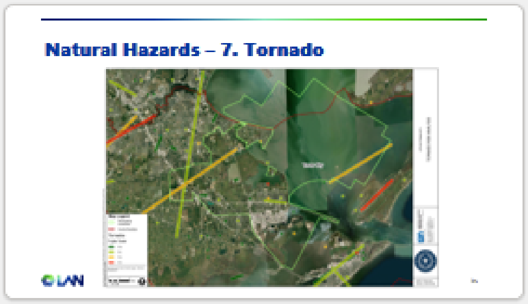


Natural Hazards – 7. Tornado

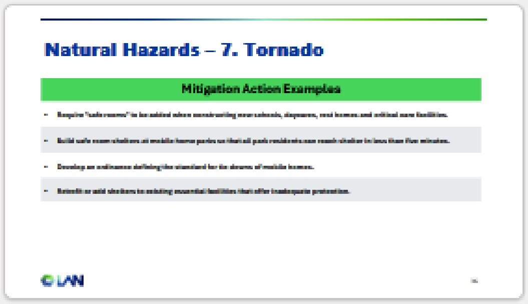
A violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. Tornadoes have wind speeds of 250 miles per hour or more. Damage paths can be in excess of one-mile-wide and 50 miles long.

34



Natural Hazards – 7. Tornado

35



Natural Hazards – 7. Tornado

Mitigation Action Examples

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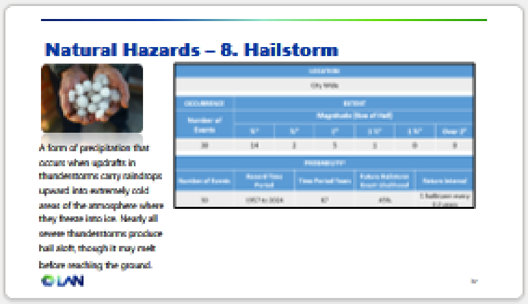
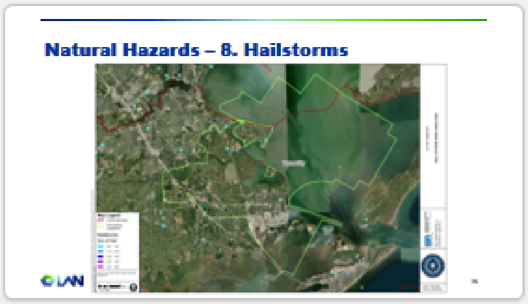


Natural Hazards – 8. Hailstorm

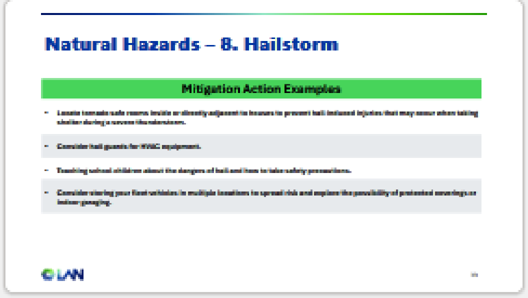
A form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice. Nearly all severe thunderstorms produce hail aloft, though it may melt before reaching the ground.

37



Natural Hazards – 8. Hailstorms

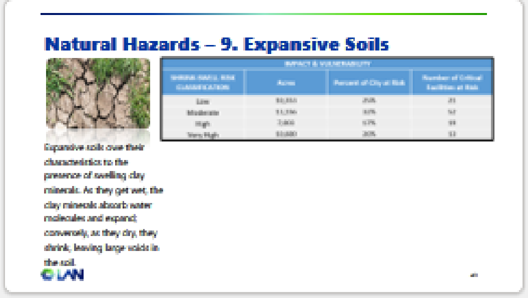
38



Natural Hazards – 8. Hailstorm

Mitigation Action Examples

39



Natural Hazards – 9. Expansive Soils

Expansive soils owe their characteristics to the presence of swelling clay minerals. As they get wet, the clay minerals absorb water molecules and expand; conversely, as they dry, they shrink, leaving large voids in the soil.

40

Mitigation Strategy Planning Team Meeting Presentation, March 6, 2025 (continued)

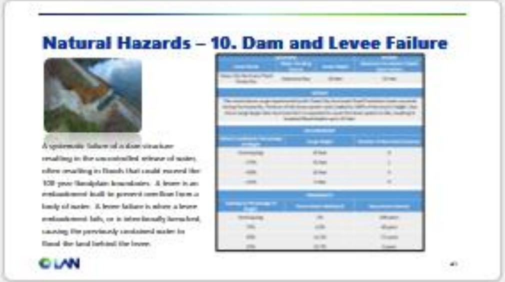
Natural Hazards – 9. Expansive Soils

41

Natural Hazards – 9. Expansive Soils

Mitigation Action Examples

42

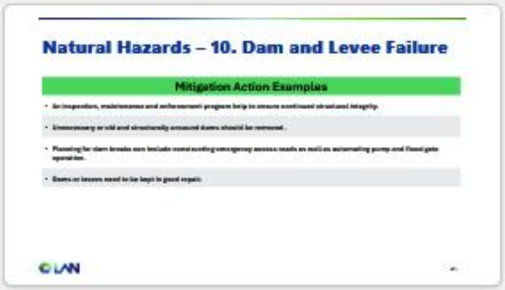


Natural Hazards – 10. Dam and Levee Failure

43

Natural Hazards – 10. Dam and Levee Failure

44



Natural Hazards – 10. Dam and Levee Failure

Mitigation Action Examples

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Natural Hazards – 11. Wildfire

46

Natural Hazards – 11. Wildfire

47

Natural Hazards – 11. Wildfire

Mitigation Action Examples

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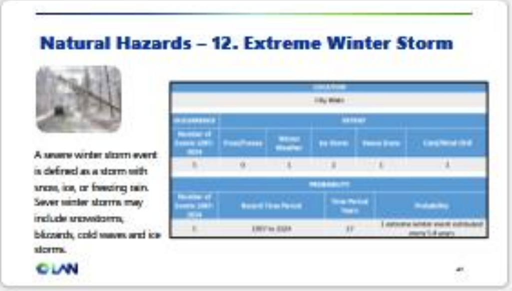
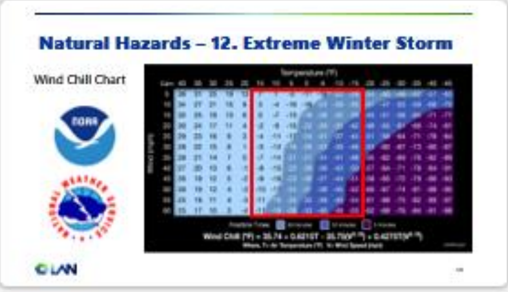
Mitigation Strategy Planning Team Meeting Presentation, March 6, 2025 (continued)



Natural Hazards – 12. Extreme Winter Storm

A severe winter storm event is defined as a storm with snow, ice, or freezing rain. Sever winter storms may include snowstorms, blizzards, cold waves and ice storms.

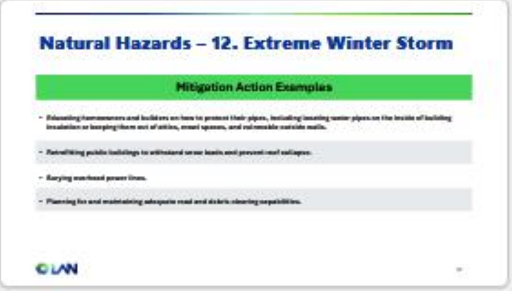
49



Natural Hazards – 12. Extreme Winter Storm

Wind Chill Chart

50

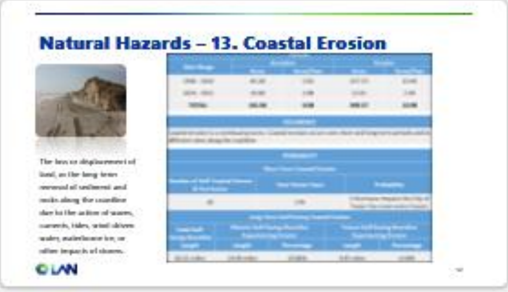


Natural Hazards – 12. Extreme Winter Storm

Mitigation Action Examples

- Educating homeowners and builders on how to protect their pipes, including locating water pipes on the inside of building insulation or keeping them out of attics, crawl spaces, and vulnerable outside walls.
- Retrofitting public buildings to withstand snow loads and prevent roof collapse.
- Burying overhead power lines.
- Planning for and maintaining adequate road and debris clearing capabilities.

51



Natural Hazards – 13. Coastal Erosion

The loss or displacement of land, or the long-term removal of sediment and rocks along the coastline due to the action of waves, currents, tides, wind-driven water, waterborne ice, or other impacts of storms.

52

Natural Hazards – 13. Coastal Erosion

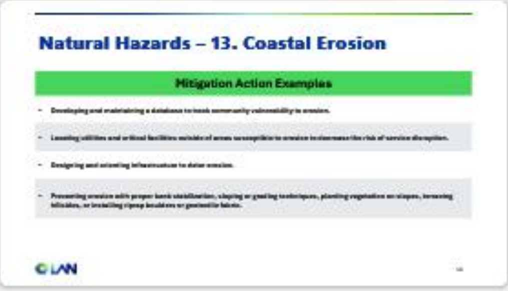
53

Natural Hazards – 13. Coastal Erosion

54

Natural Hazards – 13. Coastal Erosion

55



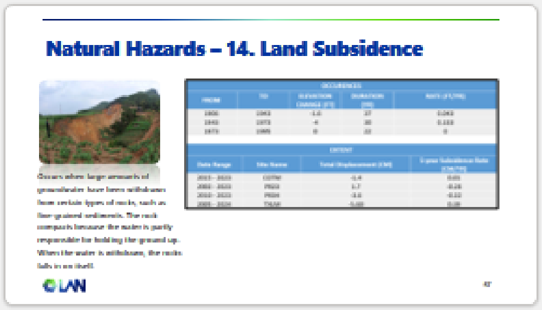
Natural Hazards – 13. Coastal Erosion

Mitigation Action Examples

- Developing and maintaining a database to track community vulnerability to erosion.
- Locating utilities and critical facilities outside of areas susceptible to erosion to decrease the risk of service disruption.
- Designing and orienting infrastructure to deter erosion.
- Preventing erosion with proper bank stabilization, sloping or grading techniques, planting vegetation on slopes, terracing hillsides, or installing riprap boulders or geotextile fabric.

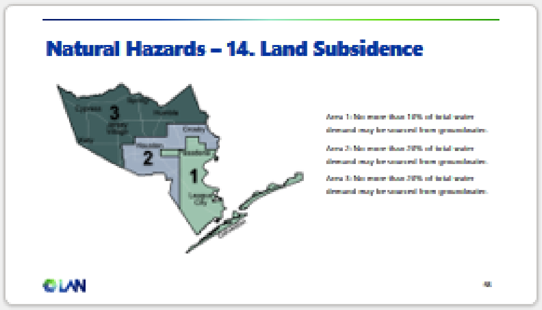
56

Mitigation Strategy Planning Team Meeting Presentation, March 6, 2025 (continued)



Natural Hazards – 14. Land Subsidence

Occurs when large amounts of groundwater have been withdrawn from certain types of rocks, such as fine-grained sediments. The rock compacts because the water is partly responsible for holding the ground up. When the water is withdrawn, the rocks falls in on itself.

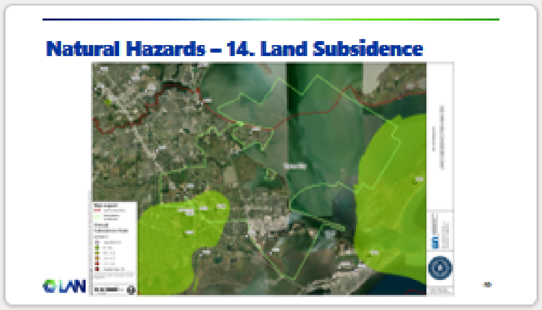


Natural Hazards – 14. Land Subsidence

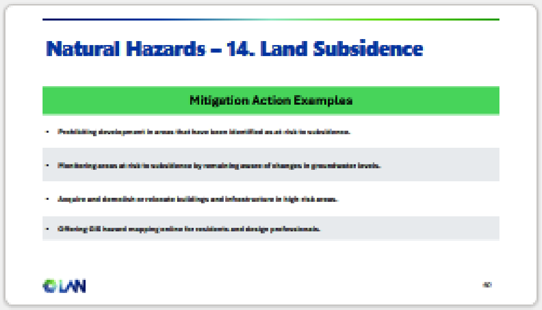
Area 1: No more than 10% of total water demand may be sourced from groundwater.

Area 2: No more than 20% of total water demand may be sourced from groundwater.

Area 3: No more than 20% of total water demand may be sourced from groundwater.



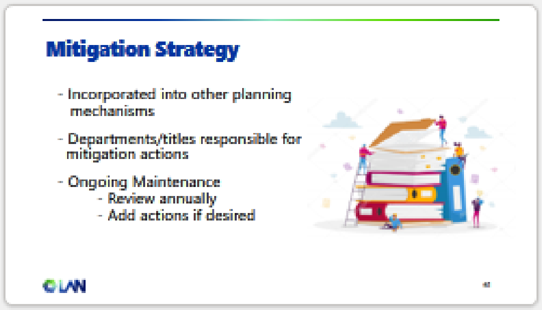
Natural Hazards – 14. Land Subsidence



Natural Hazards – 14. Land Subsidence

Mitigation Action Examples

- Prohibiting development in areas that have been identified as at risk to subsidence.
- Monitoring areas at risk to subsidence by remaining aware of changes in groundwater levels.
- Acquire and demolish or relocate buildings and infrastructure in high risk areas.
- Offering GIS hazard mapping online for residents and design professionals.

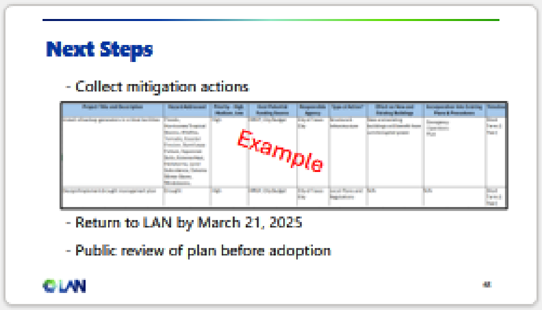


Mitigation Strategy

- Incorporated into other planning mechanisms
- Departments/titles responsible for mitigation actions
- Ongoing Maintenance
  - Review annually
  - Add actions if desired

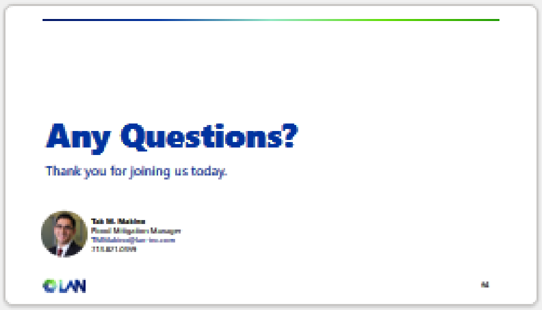
Adoption and Implementation

- Adopted by City Commission
  - Following TDEM, FEMA review
- Planning Team to review mitigation strategy annually
- Update plan every 5 years



Next Steps

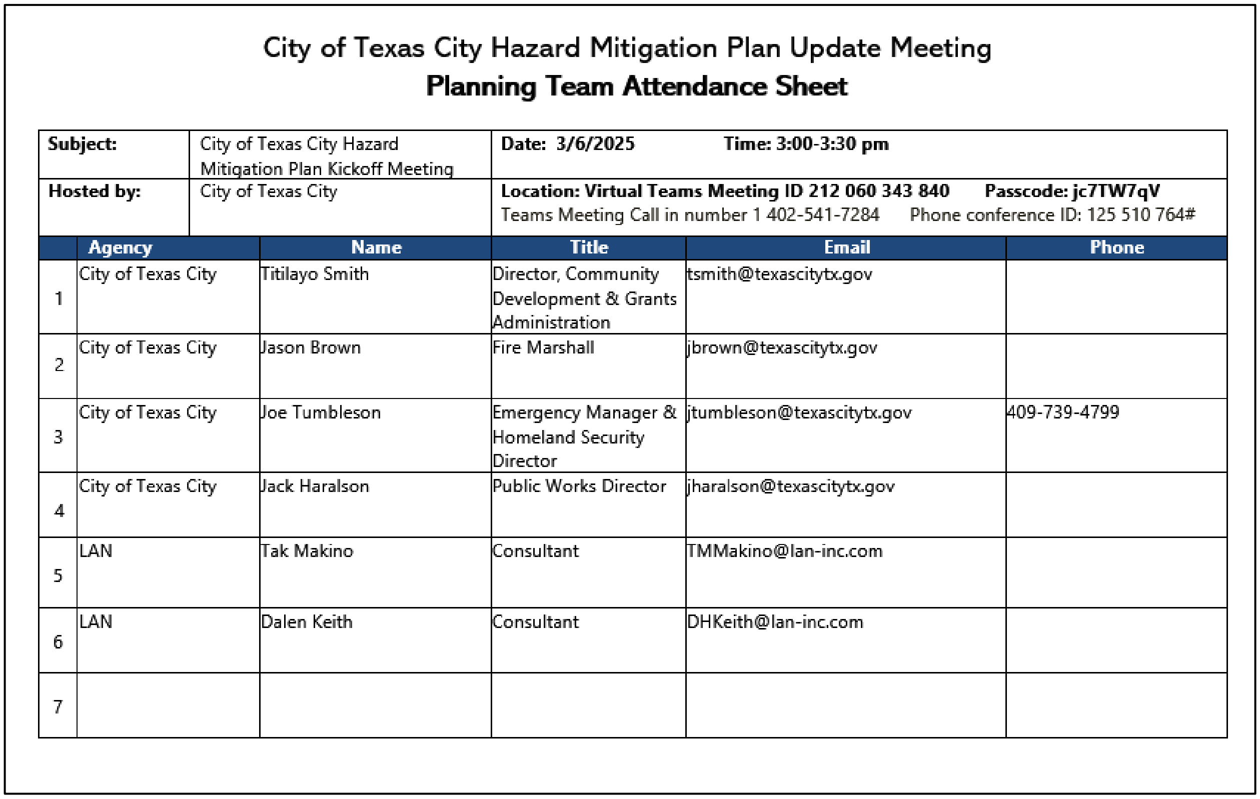
- Collect mitigation actions
- Return to LAN by March 21, 2025
- Public review of plan before adoption



Any Questions?

Thank you for joining us today.

Mitigation Strategy Planning Team Attendance, March 6, 2025



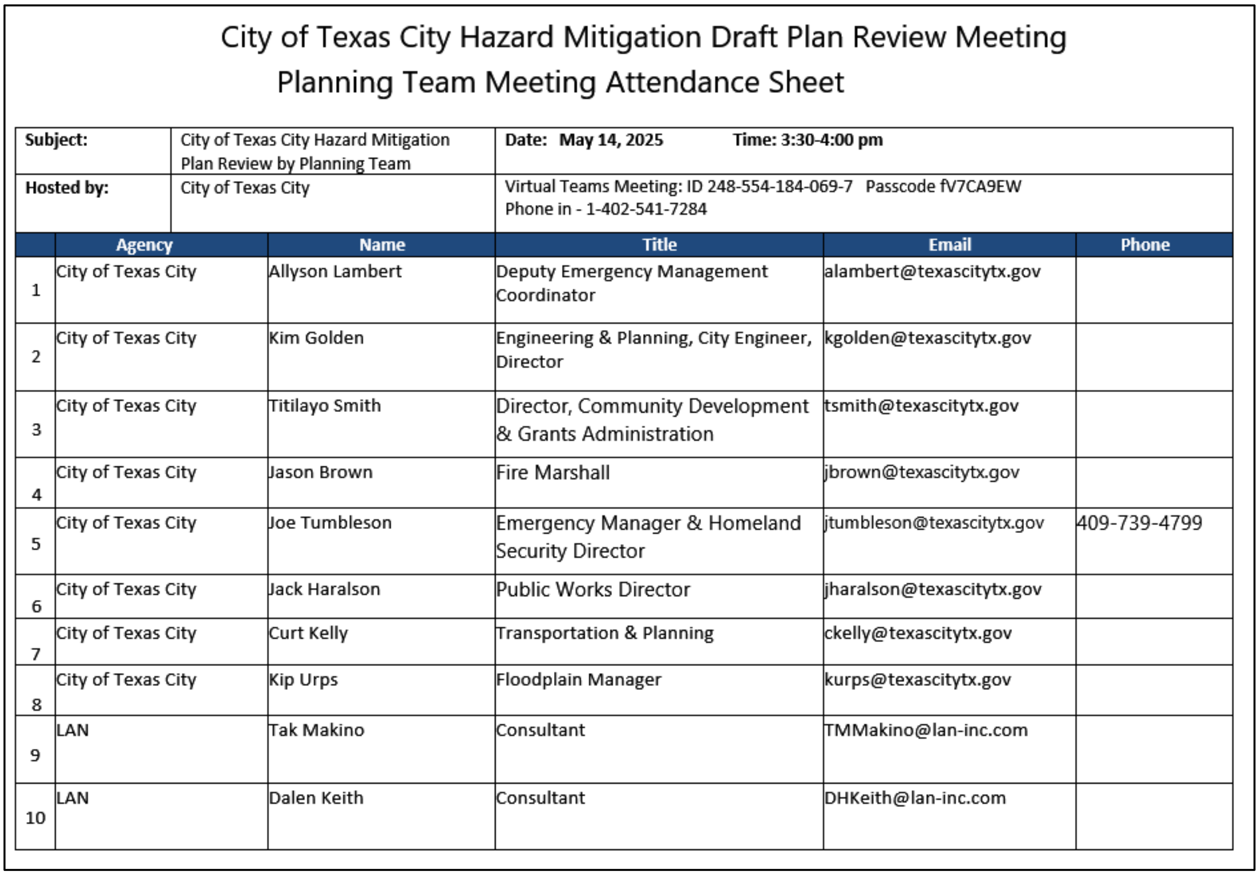
City of Texas City Hazard Mitigation Plan Update Meeting

Planning Team Attendance Sheet

Subject:	City of Texas City Hazard Mitigation Plan Kickoff Meeting	**Date: 3/6/2025**	**Time: 3:00-3:30 pm**
Hosted by:	City of Texas City	**Location: Virtual Teams Meeting ID 212 060 343 840** Teams Meeting Call in number 1 402-541-7284	**Passcode: jc7TW7qV** Phone conference ID: 125 510 764#

	Agency	Name	Title	Email	Phone
1	City of Texas City	Titilayo Smith	Director, Community Development & Grants Administration	tsmith@texascitytx.gov	
2	City of Texas City	Jason Brown	Fire Marshall	jbrown@texascitytx.gov	
3	City of Texas City	Joe Tumbleson	Emergency Manager & Homeland Security Director	jtumbleson@texascitytx.gov	409-739-4799
4	City of Texas City	Jack Haralson	Public Works Director	jharalson@texascitytx.gov	
5	LAN	Tak Makino	Consultant	TMMakino@lan-inc.com	
6	LAN	Dalen Keith	Consultant	DHKeith@lan-inc.com	
7					

Hazard Mitigation Plan Draft Review, May 14, 2025, with Planning Team



City of Texas City Hazard Mitigation Draft Plan Review Meeting

Planning Team Meeting Attendance Sheet

Subject:	City of Texas City Hazard Mitigation Plan Review by Planning Team	**Date: May 14, 2025** **Time: 3:30-4:00 pm**
Hosted by:	City of Texas City	Virtual Teams Meeting: ID 248-554-184-069-7 Passcode fV7CA9EW Phone in - 1-402-541-7284

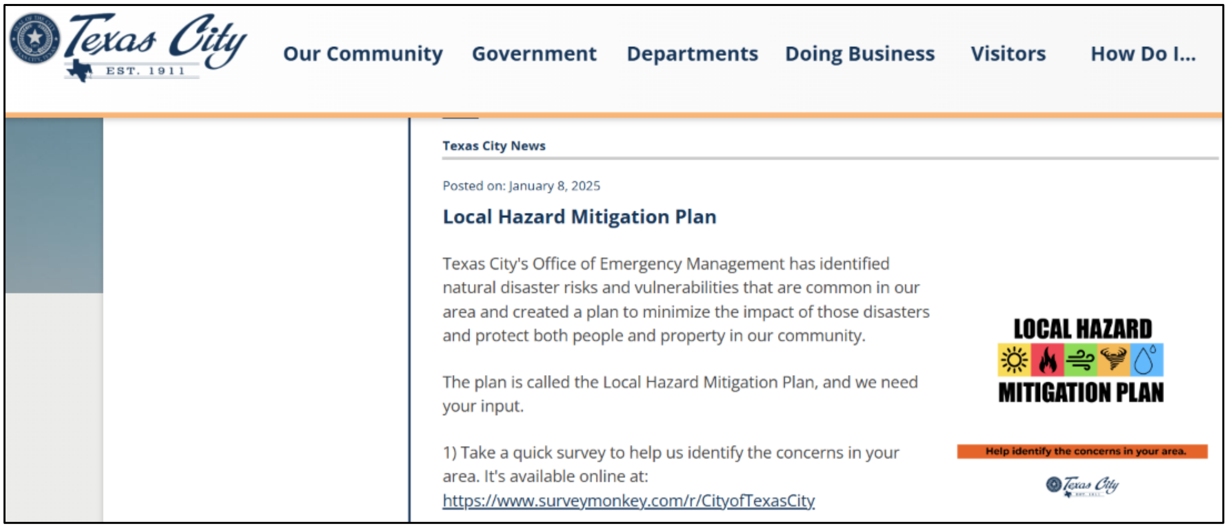
	Agency	Name	Title	Email	Phone
1	City of Texas City	Allyson Lambert	Deputy Emergency Management Coordinator	alambert@texascitytx.gov	
2	City of Texas City	Kim Golden	Engineering & Planning, City Engineer, Director	kgolden@texascitytx.gov	
3	City of Texas City	Titilayo Smith	Director, Community Development & Grants Administration	tsmith@texascitytx.gov	
4	City of Texas City	Jason Brown	Fire Marshall	jbrown@texascitytx.gov	
5	City of Texas City	Joe Tumbleson	Emergency Manager & Homeland Security Director	jtumbleson@texascitytx.gov	409-739-4799
6	City of Texas City	Jack Haralson	Public Works Director	jharalson@texascitytx.gov	
7	City of Texas City	Curt Kelly	Transportation & Planning	ckelly@texascitytx.gov	
8	City of Texas City	Kip Urps	Floodplain Manager	kurps@texascitytx.gov	
9	LAN	Tak Makino	Consultant	TMMakino@lan-inc.com	
10	LAN	Dalen Keith	Consultant	DHKeith@lan-inc.com	

Appendix B: Public Survey

Overview

The City of Texas City prepared a survey with questions for the public concerning their opinions regarding natural hazards. The link to the survey was made available on the City of Texas City website at https://www.surveymonkey.com/r/TexasCityHMP. Survey results are depicted on the following pages, showing the percentage of responses for each answer. For questions that did not provide a multiple-choice answer, or that required an explanation, comments are summarized where similar.

Figure B-1: Screen Shot of Public Survey Link on City of Texas City Website



Texas City News

Posted on: January 8, 2025

Local Hazard Mitigation Plan

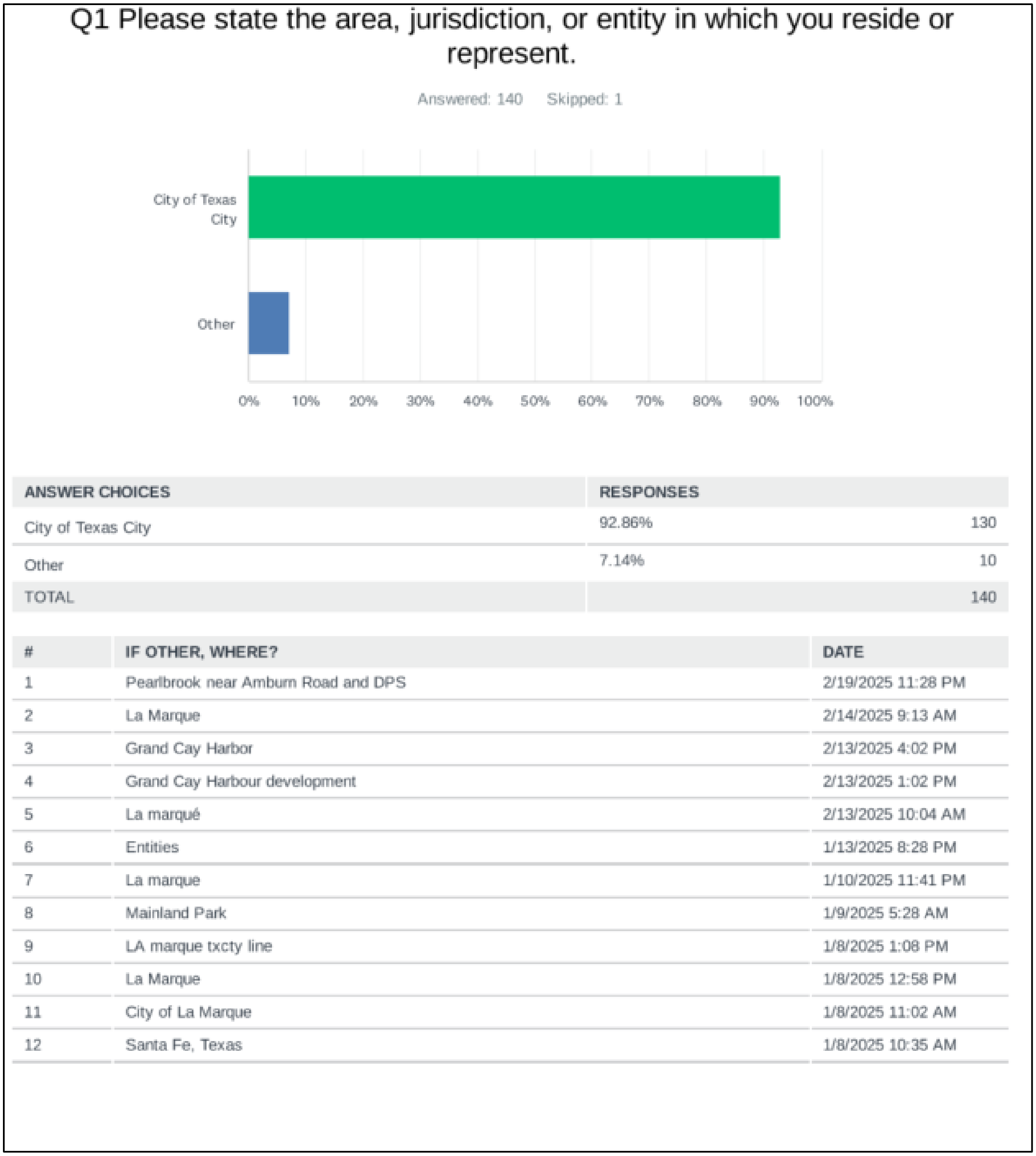
Texas City's Office of Emergency Management has identified natural disaster risks and vulnerabilities that are common in our area and created a plan to minimize the impact of those disasters and protect both people and property in our community.

The plan is called the Local Hazard Mitigation Plan, and we need your input.

1) Take a quick survey to help us identify the concerns in your area. It's available online at: https://www.surveymonkey.com/r/CityofTexasCity

Public Survey Questions & Results

Question #1:



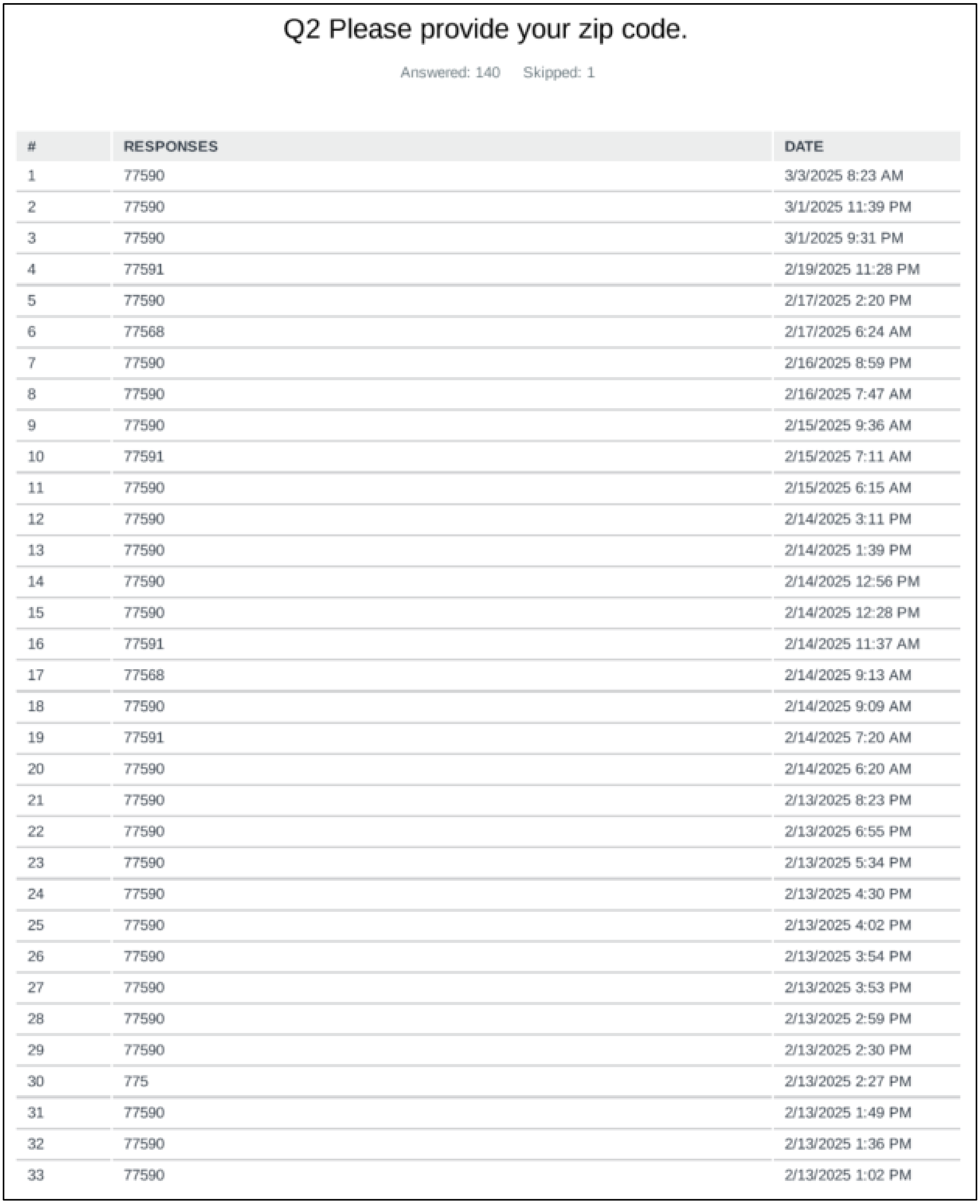
Q1 Please state the area, jurisdiction, or entity in which you reside or represent.

Answered: 140   Skipped: 1

ANSWER CHOICES	RESPONSES	
City of Texas City	92.86%	130
Other	7.14%	10
TOTAL		140

#	IF OTHER, WHERE?	DATE
1	Pearlbrook near Amburn Road and DPS	2/19/2025 11:28 PM
2	La Marque	2/14/2025 9:13 AM
3	Grand Cay Harbor	2/13/2025 4:02 PM
4	Grand Cay Harbour development	2/13/2025 1:02 PM
5	La marqué	2/13/2025 10:04 AM
6	Entities	1/13/2025 8:28 PM
7	La marque	1/10/2025 11:41 PM
8	Mainland Park	1/9/2025 5:28 AM
9	LA marque txcty line	1/8/2025 1:08 PM
10	La Marque	1/8/2025 12:58 PM
11	City of La Marque	1/8/2025 11:02 AM
12	Santa Fe, Texas	1/8/2025 10:35 AM

Question #2



Q2 Please provide your zip code.

Answered: 140 Skipped: 1

#	RESPONSES	DATE
1	77590	3/3/2025 8:23 AM
2	77590	3/1/2025 11:39 PM
3	77590	3/1/2025 9:31 PM
4	77591	2/19/2025 11:28 PM
5	77590	2/17/2025 2:20 PM
6	77568	2/17/2025 6:24 AM
7	77590	2/16/2025 8:59 PM
8	77590	2/16/2025 7:47 AM
9	77590	2/15/2025 9:36 AM
10	77591	2/15/2025 7:11 AM
11	77590	2/15/2025 6:15 AM
12	77590	2/14/2025 3:11 PM
13	77590	2/14/2025 1:39 PM
14	77590	2/14/2025 12:56 PM
15	77590	2/14/2025 12:28 PM
16	77591	2/14/2025 11:37 AM
17	77568	2/14/2025 9:13 AM
18	77590	2/14/2025 9:09 AM
19	77591	2/14/2025 7:20 AM
20	77590	2/14/2025 6:20 AM
21	77590	2/13/2025 8:23 PM
22	77590	2/13/2025 6:55 PM
23	77590	2/13/2025 5:34 PM
24	77590	2/13/2025 4:30 PM
25	77590	2/13/2025 4:02 PM
26	77590	2/13/2025 3:54 PM
27	77590	2/13/2025 3:53 PM
28	77590	2/13/2025 2:59 PM
29	77590	2/13/2025 2:30 PM
30	775	2/13/2025 2:27 PM
31	77590	2/13/2025 1:49 PM
32	77590	2/13/2025 1:36 PM
33	77590	2/13/2025 1:02 PM

Question 2 (continued)

34	77568	2/13/2025 12:37 PM
35	77590	2/13/2025 12:30 PM
36	77590	2/13/2025 12:24 PM
37	77591	2/13/2025 12:21 PM
38	77590	2/13/2025 11:56 AM
39	77590	2/13/2025 11:11 AM
40	77590	2/13/2025 10:55 AM
41	77590	2/13/2025 10:52 AM
42	77591	2/13/2025 10:38 AM
43	77590	2/13/2025 10:37 AM
44	77599	2/13/2025 10:34 AM
45	77590	2/13/2025 10:31 AM
46	77590	2/13/2025 10:27 AM
47	77590	2/13/2025 10:21 AM
48	77590	2/13/2025 10:20 AM
49	77590	2/13/2025 10:20 AM
50	77590	2/13/2025 10:19 AM
51	77590	2/13/2025 10:19 AM
52	77590	2/13/2025 10:19 AM
53	89178	2/13/2025 10:18 AM
54	77591	2/13/2025 10:18 AM
55	77590	2/13/2025 10:12 AM
56	77591	2/13/2025 10:10 AM
57	77590	2/13/2025 10:09 AM
58	77590	2/13/2025 10:04 AM
59	77568	2/13/2025 10:04 AM
60	77590	2/13/2025 10:03 AM
61	7750	2/13/2025 10:02 AM
62	77590	2/13/2025 10:01 AM
63	77590	2/13/2025 10:01 AM
64	77590	2/13/2025 10:00 AM
65	77590	2/13/2025 10:00 AM
66	77590	2/12/2025 6:24 PM
67	77539	1/25/2025 5:47 PM
68	77590	1/24/2025 2:37 PM
69	77590	1/24/2025 1:10 PM
70	77590	1/24/2025 10:44 AM
71	77590	1/24/2025 9:20 AM

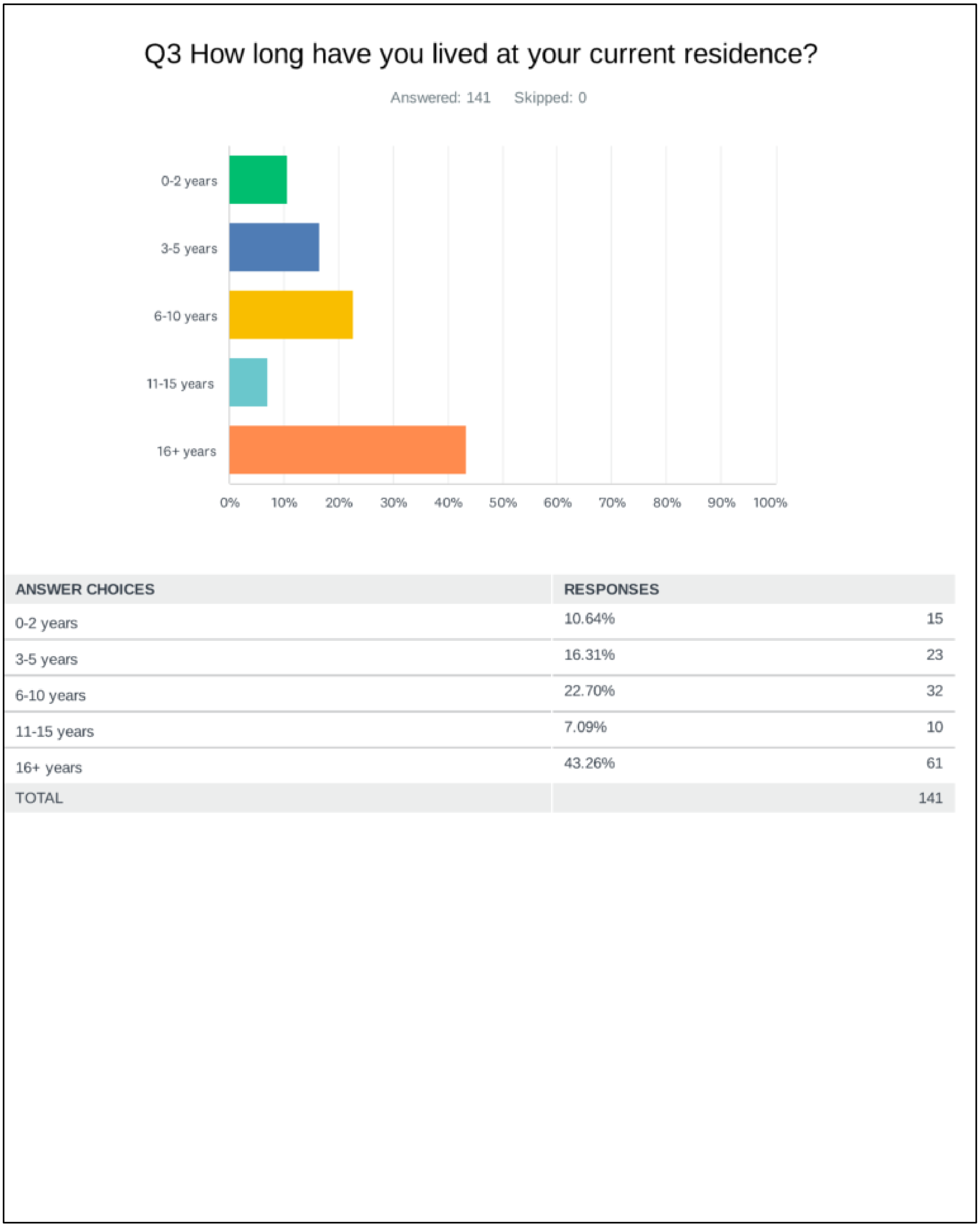
Question 2 (continued)

72	77590	1/24/2025 8:12 AM
73	77590	1/24/2025 7:51 AM
74	77590	1/23/2025 10:35 PM
75	77591	1/23/2025 9:41 PM
76	77591	1/23/2025 9:26 PM
77	77590	1/23/2025 8:19 PM
78	77590	1/23/2025 8:12 PM
79	77590	1/23/2025 8:04 PM
80	77590	1/23/2025 7:53 PM
81	77591	1/23/2025 7:32 PM
82	77591	1/23/2025 7:21 PM
83	77591	1/23/2025 7:18 PM
84	77591	1/23/2025 7:16 PM
85	77590	1/23/2025 2:01 PM
86	77590	1/16/2025 6:29 AM
87	77590	1/16/2025 5:18 AM
88	77590	1/14/2025 9:51 AM
89	29203	1/13/2025 8:28 PM
90	77568	1/10/2025 11:41 PM
91	77590	1/10/2025 6:24 PM
92	77590	1/10/2025 3:37 PM
93	77590	1/9/2025 10:51 PM
94	77599	1/9/2025 7:35 PM
95	77590	1/9/2025 3:44 PM
96	77590	1/9/2025 12:46 PM
97	77590	1/9/2025 12:36 PM
98	77591	1/9/2025 11:53 AM
99	77590	1/9/2025 11:37 AM
100	77590	1/9/2025 9:03 AM
101	77591	1/9/2025 8:38 AM
102	77590	1/9/2025 7:58 AM
103	77590	1/9/2025 5:28 AM
104	77590	1/8/2025 11:39 PM
105	77590	1/8/2025 8:57 PM
106	77568	1/8/2025 7:41 PM
107	77590	1/8/2025 7:33 PM
108	77590	1/8/2025 7:20 PM
109	77599	1/8/2025 7:02 PM

Question 2 (continued)

110	77590	1/8/2025 5:01 PM
111	77590	1/8/2025 4:29 PM
112	77590	1/8/2025 3:13 PM
113	77590	1/8/2025 3:10 PM
114	77590	1/8/2025 2:07 PM
115	77591	1/8/2025 1:56 PM
116	77590	1/8/2025 1:54 PM
117	77590	1/8/2025 1:43 PM
118	77568	1/8/2025 1:08 PM
119	77568	1/8/2025 12:58 PM
120	77591	1/8/2025 12:31 PM
121	77591	1/8/2025 12:18 PM
122	77591	1/8/2025 11:58 AM
123	77590	1/8/2025 11:54 AM
124	77590	1/8/2025 11:46 AM
125	77590	1/8/2025 11:17 AM
126	77590	1/8/2025 11:07 AM
127	77590	1/8/2025 11:06 AM
128	77568	1/8/2025 11:02 AM
129	77590	1/8/2025 10:52 AM
130	77590	1/8/2025 10:43 AM
131	77591	1/8/2025 10:35 AM
132	77510	1/8/2025 10:35 AM
133	77590	1/8/2025 10:32 AM
134	77568	1/8/2025 10:23 AM
135	77590	1/8/2025 10:12 AM
136	77590	1/8/2025 10:07 AM
137	77590	1/8/2025 10:06 AM
138	77591	1/8/2025 10:04 AM
139	77590	1/8/2025 10:03 AM
140	77590	1/8/2025 10:02 AM

Question #3

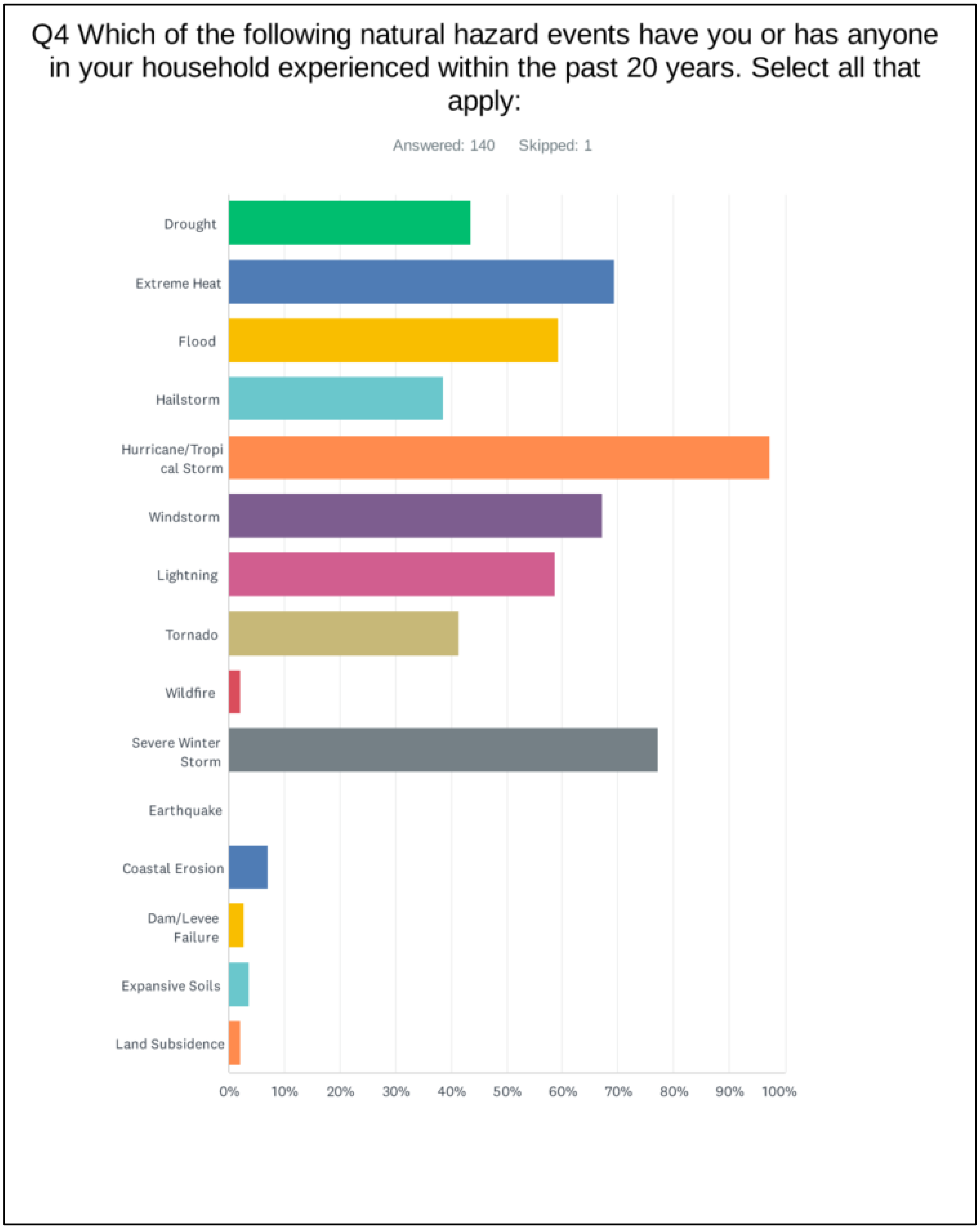


Q3 How long have you lived at your current residence?

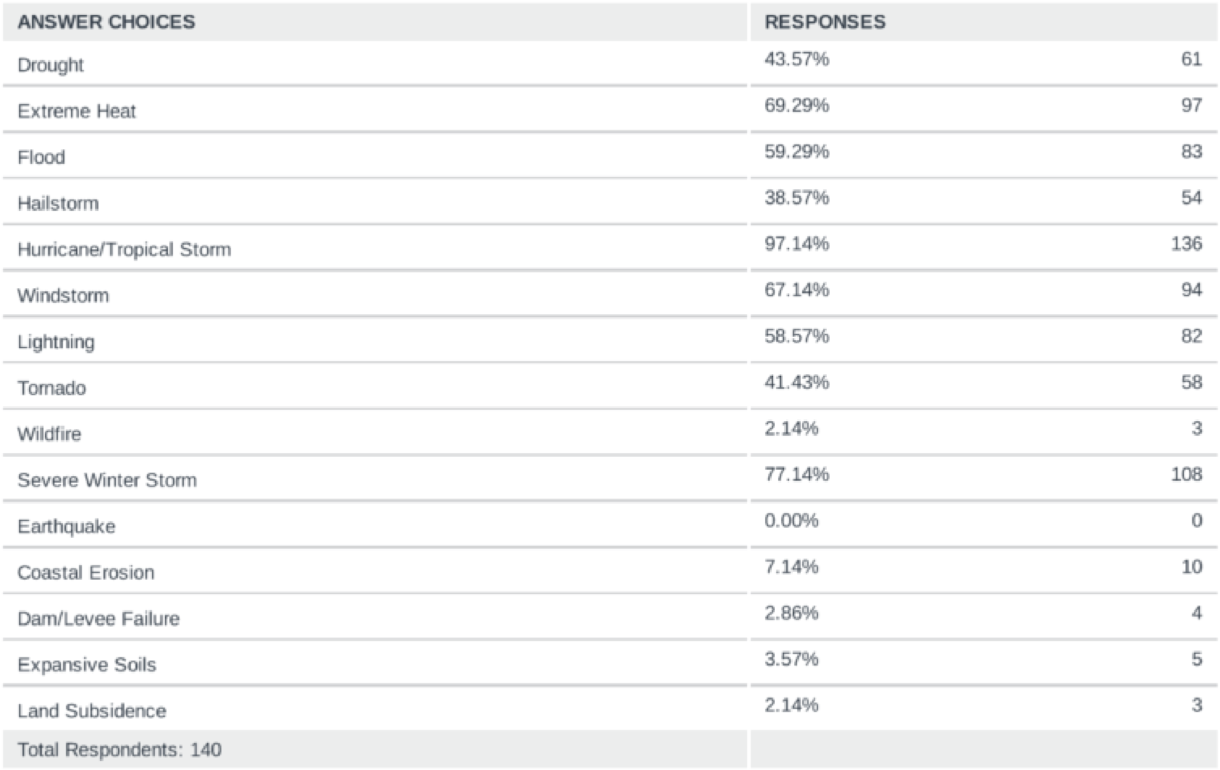
Answered: 141 Skipped: 0

ANSWER CHOICES	RESPONSES	
0-2 years	10.64%	15
3-5 years	16.31%	23
6-10 years	22.70%	32
11-15 years	7.09%	10
16+ years	43.26%	61
TOTAL		141

Question #4

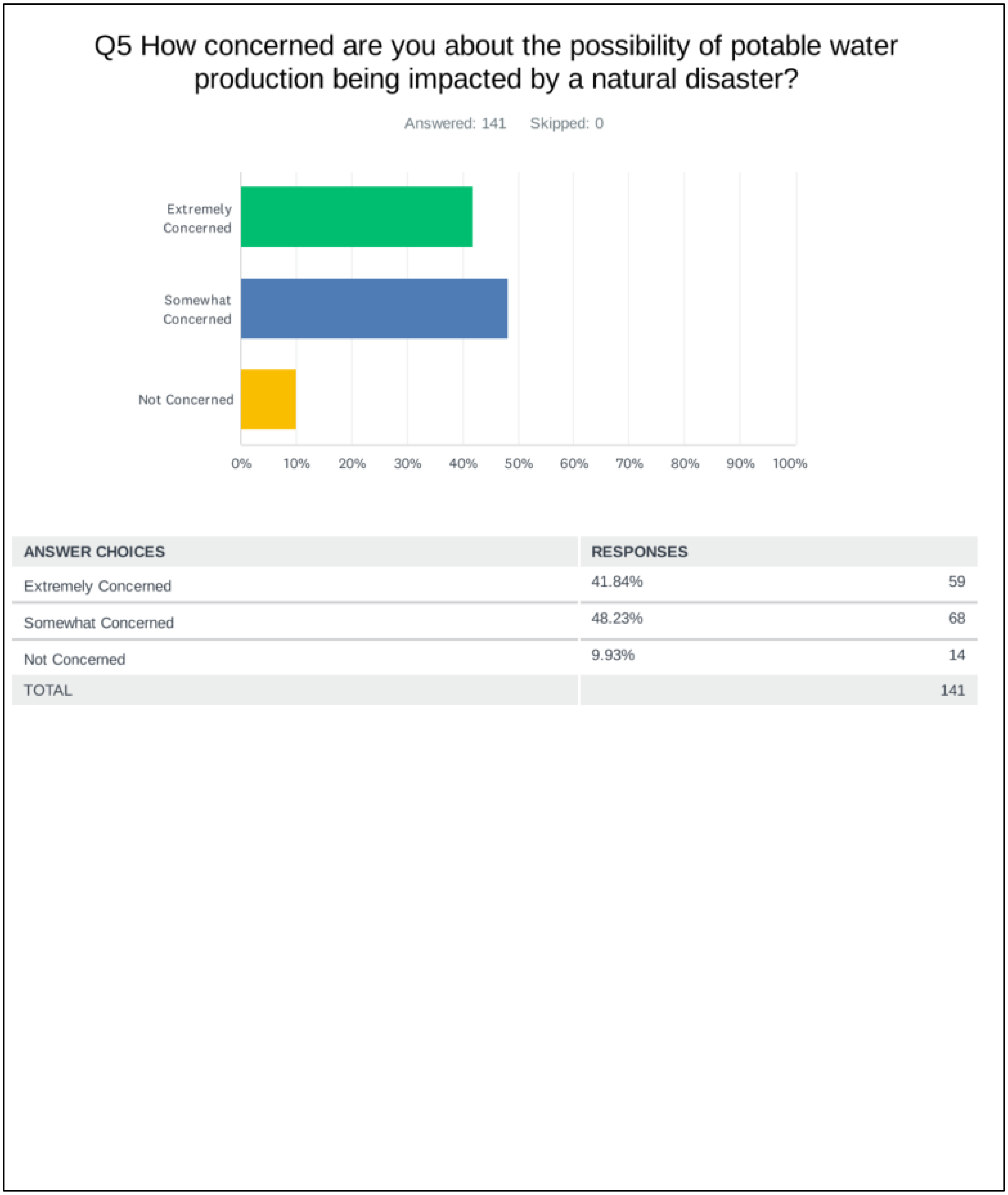

Q4 Which of the following natural hazard events have you or has anyone in your household experienced within the past 20 years. Select all that apply:
Answered: 140 Skipped: 1
Drought
Extreme Heat
Flood
Hailstorm
Hurricane/Tropical Storm
Windstorm
Lightning
Tornado
Wildfire
Severe Winter Storm
Earthquake
Coastal Erosion
Dam/Levee Failure
Expansive Soils
Land Subsidence
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

Question 4 (ontinued)



ANSWER CHOICES	RESPONSES	
Drought	43.57%	61
Extreme Heat	69.29%	97
Flood	59.29%	83
Hailstorm	38.57%	54
Hurricane/Tropical Storm	97.14%	136
Windstorm	67.14%	94
Lightning	58.57%	82
Tornado	41.43%	58
Wildfire	2.14%	3
Severe Winter Storm	77.14%	108
Earthquake	0.00%	0
Coastal Erosion	7.14%	10
Dam/Levee Failure	2.86%	4
Expansive Soils	3.57%	5
Land Subsidence	2.14%	3
Total Respondents: 140		

Question #5

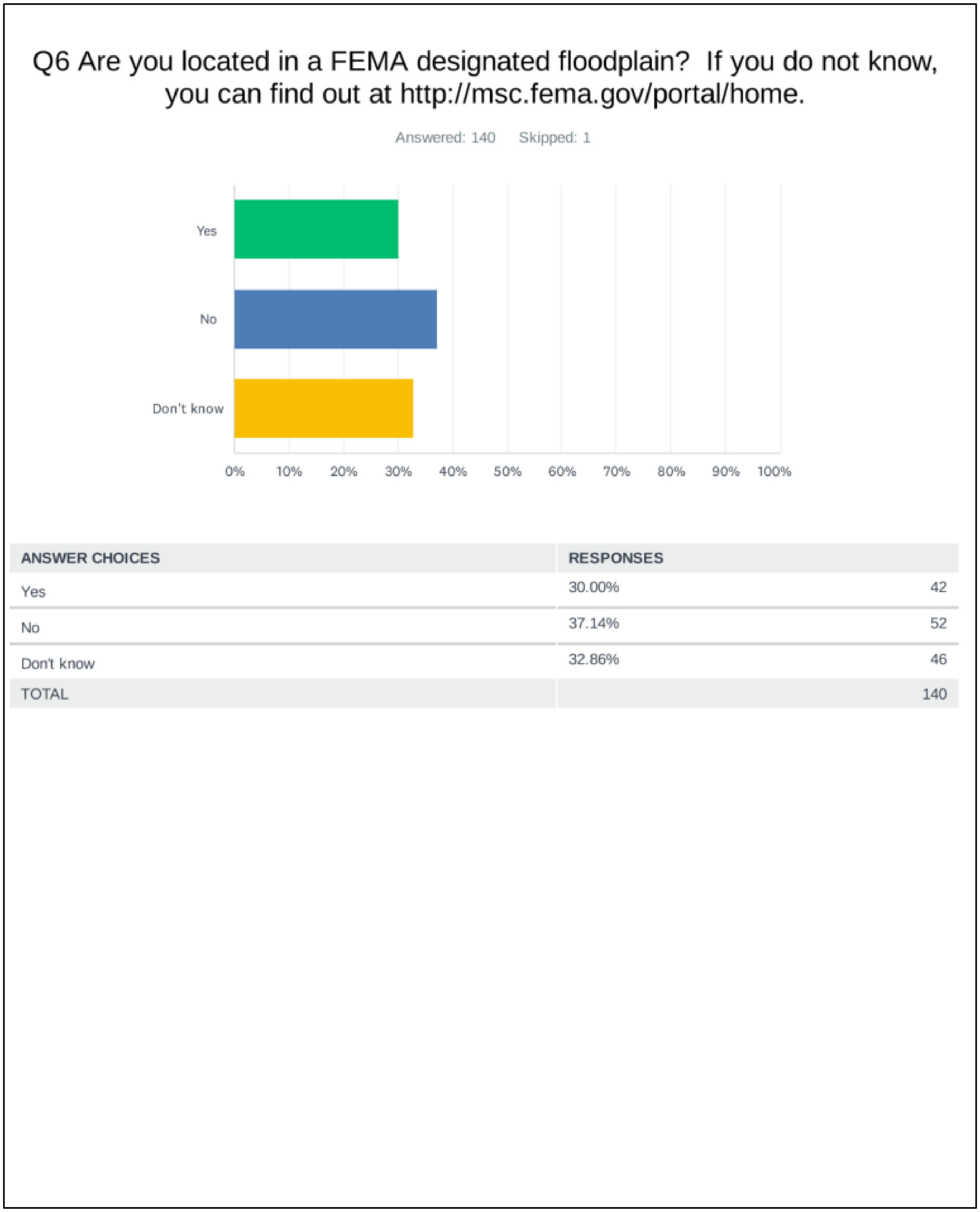


Q5 How concerned are you about the possibility of potable water production being impacted by a natural disaster?

Answered: 141 Skipped: 0

ANSWER CHOICES	RESPONSES	
Extremely Concerned	41.84%	59
Somewhat Concerned	48.23%	68
Not Concerned	9.93%	14
TOTAL		141

Question #6

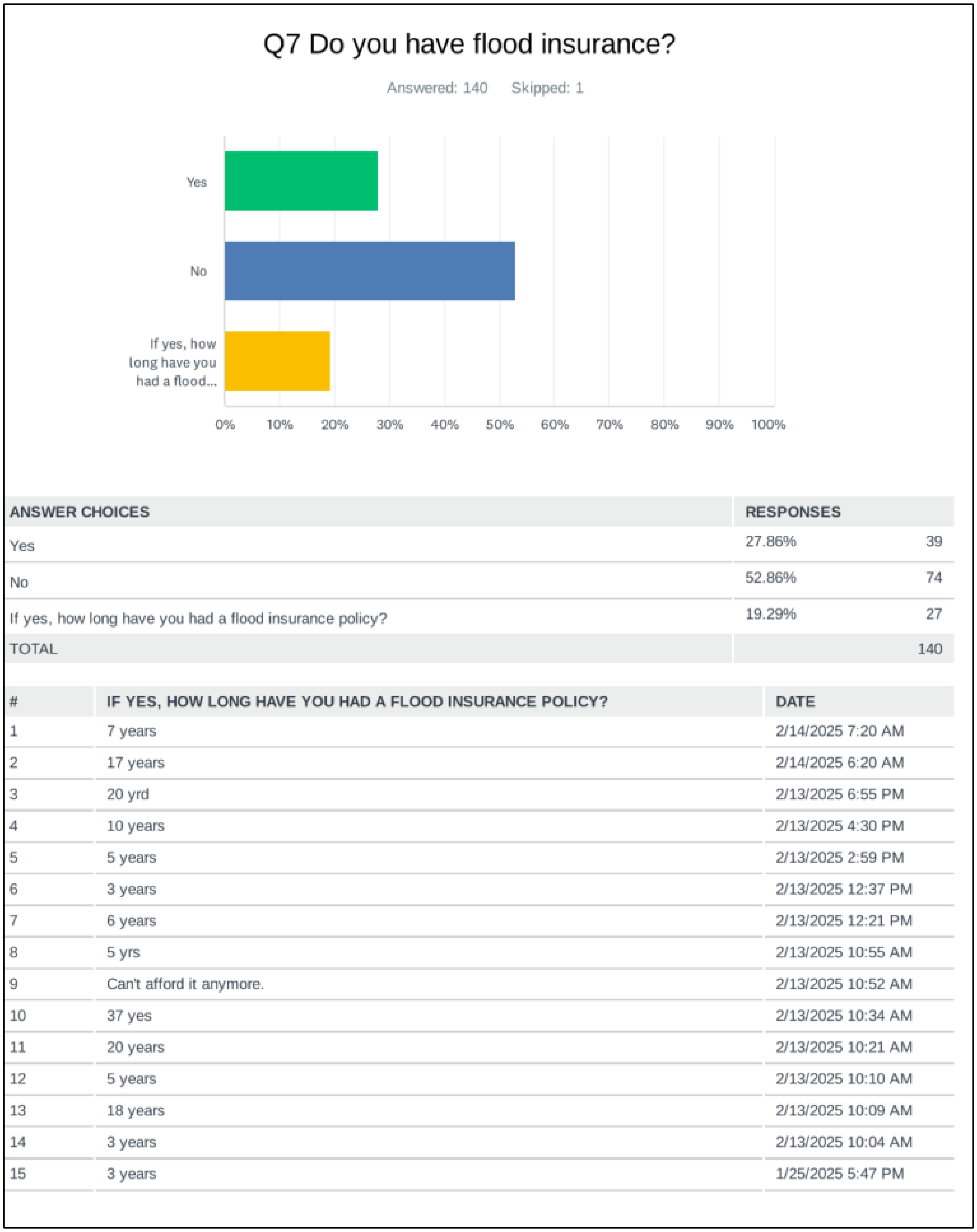


Q6 Are you located in a FEMA designated floodplain? If you do not know, you can find out at http://msc.fema.gov/portal/home.

Answered: 140 Skipped: 1

ANSWER CHOICES	RESPONSES	
Yes	30.00%	42
No	37.14%	52
Don't know	32.86%	46
TOTAL		140

Question #7



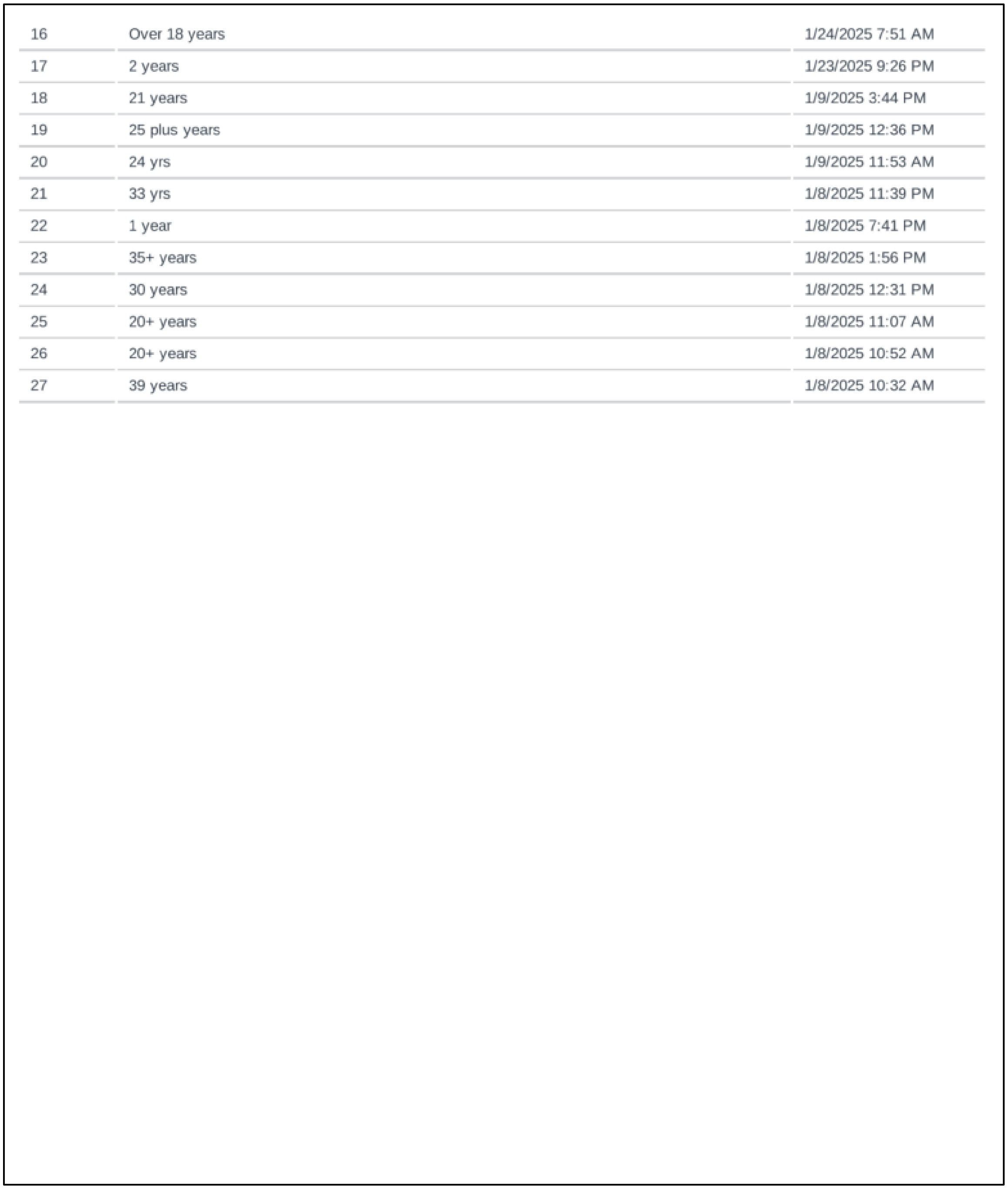
Q7 Do you have flood insurance?

Answered: 140 Skipped: 1

ANSWER CHOICES	RESPONSES	
Yes	27.86%	39
No	52.86%	74
If yes, how long have you had a flood insurance policy?	19.29%	27
TOTAL		140

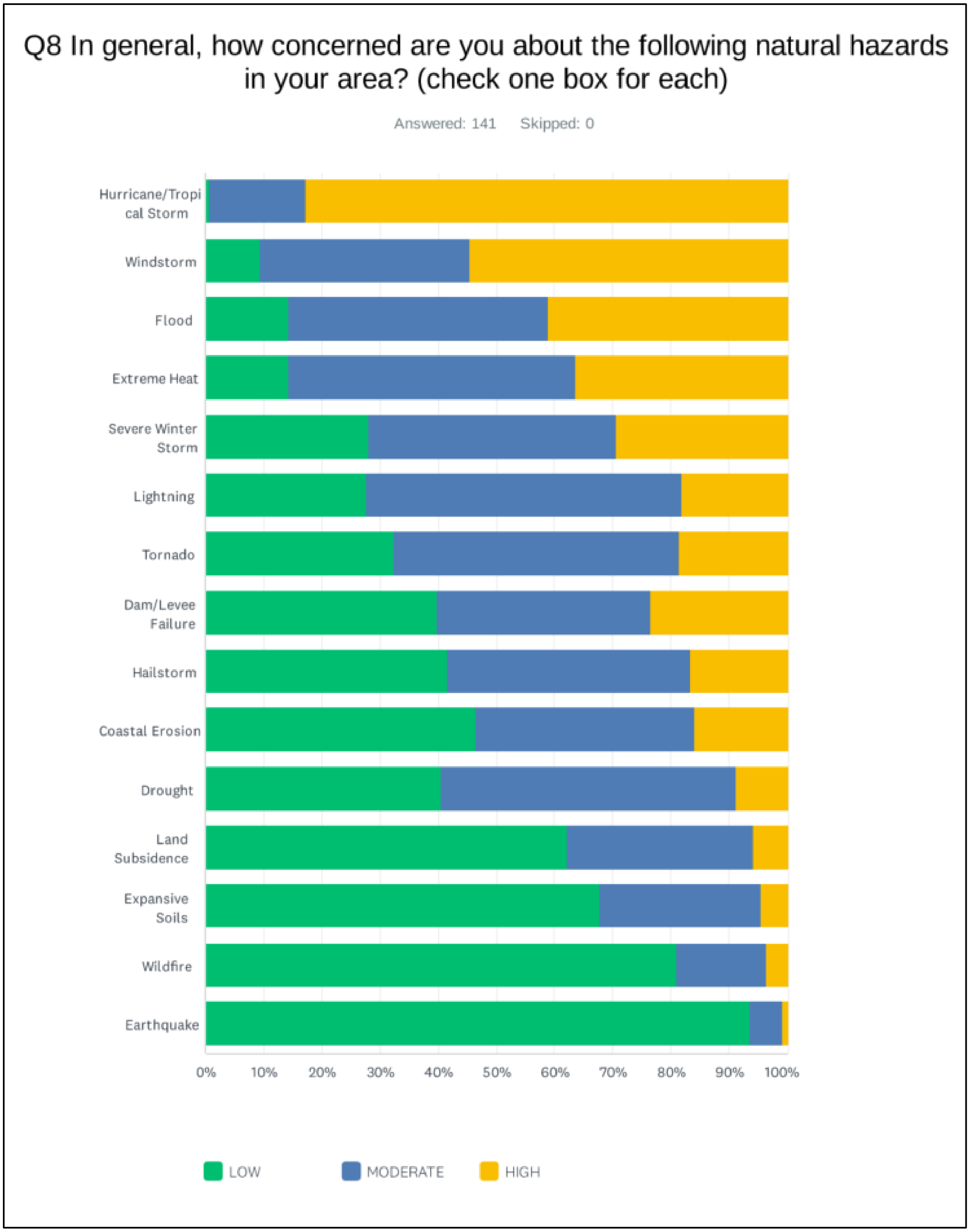
#	IF YES, HOW LONG HAVE YOU HAD A FLOOD INSURANCE POLICY?	DATE
1	7 years	2/14/2025 7:20 AM
2	17 years	2/14/2025 6:20 AM
3	20 yrd	2/13/2025 6:55 PM
4	10 years	2/13/2025 4:30 PM
5	5 years	2/13/2025 2:59 PM
6	3 years	2/13/2025 12:37 PM
7	6 years	2/13/2025 12:21 PM
8	5 yrs	2/13/2025 10:55 AM
9	Can't afford it anymore.	2/13/2025 10:52 AM
10	37 yes	2/13/2025 10:34 AM
11	20 years	2/13/2025 10:21 AM
12	5 years	2/13/2025 10:10 AM
13	18 years	2/13/2025 10:09 AM
14	3 years	2/13/2025 10:04 AM
15	3 years	1/25/2025 5:47 PM

Question 7 (continued)



16	Over 18 years	1/24/2025 7:51 AM
17	2 years	1/23/2025 9:26 PM
18	21 years	1/9/2025 3:44 PM
19	25 plus years	1/9/2025 12:36 PM
20	24 yrs	1/9/2025 11:53 AM
21	33 yrs	1/8/2025 11:39 PM
22	1 year	1/8/2025 7:41 PM
23	35+ years	1/8/2025 1:56 PM
24	30 years	1/8/2025 12:31 PM
25	20+ years	1/8/2025 11:07 AM
26	20+ years	1/8/2025 10:52 AM
27	39 years	1/8/2025 10:32 AM

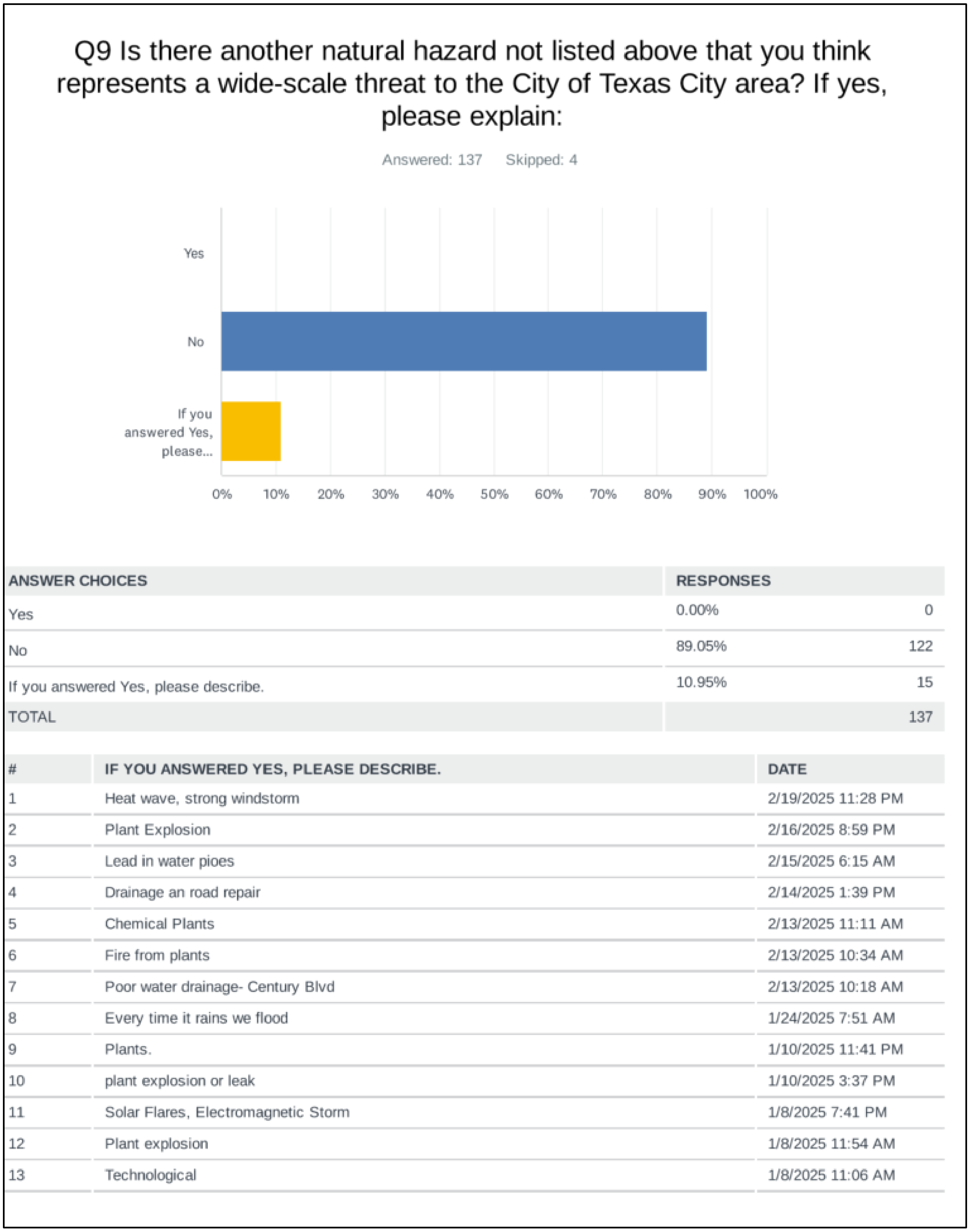
Question #8


Q8 In general, how concerned are you about the following natural hazards in your area? (check one box for each)
Answered: 141 Skipped: 0
Hurricane/Tropical Storm
Windstorm
Flood
Extreme Heat
Severe Winter Storm
Lightning
Tornado
Dam/Levee Failure
Hailstorm
Coastal Erosion
Drought
Land Subsidence
Expansive Soils
Wildfire
Earthquake
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
LOW
MODERATE
HIGH

Question 8 (continued)

	LOW	MODERATE	HIGH	TOTAL	WEIGHTED AVERAGE
Hurricane/Tropical Storm	0.71% 1	16.43% 23	82.86% 116	140	2.82
Windstorm	9.35% 13	35.97% 50	54.68% 76	139	2.45
Flood	14.39% 20	44.60% 62	41.01% 57	139	2.27
Extreme Heat	14.29% 20	49.29% 69	36.43% 51	140	2.22
Severe Winter Storm	28.06% 39	42.45% 59	29.50% 41	139	2.01
Lightning	27.54% 38	54.35% 75	18.12% 25	138	1.91
Tornado	32.37% 45	48.92% 68	18.71% 26	139	1.86
Dam/Levee Failure	39.71% 54	36.76% 50	23.53% 32	136	1.84
Hailstorm	41.61% 57	41.61% 57	16.79% 23	137	1.75
Coastal Erosion	46.38% 64	37.68% 52	15.94% 22	138	1.70
Drought	40.58% 56	50.72% 70	8.70% 12	138	1.68
Land Subsidence	62.22% 84	31.85% 43	5.93% 8	135	1.44
Expansive Soils	67.65% 92	27.94% 38	4.41% 6	136	1.37
Wildfire	80.88% 110	15.44% 21	3.68% 5	136	1.23
Earthquake	93.43% 128	5.84% 8	0.73% 1	137	1.07

Question #9



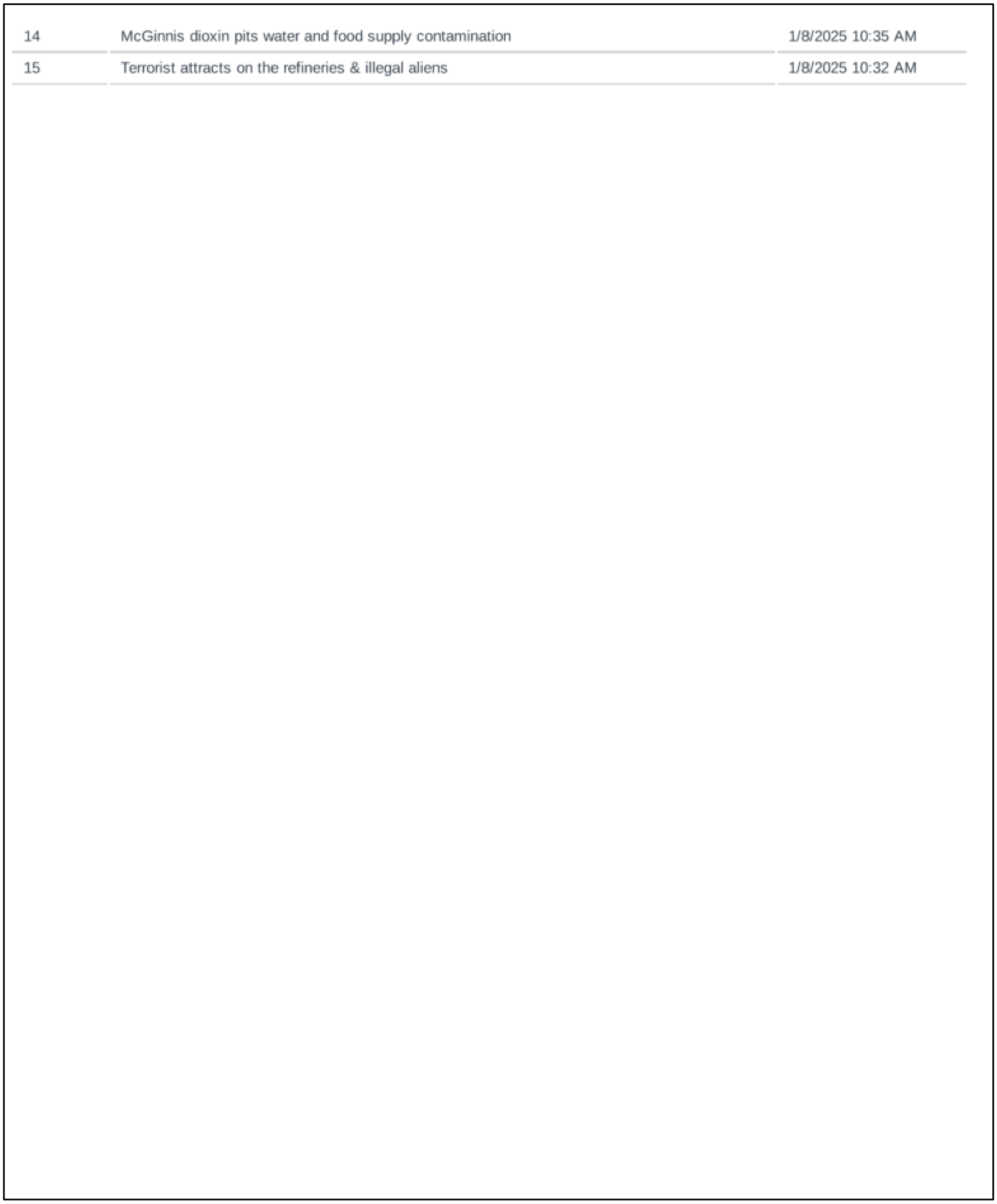
Q9 Is there another natural hazard not listed above that you think represents a wide-scale threat to the City of Texas City area? If yes, please explain:

Answered: 137 Skipped: 4

ANSWER CHOICES	RESPONSES	
Yes	0.00%	0
No	89.05%	122
If you answered Yes, please describe.	10.95%	15
TOTAL		137

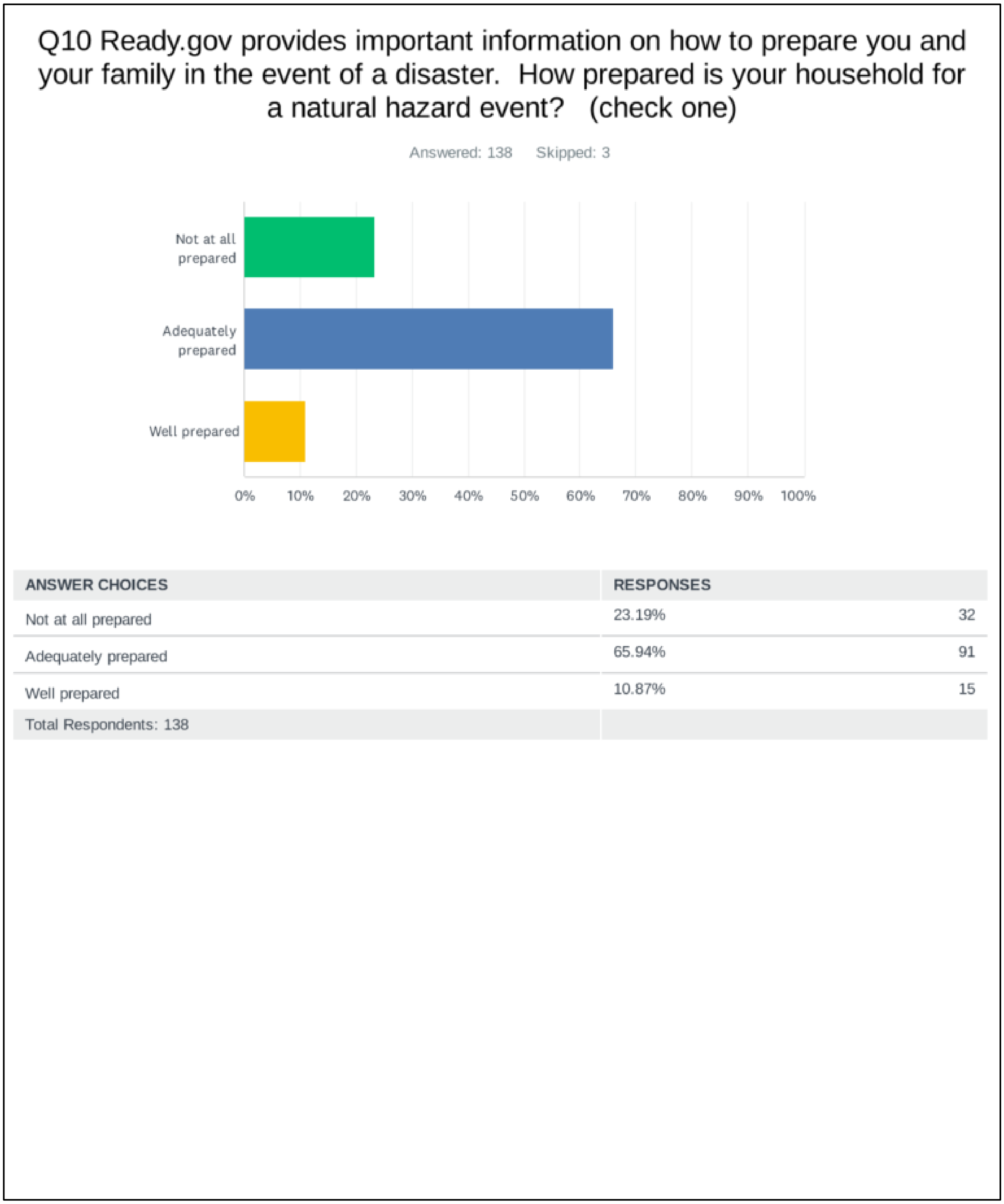
#	IF YOU ANSWERED YES, PLEASE DESCRIBE.	DATE
1	Heat wave, strong windstorm	2/19/2025 11:28 PM
2	Plant Explosion	2/16/2025 8:59 PM
3	Lead in water pioes	2/15/2025 6:15 AM
4	Drainage an road repair	2/14/2025 1:39 PM
5	Chemical Plants	2/13/2025 11:11 AM
6	Fire from plants	2/13/2025 10:34 AM
7	Poor water drainage- Century Blvd	2/13/2025 10:18 AM
8	Every time it rains we flood	1/24/2025 7:51 AM
9	Plants.	1/10/2025 11:41 PM
10	plant explosion or leak	1/10/2025 3:37 PM
11	Solar Flares, Electromagnetic Storm	1/8/2025 7:41 PM
12	Plant explosion	1/8/2025 11:54 AM
13	Technological	1/8/2025 11:06 AM

Question 9 (continued)



14	McGinnis dioxin pits water and food supply contamination	1/8/2025 10:35 AM
15	Terrorist attracts on the refineries & illegal aliens	1/8/2025 10:32 AM

Question #10

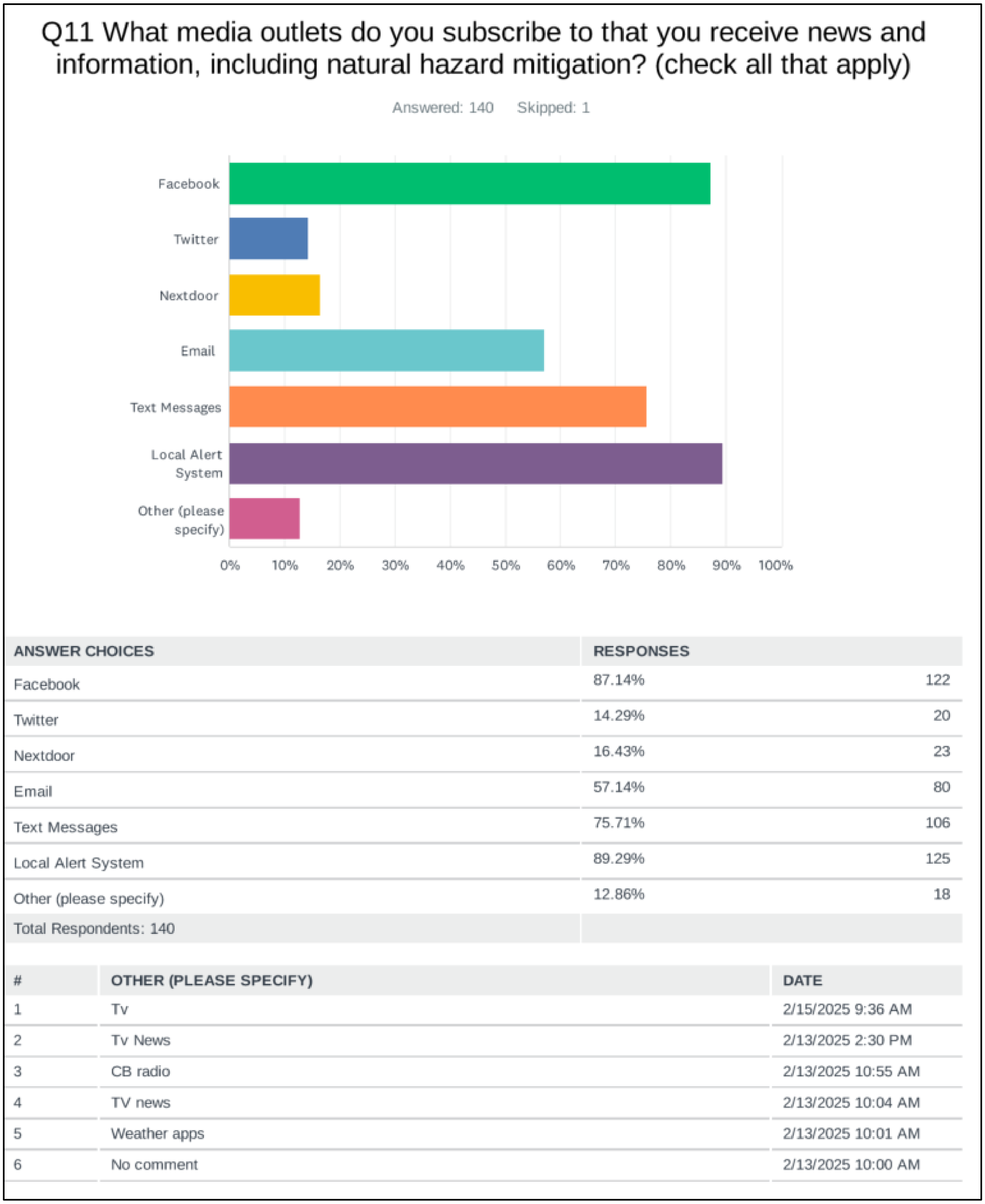


Q10 Ready.gov provides important information on how to prepare you and your family in the event of a disaster. How prepared is your household for a natural hazard event? (check one)

Answered: 138 Skipped: 3

ANSWER CHOICES	RESPONSES	
Not at all prepared	23.19%	32
Adequately prepared	65.94%	91
Well prepared	10.87%	15
Total Respondents: 138		

Question #11



Q11 What media outlets do you subscribe to that you receive news and information, including natural hazard mitigation? (check all that apply)

Answered: 140 Skipped: 1

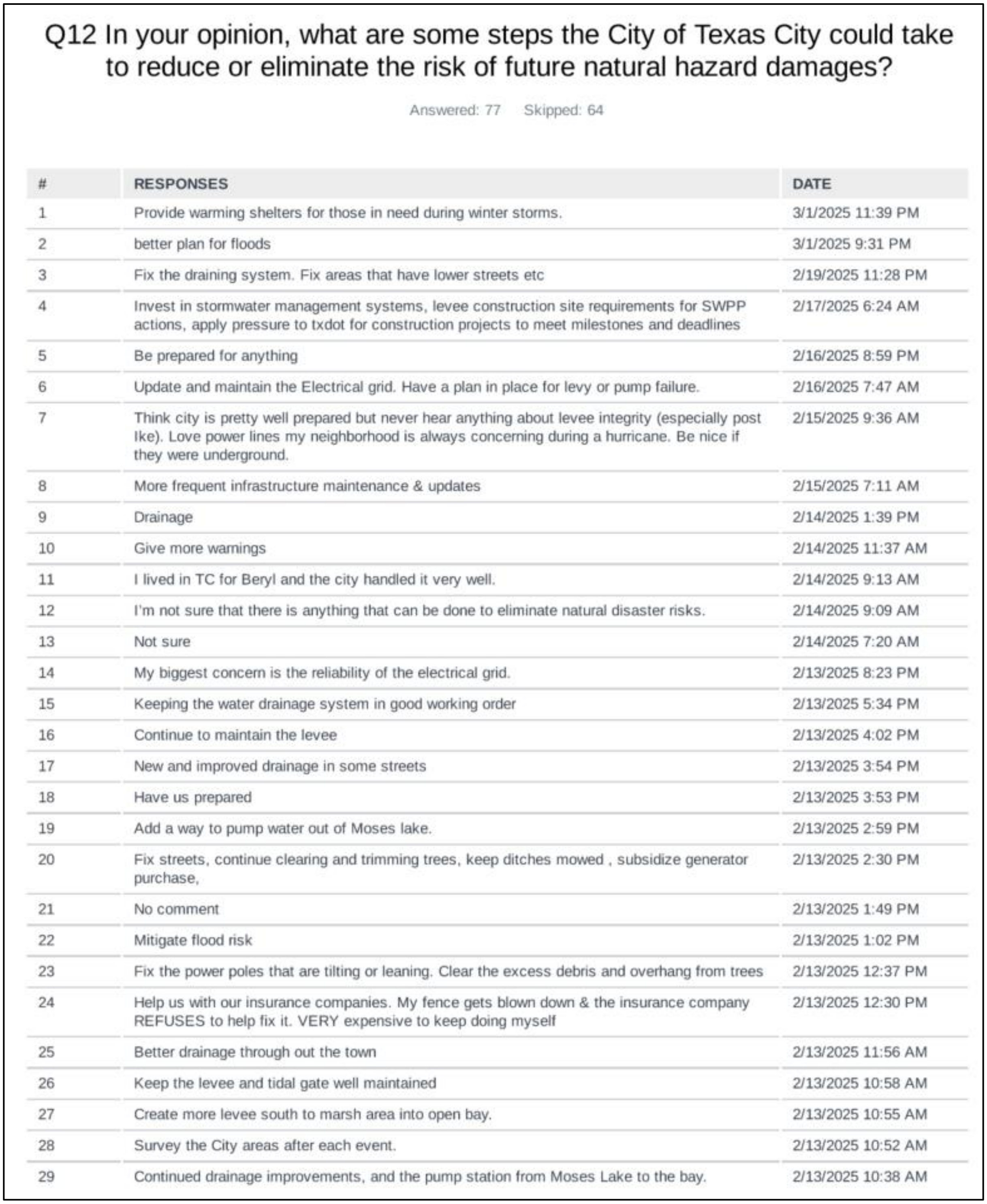
ANSWER CHOICES	RESPONSES	
Facebook	87.14%	122
Twitter	14.29%	20
Nextdoor	16.43%	23
Email	57.14%	80
Text Messages	75.71%	106
Local Alert System	89.29%	125
Other (please specify)	12.86%	18
Total Respondents: 140		

#	OTHER (PLEASE SPECIFY)	DATE
1	Tv	2/15/2025 9:36 AM
2	Tv News	2/13/2025 2:30 PM
3	CB radio	2/13/2025 10:55 AM
4	TV news	2/13/2025 10:04 AM
5	Weather apps	2/13/2025 10:01 AM
6	No comment	2/13/2025 10:00 AM

Question 11 (continued)

7	Local news	1/24/2025 7:51 AM
8	ABC-13	1/23/2025 9:41 PM
9	Everbridge. I am a member of CERT	1/23/2025 8:12 PM
10	Local TV news	1/23/2025 8:04 PM
11	Weather	1/9/2025 10:51 PM
12	TV stations	1/9/2025 11:53 AM
13	Television	1/9/2025 9:03 AM
14	Local Newstations, DTN (Employer), NWS, Everbridge (Employer)	1/8/2025 7:41 PM
15	The Post Newspaper	1/8/2025 5:01 PM
16	YouTube	1/8/2025 11:54 AM
17	Local news	1/8/2025 11:06 AM
18	Fox news Fox26	1/8/2025 10:23 AM

Question #12



Q12 In your opinion, what are some steps the City of Texas City could take to reduce or eliminate the risk of future natural hazard damages?

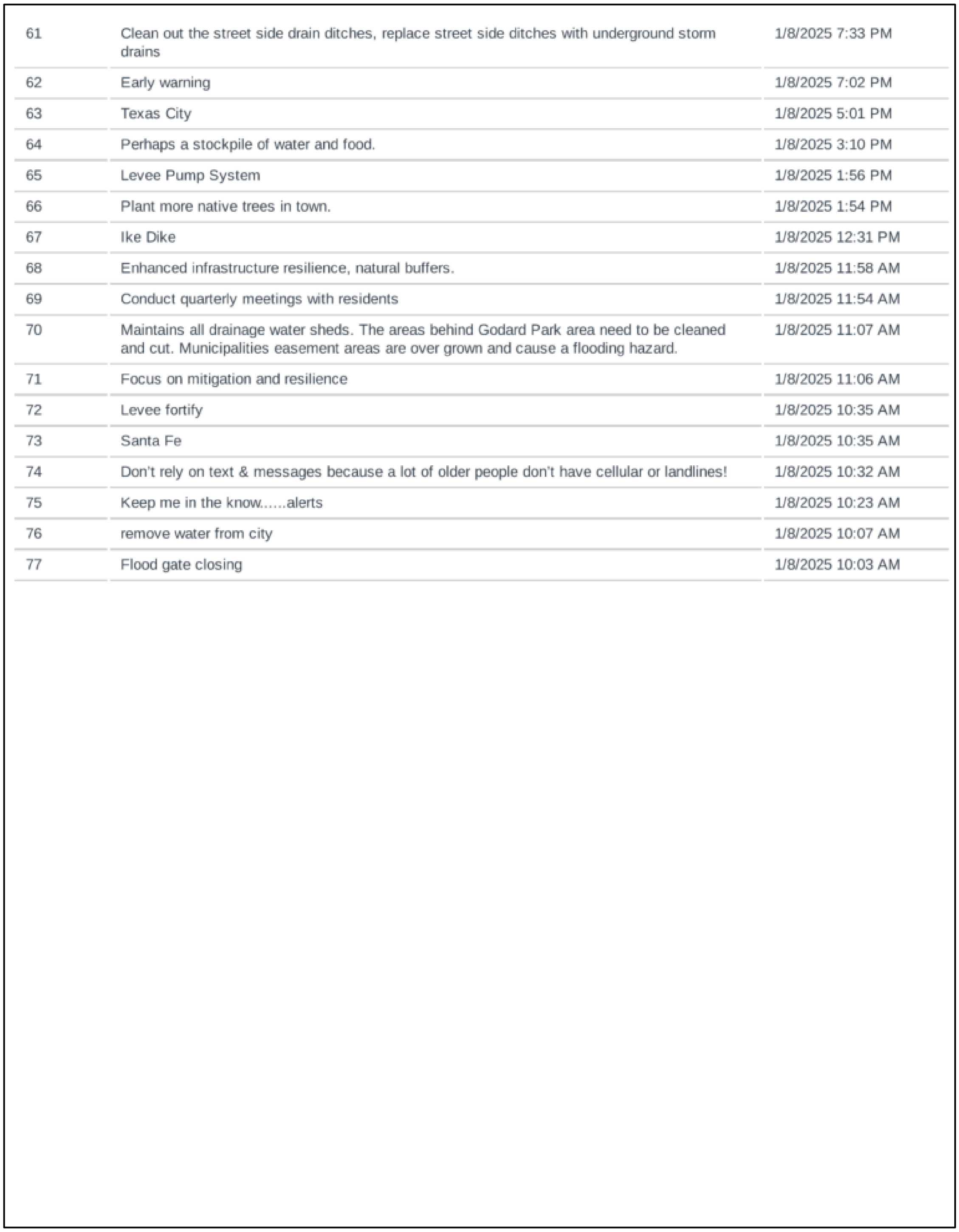
Answered: 77 Skipped: 64

#	RESPONSES	DATE
1	Provide warming shelters for those in need during winter storms.	3/1/2025 11:39 PM
2	better plan for floods	3/1/2025 9:31 PM
3	Fix the draining system. Fix areas that have lower streets etc	2/19/2025 11:28 PM
4	Invest in stormwater management systems, levee construction site requirements for SWPP actions, apply pressure to txdot for construction projects to meet milestones and deadlines	2/17/2025 6:24 AM
5	Be prepared for anything	2/16/2025 8:59 PM
6	Update and maintain the Electrical grid. Have a plan in place for levy or pump failure.	2/16/2025 7:47 AM
7	Think city is pretty well prepared but never hear anything about levee integrity (especially post Ike). Love power lines my neighborhood is always concerning during a hurricane. Be nice if they were underground.	2/15/2025 9:36 AM
8	More frequent infrastructure maintenance & updates	2/15/2025 7:11 AM
9	Drainage	2/14/2025 1:39 PM
10	Give more warnings	2/14/2025 11:37 AM
11	I lived in TC for Beryl and the city handled it very well.	2/14/2025 9:13 AM
12	I'm not sure that there is anything that can be done to eliminate natural disaster risks.	2/14/2025 9:09 AM
13	Not sure	2/14/2025 7:20 AM
14	My biggest concern is the reliability of the electrical grid.	2/13/2025 8:23 PM
15	Keeping the water drainage system in good working order	2/13/2025 5:34 PM
16	Continue to maintain the levee	2/13/2025 4:02 PM
17	New and improved drainage in some streets	2/13/2025 3:54 PM
18	Have us prepared	2/13/2025 3:53 PM
19	Add a way to pump water out of Moses lake.	2/13/2025 2:59 PM
20	Fix streets, continue clearing and trimming trees, keep ditches mowed , subsidize generator purchase,	2/13/2025 2:30 PM
21	No comment	2/13/2025 1:49 PM
22	Mitigate flood risk	2/13/2025 1:02 PM
23	Fix the power poles that are tilting or leaning. Clear the excess debris and overhang from trees	2/13/2025 12:37 PM
24	Help us with our insurance companies. My fence gets blown down & the insurance company REFUSES to help fix it. VERY expensive to keep doing myself	2/13/2025 12:30 PM
25	Better drainage through out the town	2/13/2025 11:56 AM
26	Keep the levee and tidal gate well maintained	2/13/2025 10:58 AM
27	Create more levee south to marsh area into open bay.	2/13/2025 10:55 AM
28	Survey the City areas after each event.	2/13/2025 10:52 AM
29	Continued drainage improvements, and the pump station from Moses Lake to the bay.	2/13/2025 10:38 AM

Question 12 (continued)

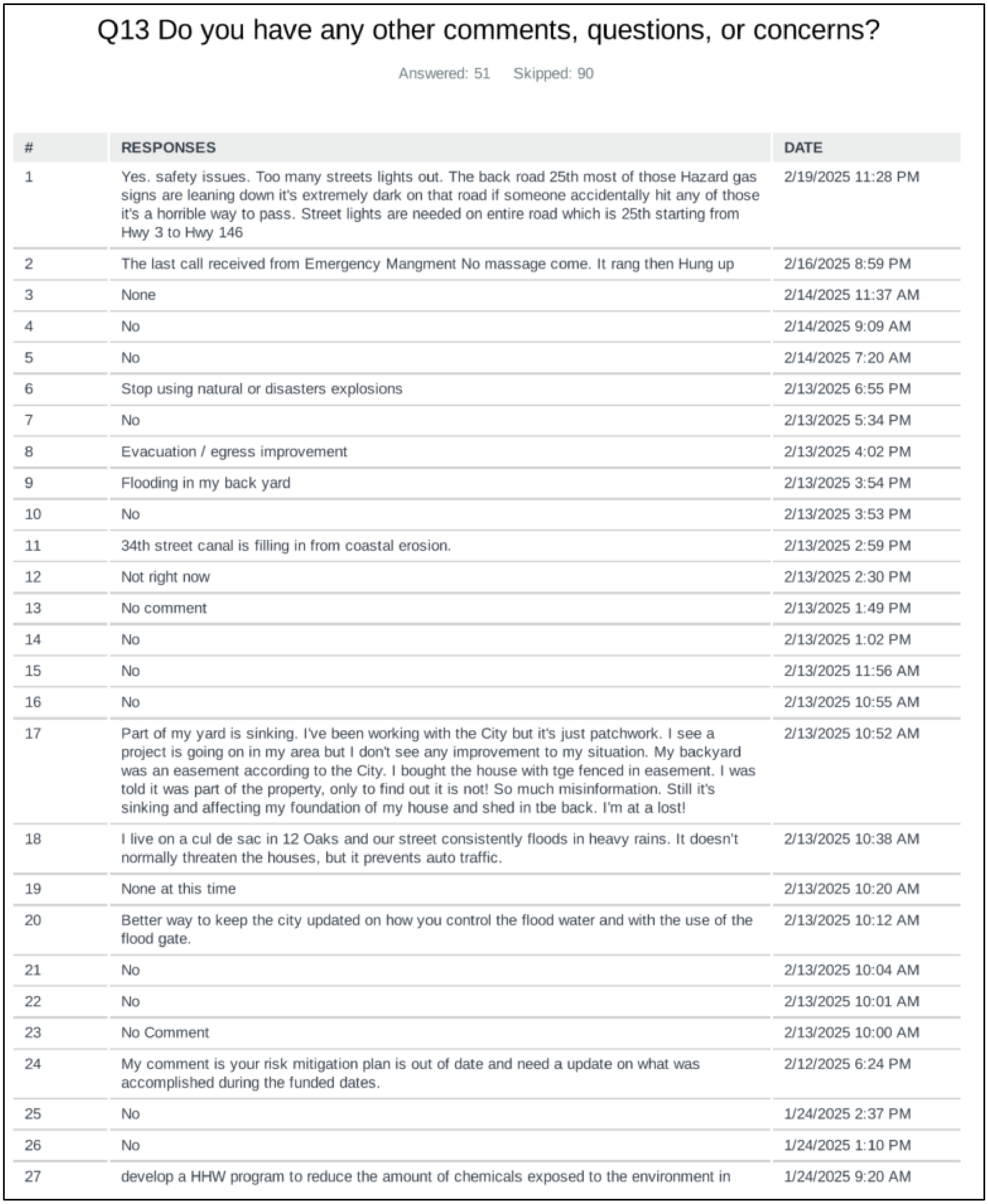
30	Continue to maintain drainage systems	2/13/2025 10:37 AM
31	Always be prepared ane keep community updated for all incidents as well as air quality. Help seniors prepare if needed.ts	2/13/2025 10:34 AM
32	Keep city clean, maintain drainage systems and communicate with community	2/13/2025 10:20 AM
33	Improve drainage throughout the city.	2/13/2025 10:19 AM
34	Drainage, Evac Routes not dependent on the 45, take care of those without transportation or means to prepare for disasters, provide generators at reasonable prices	2/13/2025 10:18 AM
35	N/A	2/13/2025 10:12 AM
36	texas city	2/13/2025 10:03 AM
37	Spread notifications on time	2/13/2025 10:02 AM
38	Texas City keeps us very well informed with phone messages, texts, etc. I feel very informed during weather events.	2/13/2025 10:01 AM
39	No comment	2/13/2025 10:00 AM
40	Build up the levee and all industrial area flood gates to keep the water away from the city and public water system	2/12/2025 6:24 PM
41	Expand on early warning system	1/25/2025 5:47 PM
42	Keeping trees trimmed from power lines and informing residents how important it is to keep trash out of their yards and the streets so it doesn't cause flooding.	1/24/2025 1:10 PM
43	It was my understanding the city was already prepared thanks to the years of development of our Emergency Managment dept.	1/24/2025 10:44 AM
44	Help with the flooding	1/24/2025 7:51 AM
45	I think Texas City does well managing natural hazard damage already.	1/23/2025 10:35 PM
46	NA	1/23/2025 9:26 PM
47	fixing roads and drainage	1/23/2025 8:12 PM
48	Texas City has done a failrly good job so far	1/23/2025 8:04 PM
49	Better communication with population, as well more patrolling to assess the problems we have on our streets	1/23/2025 7:32 PM
50	Mailing informative letters to people about natural hazards in the appropriate time or what they are and what they can do to property, and how to help prevent damages	1/23/2025 7:21 PM
51	Na	1/23/2025 7:18 PM
52	Nothing immediately comes to mind.	1/23/2025 2:01 PM
53	COLUMBIA	1/13/2025 8:28 PM
54	communication is key	1/10/2025 3:37 PM
55	Increase the elevation of the inner levee and internal drainage capability, allowing water to get to the pumps faster.	1/9/2025 10:51 PM
56	Improve drainage	1/9/2025 11:53 AM
57	Save money and have a plan for local assistance to homeowners for repairs	1/9/2025 9:03 AM
58	Improve damaged roads, as well as drainage issues. Updating and maintaining drainage throughout the city regularly. Clearing power lines throughout the city of trees is also a very big factor	1/9/2025 7:58 AM
59	Tornado siren	1/9/2025 5:28 AM
60	Under ground utility across the city	1/8/2025 8:57 PM

Question 12 (continued)



61	Clean out the street side drain ditches, replace street side ditches with underground storm drains	1/8/2025 7:33 PM
62	Early warning	1/8/2025 7:02 PM
63	Texas City	1/8/2025 5:01 PM
64	Perhaps a stockpile of water and food.	1/8/2025 3:10 PM
65	Levee Pump System	1/8/2025 1:56 PM
66	Plant more native trees in town.	1/8/2025 1:54 PM
67	Ike Dike	1/8/2025 12:31 PM
68	Enhanced infrastructure resilience, natural buffers.	1/8/2025 11:58 AM
69	Conduct quarterly meetings with residents	1/8/2025 11:54 AM
70	Maintains all drainage water sheds. The areas behind Godard Park area need to be cleaned and cut. Municipalities easement areas are over grown and cause a flooding hazard.	1/8/2025 11:07 AM
71	Focus on mitigation and resilience	1/8/2025 11:06 AM
72	Levee fortify	1/8/2025 10:35 AM
73	Santa Fe	1/8/2025 10:35 AM
74	Don't rely on text & messages because a lot of older people don't have cellular or landlines!	1/8/2025 10:32 AM
75	Keep me in the know......alerts	1/8/2025 10:23 AM
76	remove water from city	1/8/2025 10:07 AM
77	Flood gate closing	1/8/2025 10:03 AM

Question #13

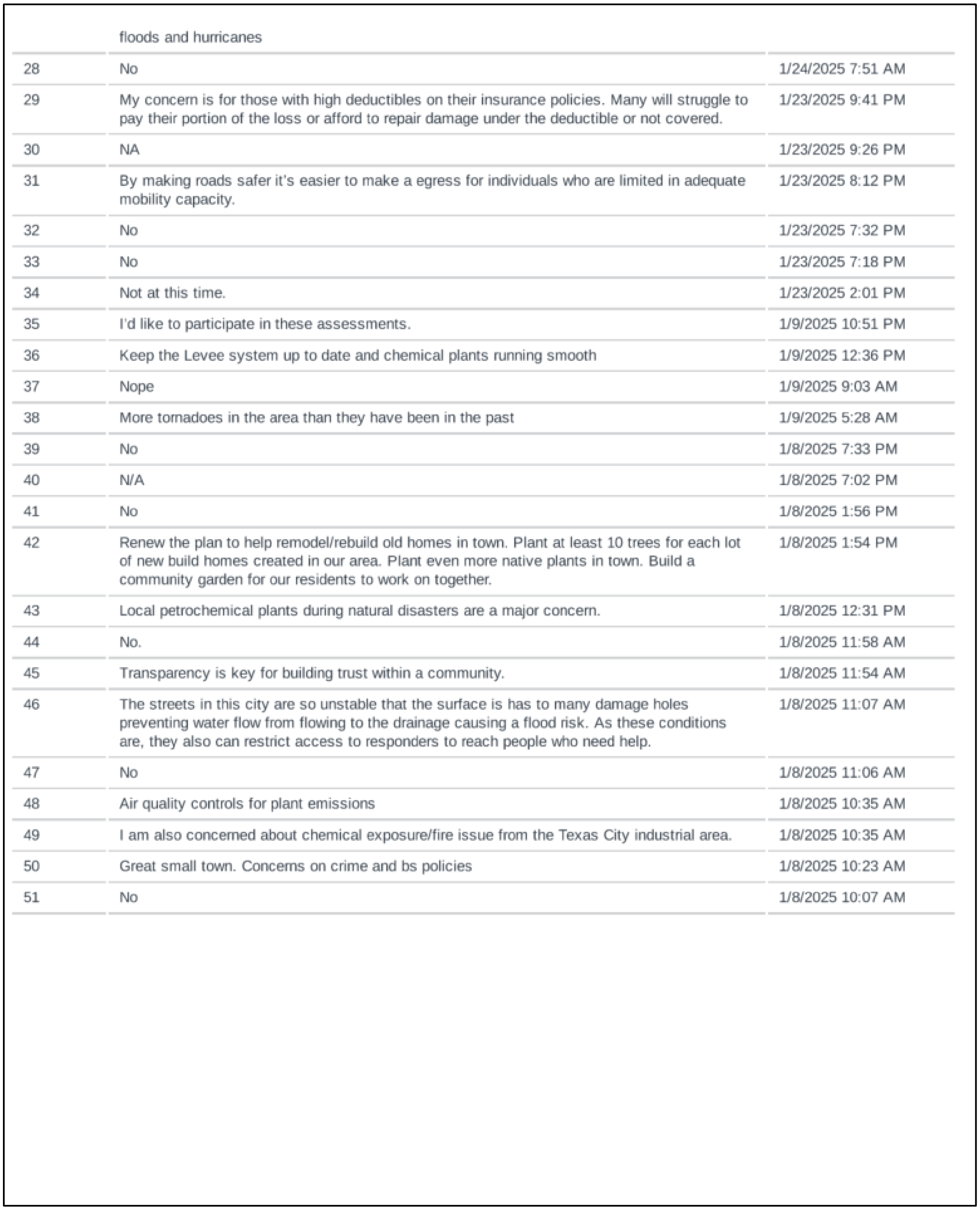


Q13 Do you have any other comments, questions, or concerns?

Answered: 51 Skipped: 90

#	RESPONSES	DATE
1	Yes. safety issues. Too many streets lights out. The back road 25th most of those Hazard gas signs are leaning down it's extremely dark on that road if someone accidentally hit any of those it's a horrible way to pass. Street lights are needed on entire road which is 25th starting from Hwy 3 to Hwy 146	2/19/2025 11:28 PM
2	The last call received from Emergency Mangment No massage come. It rang then Hung up	2/16/2025 8:59 PM
3	None	2/14/2025 11:37 AM
4	No	2/14/2025 9:09 AM
5	No	2/14/2025 7:20 AM
6	Stop using natural or disasters explosions	2/13/2025 6:55 PM
7	No	2/13/2025 5:34 PM
8	Evacuation / egress improvement	2/13/2025 4:02 PM
9	Flooding in my back yard	2/13/2025 3:54 PM
10	No	2/13/2025 3:53 PM
11	34th street canal is filling in from coastal erosion.	2/13/2025 2:59 PM
12	Not right now	2/13/2025 2:30 PM
13	No comment	2/13/2025 1:49 PM
14	No	2/13/2025 1:02 PM
15	No	2/13/2025 11:56 AM
16	No	2/13/2025 10:55 AM
17	Part of my yard is sinking. I've been working with the City but it's just patchwork. I see a project is going on in my area but I don't see any improvement to my situation. My backyard was an easement according to the City. I bought the house with tge fenced in easement. I was told it was part of the property, only to find out it is not! So much misinformation. Still it's sinking and affecting my foundation of my house and shed in tbe back. I'm at a lost!	2/13/2025 10:52 AM
18	I live on a cul de sac in 12 Oaks and our street consistently floods in heavy rains. It doesn't normally threaten the houses, but it prevents auto traffic.	2/13/2025 10:38 AM
19	None at this time	2/13/2025 10:20 AM
20	Better way to keep the city updated on how you control the flood water and with the use of the flood gate.	2/13/2025 10:12 AM
21	No	2/13/2025 10:04 AM
22	No	2/13/2025 10:01 AM
23	No Comment	2/13/2025 10:00 AM
24	My comment is your risk mitigation plan is out of date and need a update on what was accomplished during the funded dates.	2/12/2025 6:24 PM
25	No	1/24/2025 2:37 PM
26	No	1/24/2025 1:10 PM
27	develop a HHW program to reduce the amount of chemicals exposed to the environment in	1/24/2025 9:20 AM

Question 13 (continued)



	floods and hurricanes	
28	No	1/24/2025 7:51 AM
29	My concern is for those with high deductibles on their insurance policies. Many will struggle to pay their portion of the loss or afford to repair damage under the deductible or not covered.	1/23/2025 9:41 PM
30	NA	1/23/2025 9:26 PM
31	By making roads safer it's easier to make a egress for individuals who are limited in adequate mobility capacity.	1/23/2025 8:12 PM
32	No	1/23/2025 7:32 PM
33	No	1/23/2025 7:18 PM
34	Not at this time.	1/23/2025 2:01 PM
35	I'd like to participate in these assessments.	1/9/2025 10:51 PM
36	Keep the Levee system up to date and chemical plants running smooth	1/9/2025 12:36 PM
37	Nope	1/9/2025 9:03 AM
38	More tornadoes in the area than they have been in the past	1/9/2025 5:28 AM
39	No	1/8/2025 7:33 PM
40	N/A	1/8/2025 7:02 PM
41	No	1/8/2025 1:56 PM
42	Renew the plan to help remodel/rebuild old homes in town. Plant at least 10 trees for each lot of new build homes created in our area. Plant even more native plants in town. Build a community garden for our residents to work on together.	1/8/2025 1:54 PM
43	Local petrochemical plants during natural disasters are a major concern.	1/8/2025 12:31 PM
44	No.	1/8/2025 11:58 AM
45	Transparency is key for building trust within a community.	1/8/2025 11:54 AM
46	The streets in this city are so unstable that the surface is has to many damage holes preventing water flow from flowing to the drainage causing a flood risk. As these conditions are, they also can restrict access to responders to reach people who need help.	1/8/2025 11:07 AM
47	No	1/8/2025 11:06 AM
48	Air quality controls for plant emissions	1/8/2025 10:35 AM
49	I am also concerned about chemical exposure/fire issue from the Texas City industrial area.	1/8/2025 10:35 AM
50	Great small town. Concerns on crime and bs policies	1/8/2025 10:23 AM
51	No	1/8/2025 10:07 AM

Question #14

Q14 If you would like to receive information regarding upcoming public events and other participatory opportunities regarding this hazard mitigation plan, please provide your email address below.

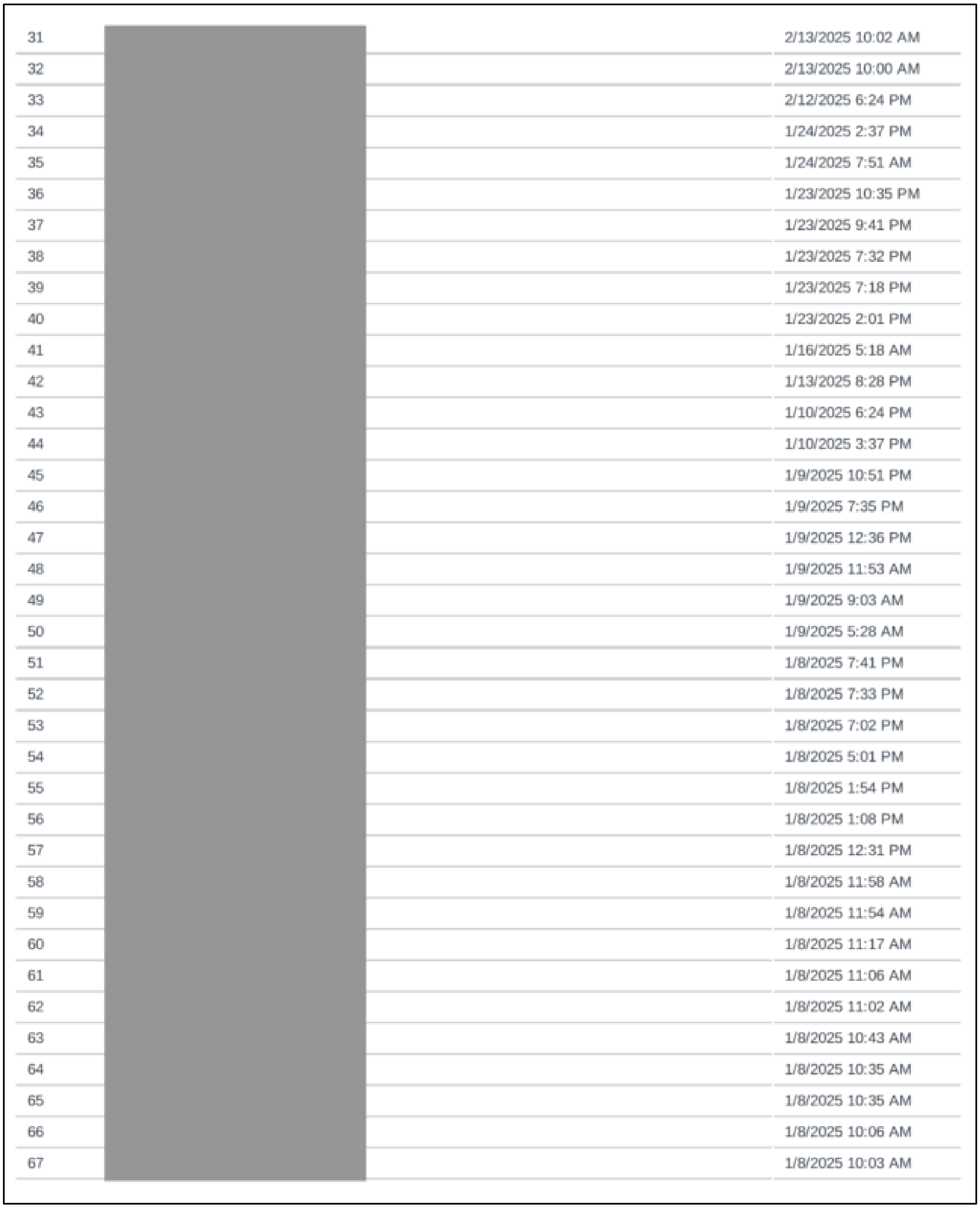
Answered: 67 Skipped: 74

Personal email addresses have been redacted for privacy.

#	RESPONSES	DATE
1	[redacted]	3/1/2025 11:39 PM
2	[redacted]	3/1/2025 9:31 PM
3	[redacted]	2/17/2025 6:24 AM
4	[redacted]	2/16/2025 8:59 PM
5	[redacted]	2/15/2025 6:15 AM
6	[redacted]	2/14/2025 1:39 PM
7	[redacted]	2/14/2025 11:37 AM
8	[redacted]	2/14/2025 9:13 AM
9	[redacted]	2/14/2025 7:20 AM
10	[redacted]	2/13/2025 8:23 PM
11	[redacted]	2/13/2025 6:55 PM
12	[redacted]	2/13/2025 4:30 PM
13	[redacted]	2/13/2025 4:02 PM
14	[redacted]	2/13/2025 3:53 PM
15	[redacted]	2/13/2025 1:49 PM
16	[redacted]	2/13/2025 1:02 PM
17	[redacted]	2/13/2025 12:37 PM
18	[redacted]	2/13/2025 11:56 AM
19	[redacted]	2/13/2025 10:58 AM
20	[redacted]	2/13/2025 10:55 AM
21	[redacted]	2/13/2025 10:52 AM
22	[redacted]	2/13/2025 10:38 AM
23	[redacted]	2/13/2025 10:37 AM
24	[redacted]	2/13/2025 10:34 AM
25	[redacted]	2/13/2025 10:20 AM
26	[redacted]	2/13/2025 10:18 AM
27	[redacted]	2/13/2025 10:12 AM
28	[redacted]	2/13/2025 10:04 AM
29	[redacted]	2/13/2025 10:04 AM
30	[redacted]	2/13/2025 10:03 AM

Question 14 (continued)

Personal email addresses have been redacted for privacy.



31	[redacted]	2/13/2025 10:02 AM
32	[redacted]	2/13/2025 10:00 AM
33	[redacted]	2/12/2025 6:24 PM
34	[redacted]	1/24/2025 2:37 PM
35	[redacted]	1/24/2025 7:51 AM
36	[redacted]	1/23/2025 10:35 PM
37	[redacted]	1/23/2025 9:41 PM
38	[redacted]	1/23/2025 7:32 PM
39	[redacted]	1/23/2025 7:18 PM
40	[redacted]	1/23/2025 2:01 PM
41	[redacted]	1/16/2025 5:18 AM
42	[redacted]	1/13/2025 8:28 PM
43	[redacted]	1/10/2025 6:24 PM
44	[redacted]	1/10/2025 3:37 PM
45	[redacted]	1/9/2025 10:51 PM
46	[redacted]	1/9/2025 7:35 PM
47	[redacted]	1/9/2025 12:36 PM
48	[redacted]	1/9/2025 11:53 AM
49	[redacted]	1/9/2025 9:03 AM
50	[redacted]	1/9/2025 5:28 AM
51	[redacted]	1/8/2025 7:41 PM
52	[redacted]	1/8/2025 7:33 PM
53	[redacted]	1/8/2025 7:02 PM
54	[redacted]	1/8/2025 5:01 PM
55	[redacted]	1/8/2025 1:54 PM
56	[redacted]	1/8/2025 1:08 PM
57	[redacted]	1/8/2025 12:31 PM
58	[redacted]	1/8/2025 11:58 AM
59	[redacted]	1/8/2025 11:54 AM
60	[redacted]	1/8/2025 11:17 AM
61	[redacted]	1/8/2025 11:06 AM
62	[redacted]	1/8/2025 11:02 AM
63	[redacted]	1/8/2025 10:43 AM
64	[redacted]	1/8/2025 10:35 AM
65	[redacted]	1/8/2025 10:35 AM
66	[redacted]	1/8/2025 10:06 AM
67	[redacted]	1/8/2025 10:03 AM

Appendix C: Critical Facilities

Asset Name	Asset Class
GCWA 7th Avenue Pump Station Site A	Water
GCWA 7th Avenue Pump Station Site B	Water
GCWA Administrative Office And Industrial Pumping Plant	Water
Texas City Reservoir	Water
Thomas Mackey WTP	Water
40-Acre Facility WTP	Wastewater
Blanchard Galveston Bay Refinery	Wastewater
Campbell Plant 2 Texas City	Wastewater
Central WWTF	Wastewater
Duratherm	Wastewater
Eastman Chemical Texas City Operations	Wastewater
Enterprise Products Operating Texas City	Wastewater
Galveston Bay Refinery	Wastewater
Galveston Bay RV Resort & Marina	Wastewater
Hillman Shrimp And Oyster Co.	Wastewater
Isp Technologies, Inc.	Wastewater
Marathon Petroleum Company, LLC	Wastewater

Asset Name	Asset Class
Oxbow Marine Terminal Texas City	Wastewater
San Leon WWTF	Wastewater
Sea Lion Technology	Wastewater
Sterling Pipeline	Wastewater
Texas City Crude Tank Farm	Wastewater
Texas City Plant	Wastewater
Texas City Terminal I	Wastewater
Texas City Terminal II	Wastewater
Union Carbide Corporation	Wastewater
Valero Refining - Texas, LP	Wastewater
Wallace R. Knox WWTP	Wastewater
Aspire Christian Academy	School
Blocker Middle	School
Calvary Childhood Education Ministry	School
Calvin Vincent Pre-K Head Start	School
Coastal Alternative Program	School
Dickinson J H	School
Eugene 'Gene' Kranz J H	School
Fry Int	School

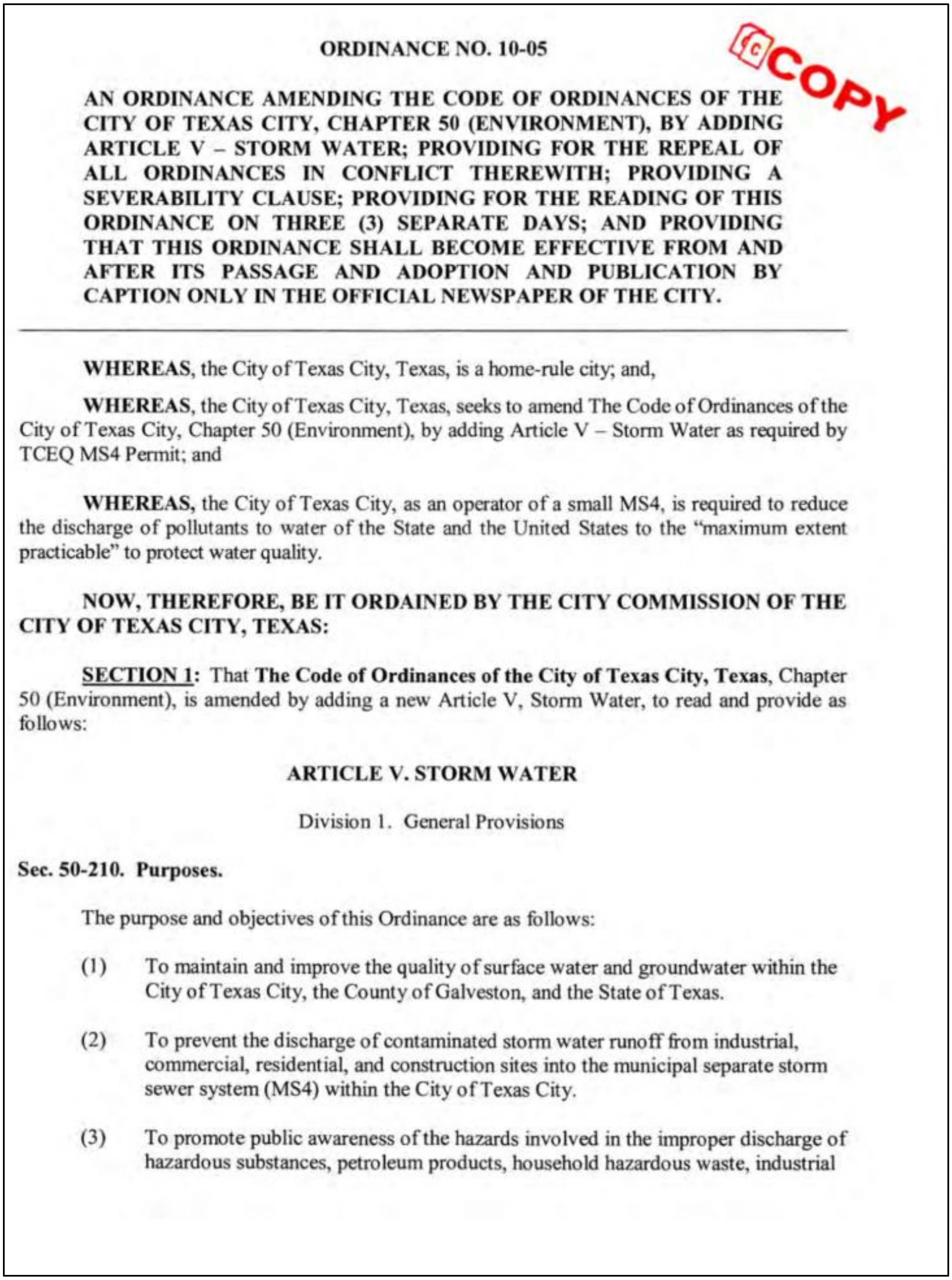
Asset Name	Asset Class
Galveston Co Detention Ctr JJAEP TLC	School
Heights El	School
Hughes Road El	School
John And Shamarion Barber Middle	School
Kohfeldt El	School
Manuel Guajardo Jr El	School
Our Lady Of Fatima Catholic School	School
R D McAdams J H	School
Roosevelt-Wilson El	School
Texas City H S	School
Woodrow Wilson DAEP	School
Texas City Fire Department Admin Building	Fire Station
Texas City Fire Station 1	Fire Station
Texas City Fire Station 2	Fire Station
Texas City Fire Station 3	Fire Station
Texas City Fire Station 4	Fire Station
College Of The Mainland	University
Ashton Parke Care Center Inc	Nursing Home
Elmcroft Of The Mainland	Nursing Home

Asset Name	Asset Class
Gambles Personal Touch Care Home	Nursing Home
Golden Years Assisted Living Facility	Nursing Home
H R A Village Inc	Nursing Home
Seabreeze Nursing And Rehabilitation	Nursing Home
Sodalis Texas City	Nursing Home
The Lakes At Texas City	Nursing Home
The Phoenix Post-Acute	Nursing Home
The Resort At Texas City	Nursing Home
The Rio At Mainland Center	Nursing Home
The Shoal	Nursing Home
College Of The Mainland Police Department	Law Enforcement
Texas City Independent School District Resource Officer	Law Enforcement
Texas City Police Department	Law Enforcement
Texas Department Of Public Safety - Highway Patrol Region 2 District A Sergeant 0 Area 6	Law Enforcement
Texas City Police Sub-Station 1	Law Enforcement
Texas City Police Sub-Station 2	Law Enforcement
A Brighter Day Quality Learning Center	Childcare Center
Calvary Childhood Education Ministry	Childcare Center
Childworks Texas City	Childcare Center

Asset Name	Asset Class
Early Learning Academy At Texas City	Childcare Center
First Class Learning Center	Childcare Center
Funtastic Friends Academy, LLC	Childcare Center
Growing Tree Learning Center	Childcare Center
Just 4 Kids	Childcare Center
Kingdom Kare CLC	Childcare Center
Raising Stars Academy	Childcare Center
Royalties Childcare	Childcare Center
St. Mary Of The Miraculous Medal Early Childhood Center	Childcare Center
Step By Step Learning Academy	Childcare Center
Texas City Martial Arts LLC	Childcare Center
Vickies Hidden Treasures	Childcare Center
Wonderland Learning Center	Childcare Center
HCA Houston Healthcare Mainland	Hospital
Gulf Coast Center	Hospital
Texas City Emergency Management Operations Center	Emergency Operations Center
Emergency Operations Center	Emergency Operations Center
Galveston County Water Industrial Reservoir Dam	Dams & Levees

Asset Name	Asset Class
GCWA Off Channel Term Stop Res Levee	Dams & Levees
Texas City – La Marque Hurricane And Flood Protection Levee	Dams & Levees
Galveston County Industrial Water Reservoir Levee System (Or “Moses Lake Levee (Texas City Rainwater Levee)”)	Dams & Levees
Gottfried Moller Pump Station ("Pump Station A")	Dams & Levees
A.B. Wolvin Pump Station ("Pump Station B")	Dams & Levees
Proposed 3rd Pump Station	Dams & Levees
Texas City Dike	Dams & Levees
City Hall	Other
Port of Texas City	Other
Gulf Coast Transit District	Other
Galveston County Long Term Recovery Group (Goltry)	Other
4b Disaster Network	Other
Sanders Center	Other
Carver Center	Other
Doyle Convention Center	Other
Texas City Maintenance Shop & Warehouse	Other

Appendix D: Floodplain Ordinance



COPY

ORDINANCE NO. 10-05

AN ORDINANCE AMENDING THE CODE OF ORDINANCES OF THE CITY OF TEXAS CITY, CHAPTER 50 (ENVIRONMENT), BY ADDING ARTICLE V – STORM WATER; PROVIDING FOR THE REPEAL OF ALL ORDINANCES IN CONFLICT THEREWITH; PROVIDING A SEVERABILITY CLAUSE; PROVIDING FOR THE READING OF THIS ORDINANCE ON THREE (3) SEPARATE DAYS; AND PROVIDING THAT THIS ORDINANCE SHALL BECOME EFFECTIVE FROM AND AFTER ITS PASSAGE AND ADOPTION AND PUBLICATION BY CAPTION ONLY IN THE OFFICIAL NEWSPAPER OF THE CITY.

WHEREAS, the City of Texas City, Texas, is a home-rule city; and,

WHEREAS, the City of Texas City, Texas, seeks to amend The Code of Ordinances of the City of Texas City, Chapter 50 (Environment), by adding Article V – Storm Water as required by TCEQ MS4 Permit; and

WHEREAS, the City of Texas City, as an operator of a small MS4, is required to reduce the discharge of pollutants to water of the State and the United States to the "maximum extent practicable" to protect water quality.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COMMISSION OF THE CITY OF TEXAS CITY, TEXAS:

SECTION 1: That **The Code of Ordinances of the City of Texas City, Texas**, Chapter 50 (Environment), is amended by adding a new Article V, Storm Water, to read and provide as follows:

ARTICLE V. STORM WATER

Division 1. General Provisions

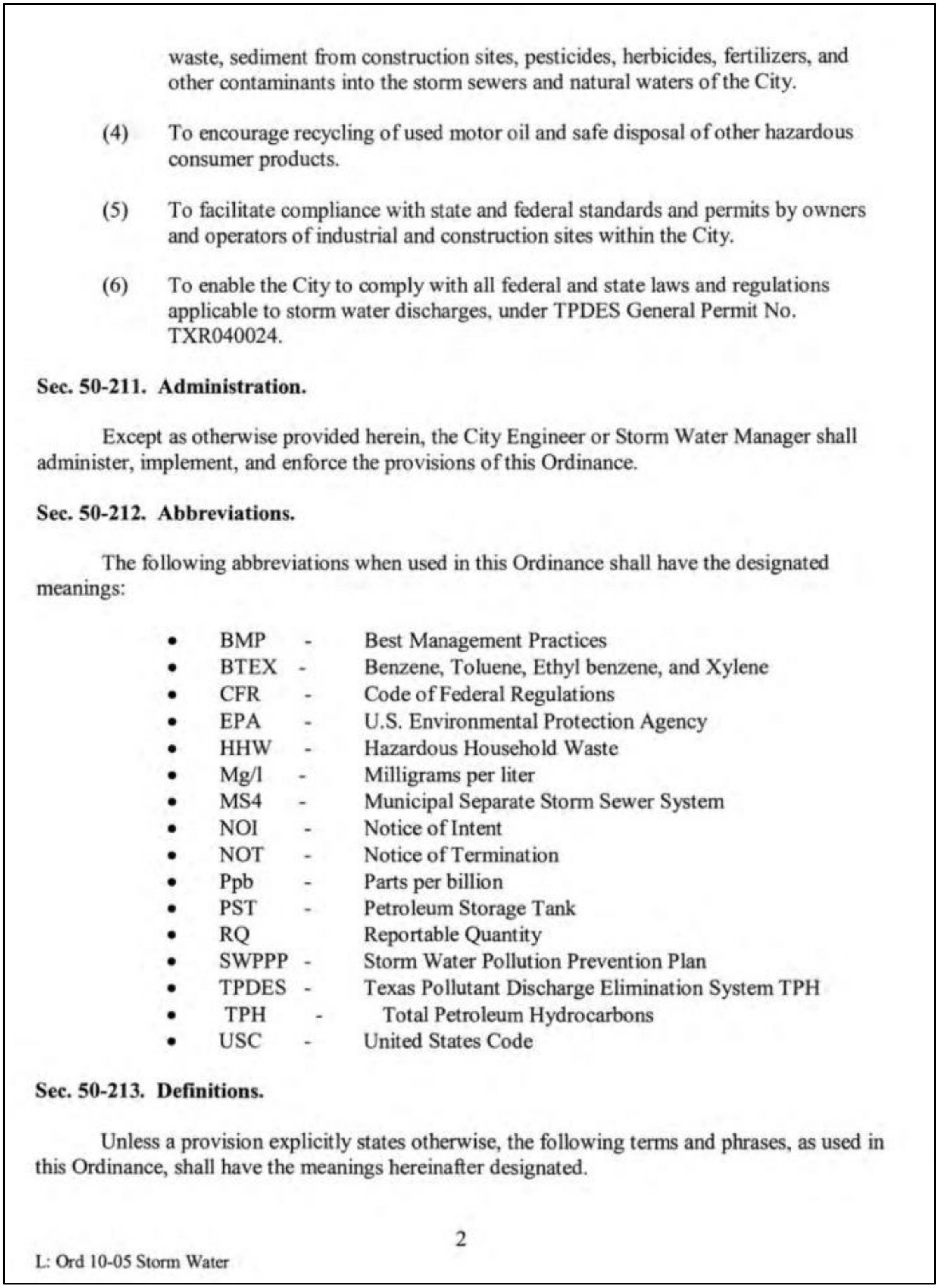
Sec. 50-210. Purposes.

The purpose and objectives of this Ordinance are as follows:

(1) To maintain and improve the quality of surface water and groundwater within the City of Texas City, the County of Galveston, and the State of Texas.

(2) To prevent the discharge of contaminated storm water runoff from industrial, commercial, residential, and construction sites into the municipal separate storm sewer system (MS4) within the City of Texas City.

(3) To promote public awareness of the hazards involved in the improper discharge of hazardous substances, petroleum products, household hazardous waste, industrial



waste, sediment from construction sites, pesticides, herbicides, fertilizers, and other contaminants into the storm sewers and natural waters of the City.

(4) To encourage recycling of used motor oil and safe disposal of other hazardous consumer products.

(5) To facilitate compliance with state and federal standards and permits by owners and operators of industrial and construction sites within the City.

(6) To enable the City to comply with all federal and state laws and regulations applicable to storm water discharges, under TPDES General Permit No. TXR040024.

Sec. 50-211. Administration.

Except as otherwise provided herein, the City Engineer or Storm Water Manager shall administer, implement, and enforce the provisions of this Ordinance.

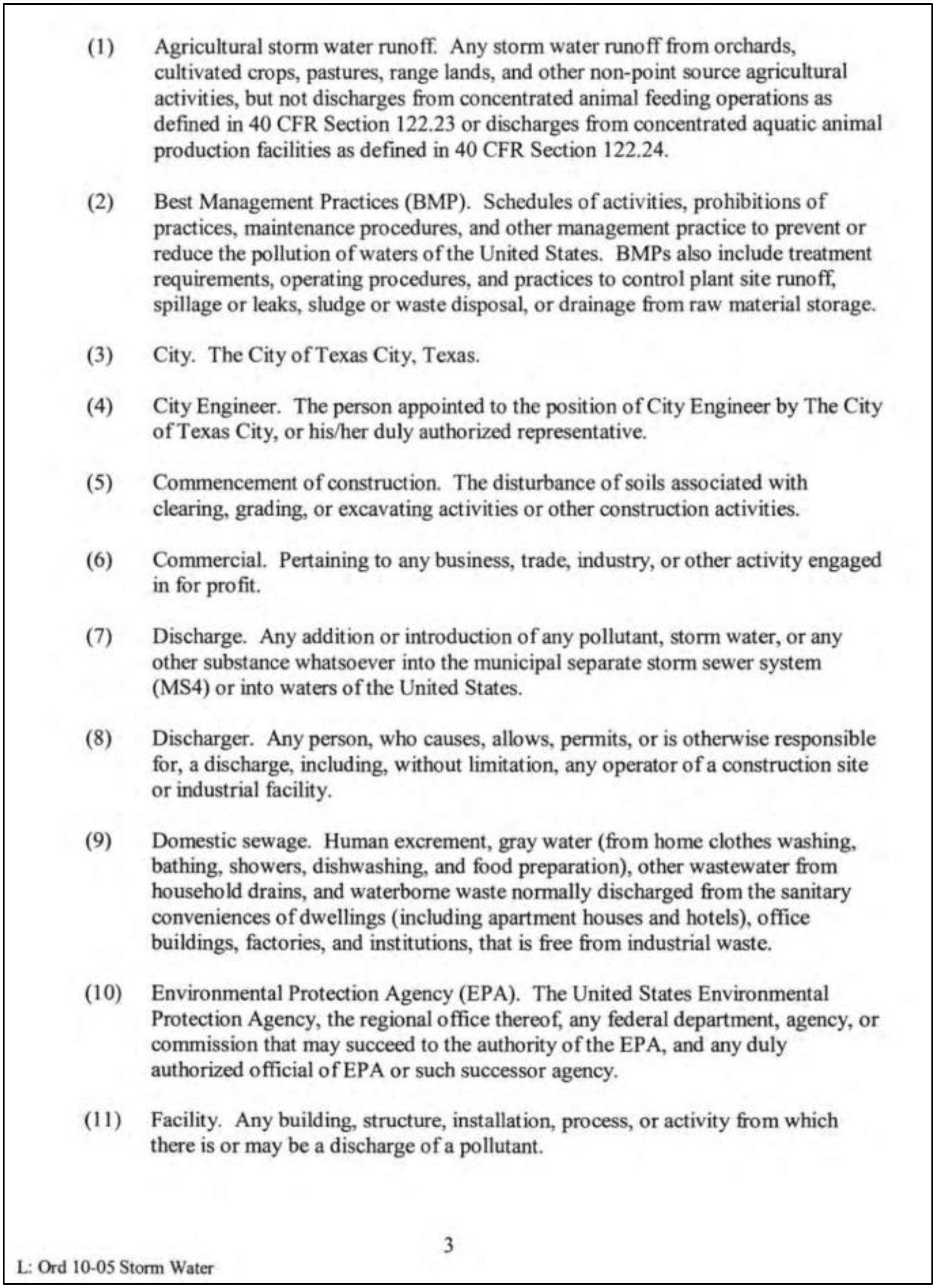
Sec. 50-212. Abbreviations.

The following abbreviations when used in this Ordinance shall have the designated meanings:

- BMP - Best Management Practices
- BTEX - Benzene, Toluene, Ethyl benzene, and Xylene
- CFR - Code of Federal Regulations
- EPA - U.S. Environmental Protection Agency
- HHW - Hazardous Household Waste
- Mg/l - Milligrams per liter
- MS4 - Municipal Separate Storm Sewer System
- NOI - Notice of Intent
- NOT - Notice of Termination
- Ppb - Parts per billion
- PST - Petroleum Storage Tank
- RQ Reportable Quantity
- SWPPP - Storm Water Pollution Prevention Plan
- TPDES - Texas Pollutant Discharge Elimination System TPH
- TPH - Total Petroleum Hydrocarbons
- USC - United States Code

Sec. 50-213. Definitions.

Unless a provision explicitly states otherwise, the following terms and phrases, as used in this Ordinance, shall have the meanings hereinafter designated.



(1) Agricultural storm water runoff. Any storm water runoff from orchards, cultivated crops, pastures, range lands, and other non-point source agricultural activities, but not discharges from concentrated animal feeding operations as defined in 40 CFR Section 122.23 or discharges from concentrated aquatic animal production facilities as defined in 40 CFR Section 122.24.

(2) Best Management Practices (BMP). Schedules of activities, prohibitions of practices, maintenance procedures, and other management practice to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

(3) City. The City of Texas City, Texas.

(4) City Engineer. The person appointed to the position of City Engineer by The City of Texas City, or his/her duly authorized representative.

(5) Commencement of construction. The disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.

(6) Commercial. Pertaining to any business, trade, industry, or other activity engaged in for profit.

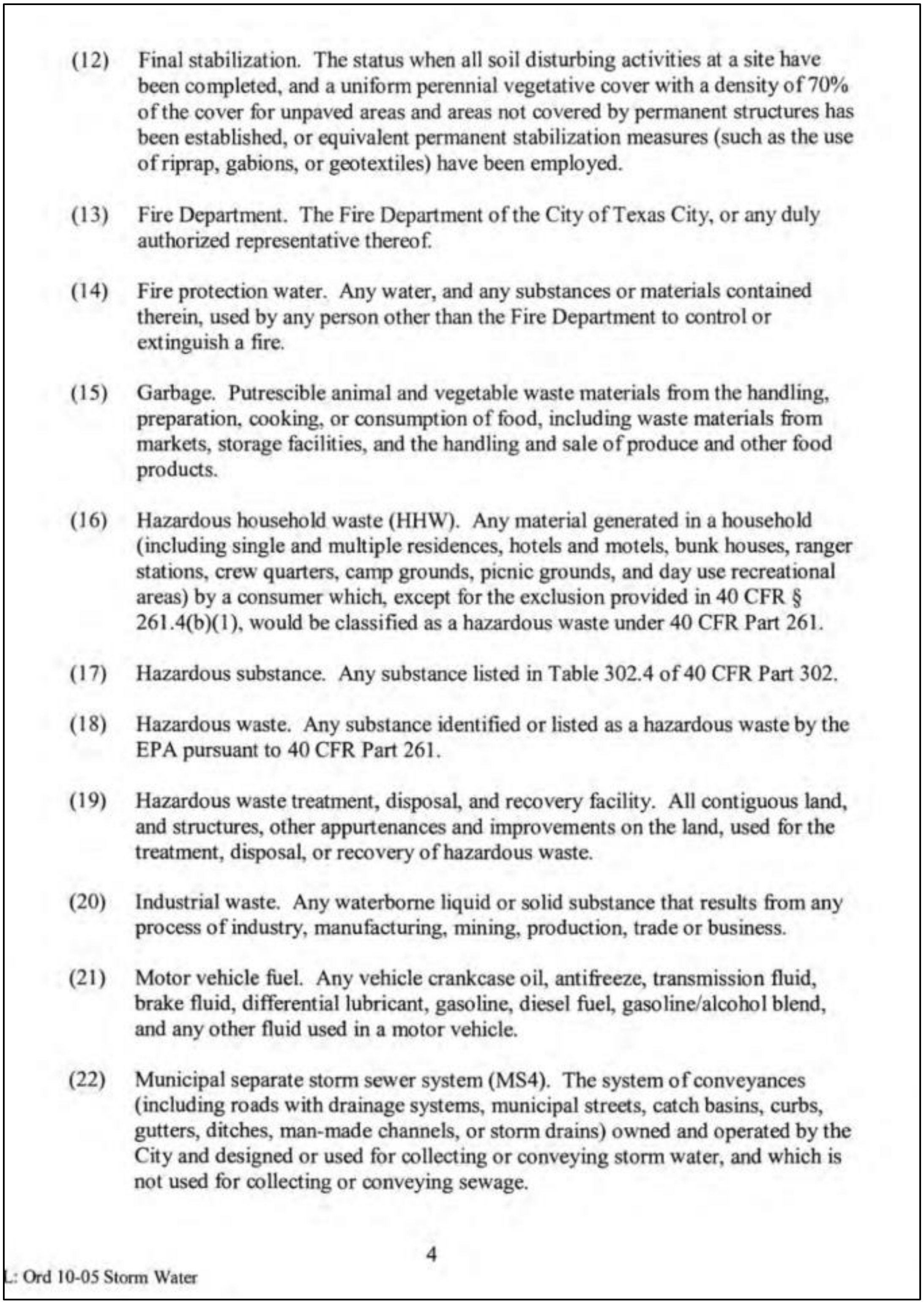
(7) Discharge. Any addition or introduction of any pollutant, storm water, or any other substance whatsoever into the municipal separate storm sewer system (MS4) or into waters of the United States.

(8) Discharger. Any person, who causes, allows, permits, or is otherwise responsible for, a discharge, including, without limitation, any operator of a construction site or industrial facility.

(9) Domestic sewage. Human excrement, gray water (from home clothes washing, bathing, showers, dishwashing, and food preparation), other wastewater from household drains, and waterborne waste normally discharged from the sanitary conveniences of dwellings (including apartment houses and hotels), office buildings, factories, and institutions, that is free from industrial waste.

(10) Environmental Protection Agency (EPA). The United States Environmental Protection Agency, the regional office thereof, any federal department, agency, or commission that may succeed to the authority of the EPA, and any duly authorized official of EPA or such successor agency.

(11) Facility. Any building, structure, installation, process, or activity from which there is or may be a discharge of a pollutant.



(12) Final stabilization. The status when all soil disturbing activities at a site have been completed, and a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

(13) Fire Department. The Fire Department of the City of Texas City, or any duly authorized representative thereof.

(14) Fire protection water. Any water, and any substances or materials contained therein, used by any person other than the Fire Department to control or extinguish a fire.

(15) Garbage. Putrescible animal and vegetable waste materials from the handling, preparation, cooking, or consumption of food, including waste materials from markets, storage facilities, and the handling and sale of produce and other food products.

(16) Hazardous household waste (HHW). Any material generated in a household (including single and multiple residences, hotels and motels, bunk houses, ranger stations, crew quarters, camp grounds, picnic grounds, and day use recreational areas) by a consumer which, except for the exclusion provided in 40 CFR § 261.4(b)(1), would be classified as a hazardous waste under 40 CFR Part 261.

(17) Hazardous substance. Any substance listed in Table 302.4 of 40 CFR Part 302.

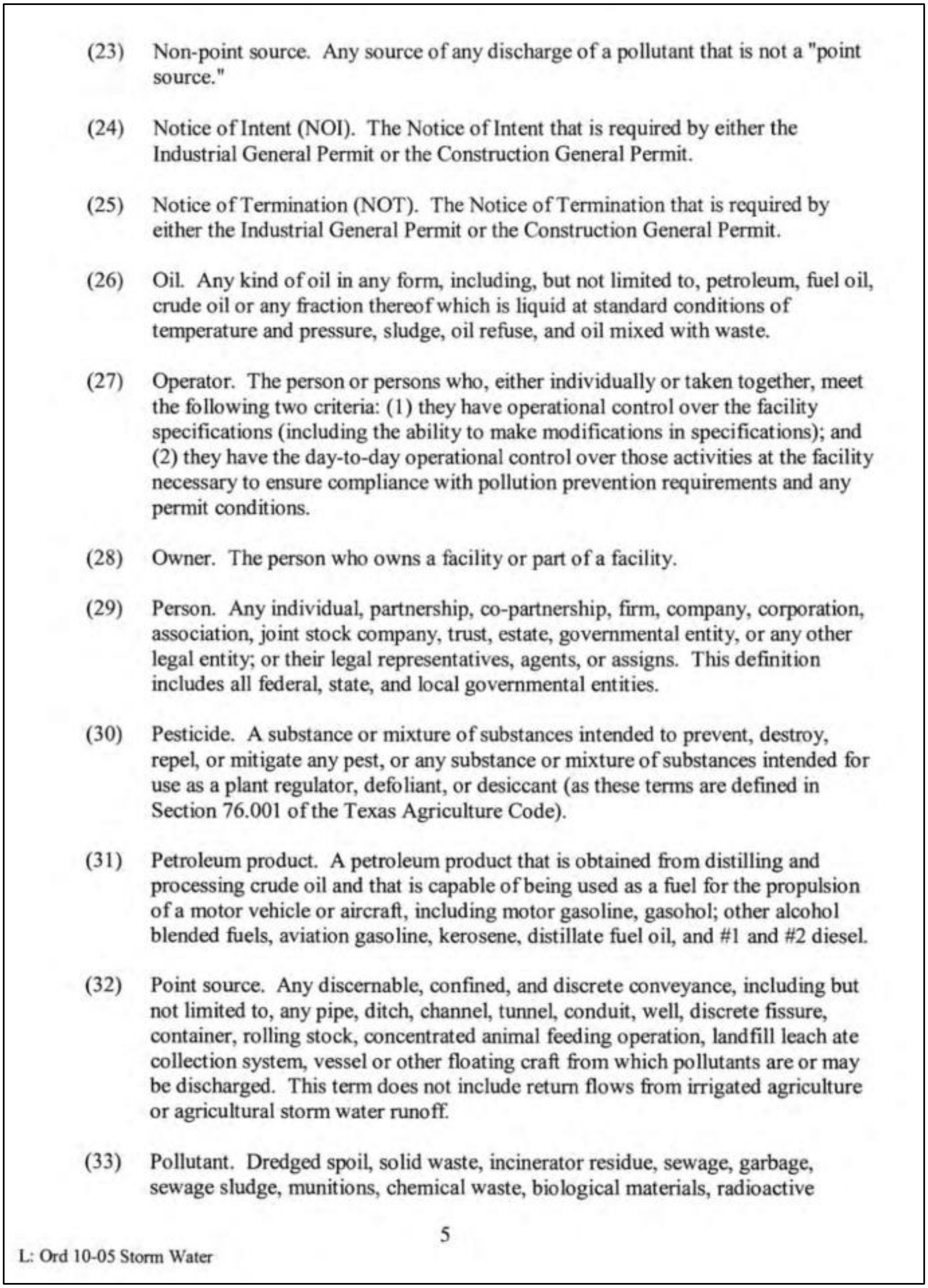
(18) Hazardous waste. Any substance identified or listed as a hazardous waste by the EPA pursuant to 40 CFR Part 261.

(19) Hazardous waste treatment, disposal, and recovery facility. All contiguous land, and structures, other appurtenances and improvements on the land, used for the treatment, disposal, or recovery of hazardous waste.

(20) Industrial waste. Any waterborne liquid or solid substance that results from any process of industry, manufacturing, mining, production, trade or business.

(21) Motor vehicle fuel. Any vehicle crankcase oil, antifreeze, transmission fluid, brake fluid, differential lubricant, gasoline, diesel fuel, gasoline/alcohol blend, and any other fluid used in a motor vehicle.

(22) Municipal separate storm sewer system (MS4). The system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) owned and operated by the City and designed or used for collecting or conveying storm water, and which is not used for collecting or conveying sewage.



(23) Non-point source. Any source of any discharge of a pollutant that is not a "point source."

(24) Notice of Intent (NOI). The Notice of Intent that is required by either the Industrial General Permit or the Construction General Permit.

(25) Notice of Termination (NOT). The Notice of Termination that is required by either the Industrial General Permit or the Construction General Permit.

(26) Oil. Any kind of oil in any form, including, but not limited to, petroleum, fuel oil, crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure, sludge, oil refuse, and oil mixed with waste.

(27) Operator. The person or persons who, either individually or taken together, meet the following two criteria: (1) they have operational control over the facility specifications (including the ability to make modifications in specifications); and (2) they have the day-to-day operational control over those activities at the facility necessary to ensure compliance with pollution prevention requirements and any permit conditions.

(28) Owner. The person who owns a facility or part of a facility.

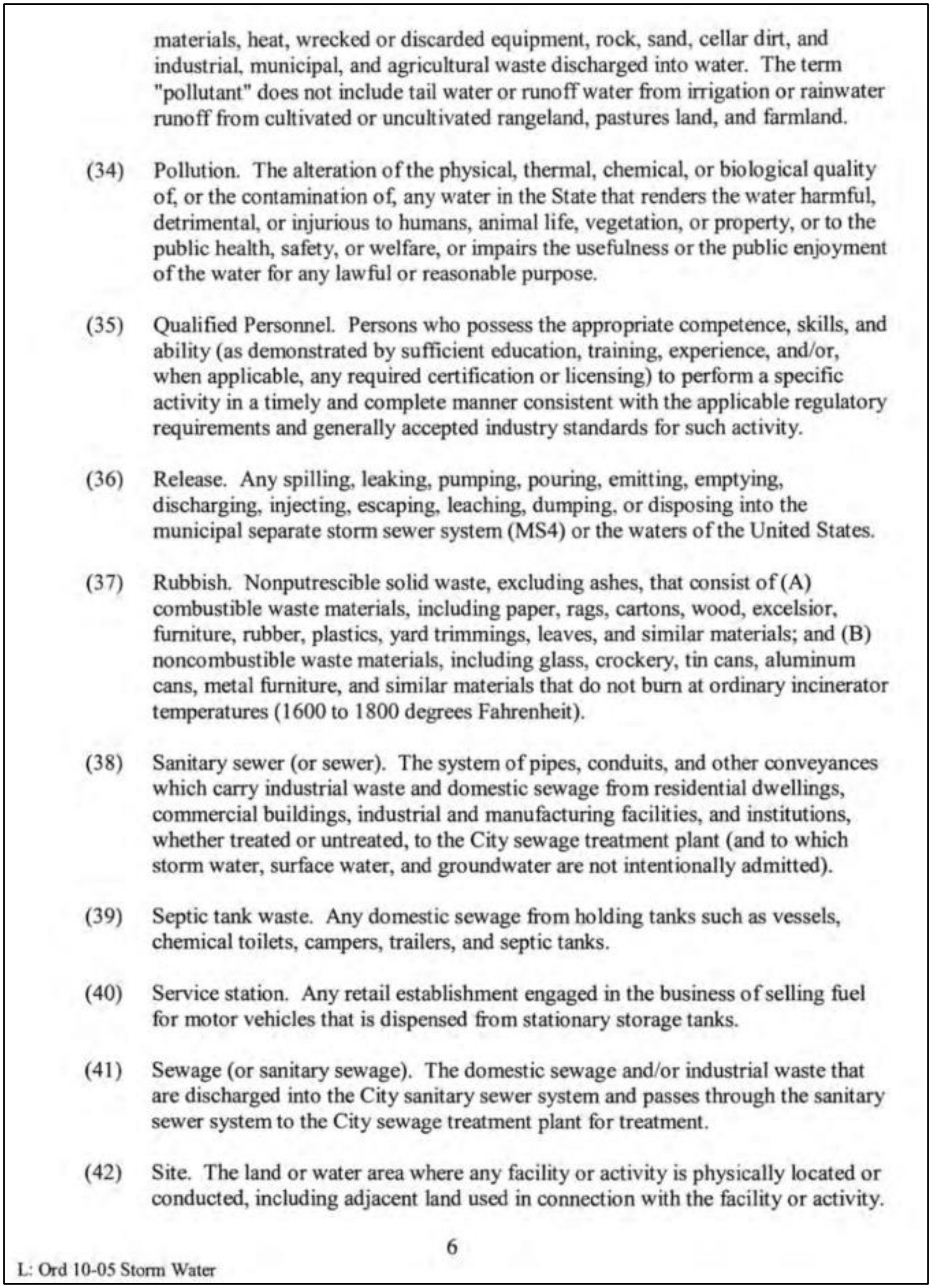
(29) Person. Any individual, partnership, co-partnership, firm, company, corporation, association, joint stock company, trust, estate, governmental entity, or any other legal entity; or their legal representatives, agents, or assigns. This definition includes all federal, state, and local governmental entities.

(30) Pesticide. A substance or mixture of substances intended to prevent, destroy, repel, or mitigate any pest, or any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant (as these terms are defined in Section 76.001 of the Texas Agriculture Code).

(31) Petroleum product. A petroleum product that is obtained from distilling and processing crude oil and that is capable of being used as a fuel for the propulsion of a motor vehicle or aircraft, including motor gasoline, gasohol; other alcohol blended fuels, aviation gasoline, kerosene, distillate fuel oil, and #1 and #2 diesel.

(32) Point source. Any discernable, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leach ate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

(33) Pollutant. Dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical waste, biological materials, radioactive



materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water. The term "pollutant" does not include tail water or runoff water from irrigation or rainwater runoff from cultivated or uncultivated rangeland, pastures land, and farmland.

(34) Pollution. The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the State that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property, or to the public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

(35) Qualified Personnel. Persons who possess the appropriate competence, skills, and ability (as demonstrated by sufficient education, training, experience, and/or, when applicable, any required certification or licensing) to perform a specific activity in a timely and complete manner consistent with the applicable regulatory requirements and generally accepted industry standards for such activity.

(36) Release. Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the municipal separate storm sewer system (MS4) or the waters of the United States.

(37) Rubbish. Nonputrescible solid waste, excluding ashes, that consist of (A) combustible waste materials, including paper, rags, cartons, wood, excelsior, furniture, rubber, plastics, yard trimmings, leaves, and similar materials; and (B) noncombustible waste materials, including glass, crockery, tin cans, aluminum cans, metal furniture, and similar materials that do not burn at ordinary incinerator temperatures (1600 to 1800 degrees Fahrenheit).

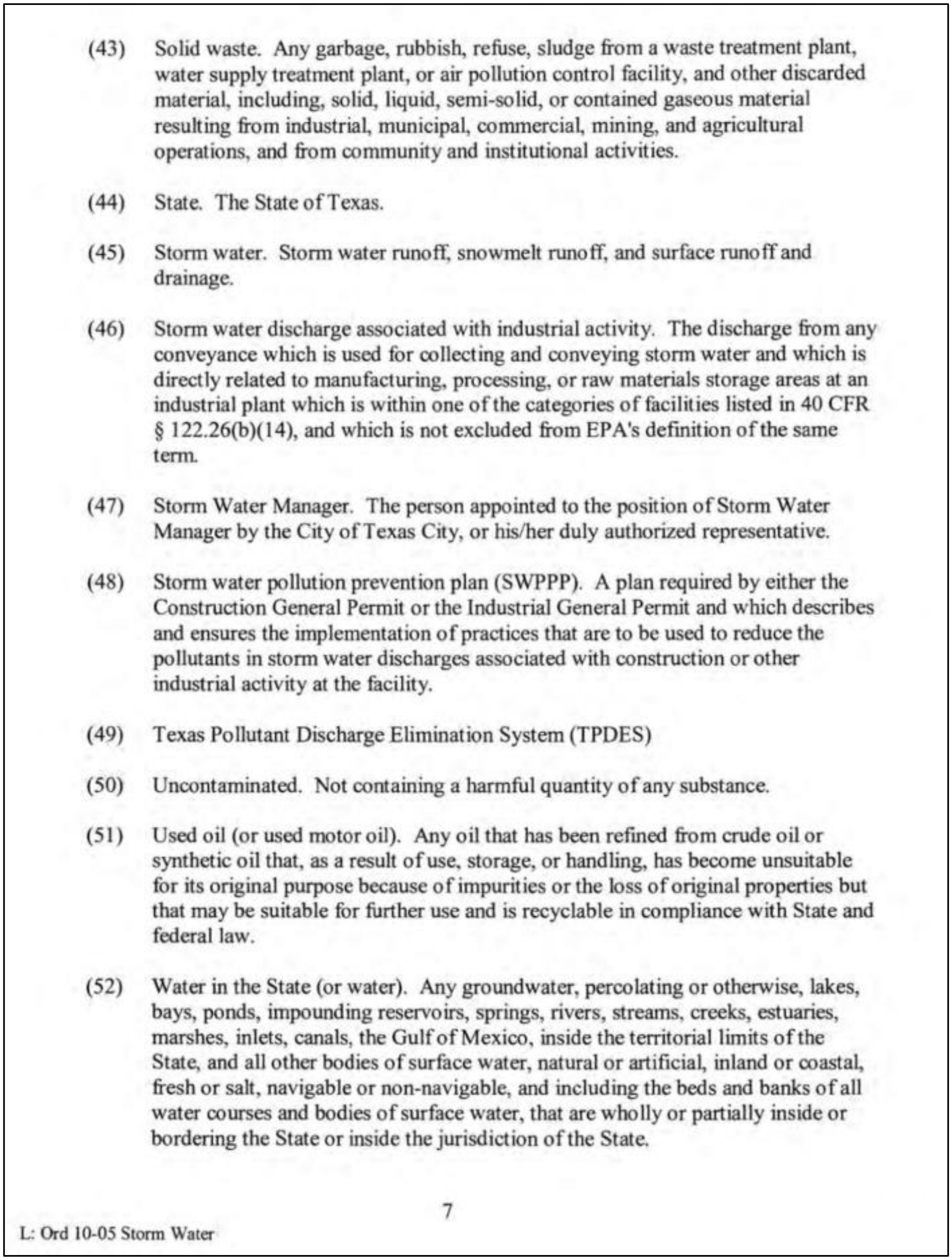
(38) Sanitary sewer (or sewer). The system of pipes, conduits, and other conveyances which carry industrial waste and domestic sewage from residential dwellings, commercial buildings, industrial and manufacturing facilities, and institutions, whether treated or untreated, to the City sewage treatment plant (and to which storm water, surface water, and groundwater are not intentionally admitted).

(39) Septic tank waste. Any domestic sewage from holding tanks such as vessels, chemical toilets, campers, trailers, and septic tanks.

(40) Service station. Any retail establishment engaged in the business of selling fuel for motor vehicles that is dispensed from stationary storage tanks.

(41) Sewage (or sanitary sewage). The domestic sewage and/or industrial waste that are discharged into the City sanitary sewer system and passes through the sanitary sewer system to the City sewage treatment plant for treatment.

(42) Site. The land or water area where any facility or activity is physically located or conducted, including adjacent land used in connection with the facility or activity.



(43) Solid waste. Any garbage, rubbish, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including, solid, liquid, semi-solid, or contained gaseous material resulting from industrial, municipal, commercial, mining, and agricultural operations, and from community and institutional activities.

(44) State. The State of Texas.

(45) Storm water. Storm water runoff, snowmelt runoff, and surface runoff and drainage.

(46) Storm water discharge associated with industrial activity. The discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant which is within one of the categories of facilities listed in 40 CFR § 122.26(b)(14), and which is not excluded from EPA's definition of the same term.

(47) Storm Water Manager. The person appointed to the position of Storm Water Manager by the City of Texas City, or his/her duly authorized representative.

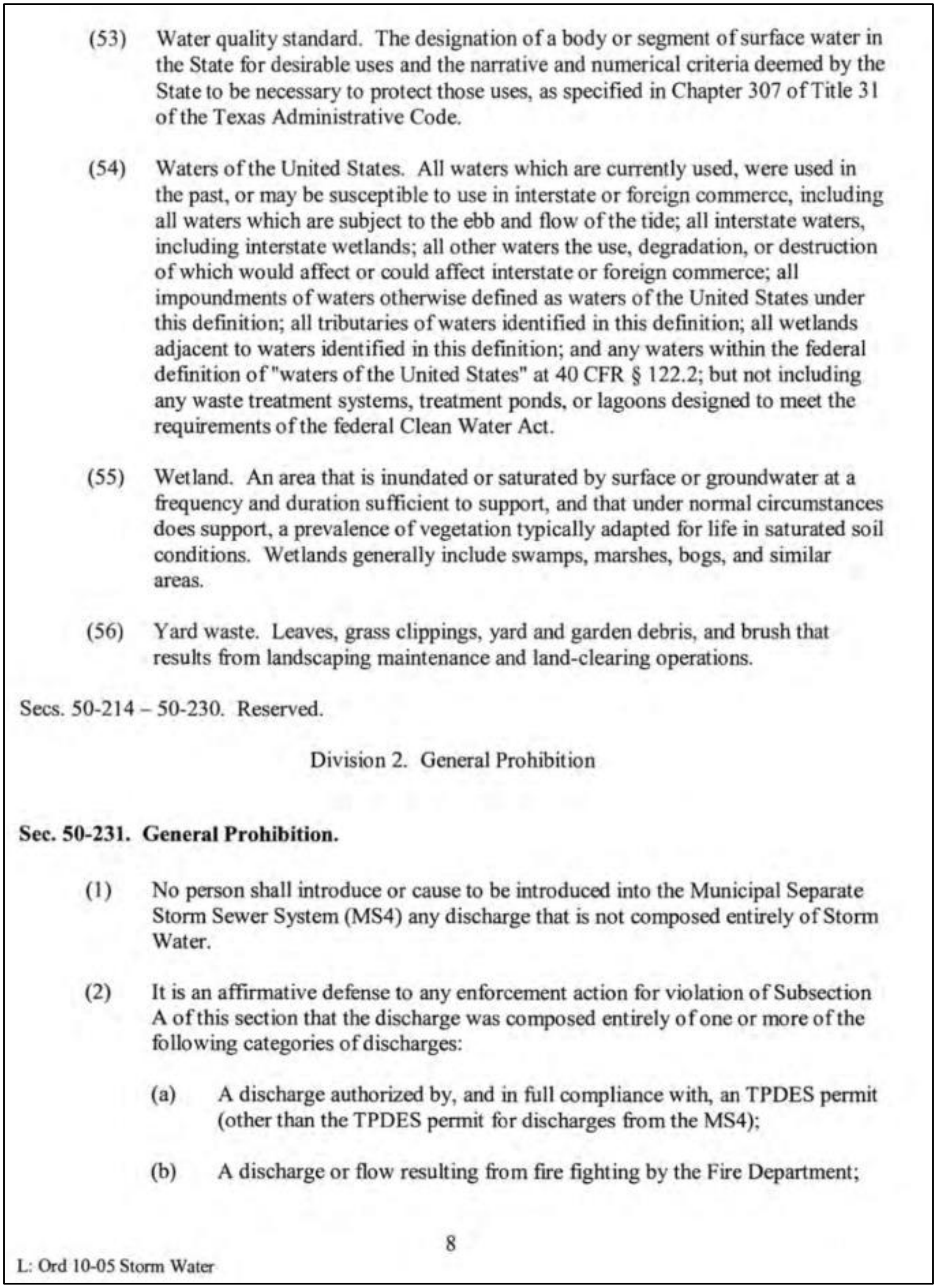
(48) Storm water pollution prevention plan (SWPPP). A plan required by either the Construction General Permit or the Industrial General Permit and which describes and ensures the implementation of practices that are to be used to reduce the pollutants in storm water discharges associated with construction or other industrial activity at the facility.

(49) Texas Pollutant Discharge Elimination System (TPDES)

(50) Uncontaminated. Not containing a harmful quantity of any substance.

(51) Used oil (or used motor oil). Any oil that has been refined from crude oil or synthetic oil that, as a result of use, storage, or handling, has become unsuitable for its original purpose because of impurities or the loss of original properties but that may be suitable for further use and is recyclable in compliance with State and federal law.

(52) Water in the State (or water). Any groundwater, percolating or otherwise, lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Gulf of Mexico, inside the territorial limits of the State, and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or non-navigable, and including the beds and banks of all water courses and bodies of surface water, that are wholly or partially inside or bordering the State or inside the jurisdiction of the State.



(53) Water quality standard. The designation of a body or segment of surface water in the State for desirable uses and the narrative and numerical criteria deemed by the State to be necessary to protect those uses, as specified in Chapter 307 of Title 31 of the Texas Administrative Code.

(54) Waters of the United States. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; all interstate waters, including interstate wetlands; all other waters the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce; all impoundments of waters otherwise defined as waters of the United States under this definition; all tributaries of waters identified in this definition; all wetlands adjacent to waters identified in this definition; and any waters within the federal definition of "waters of the United States" at 40 CFR § 122.2; but not including any waste treatment systems, treatment ponds, or lagoons designed to meet the requirements of the federal Clean Water Act.

(55) Wetland. An area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

(56) Yard waste. Leaves, grass clippings, yard and garden debris, and brush that results from landscaping maintenance and land-clearing operations.

Secs. 50-214 – 50-230. Reserved.

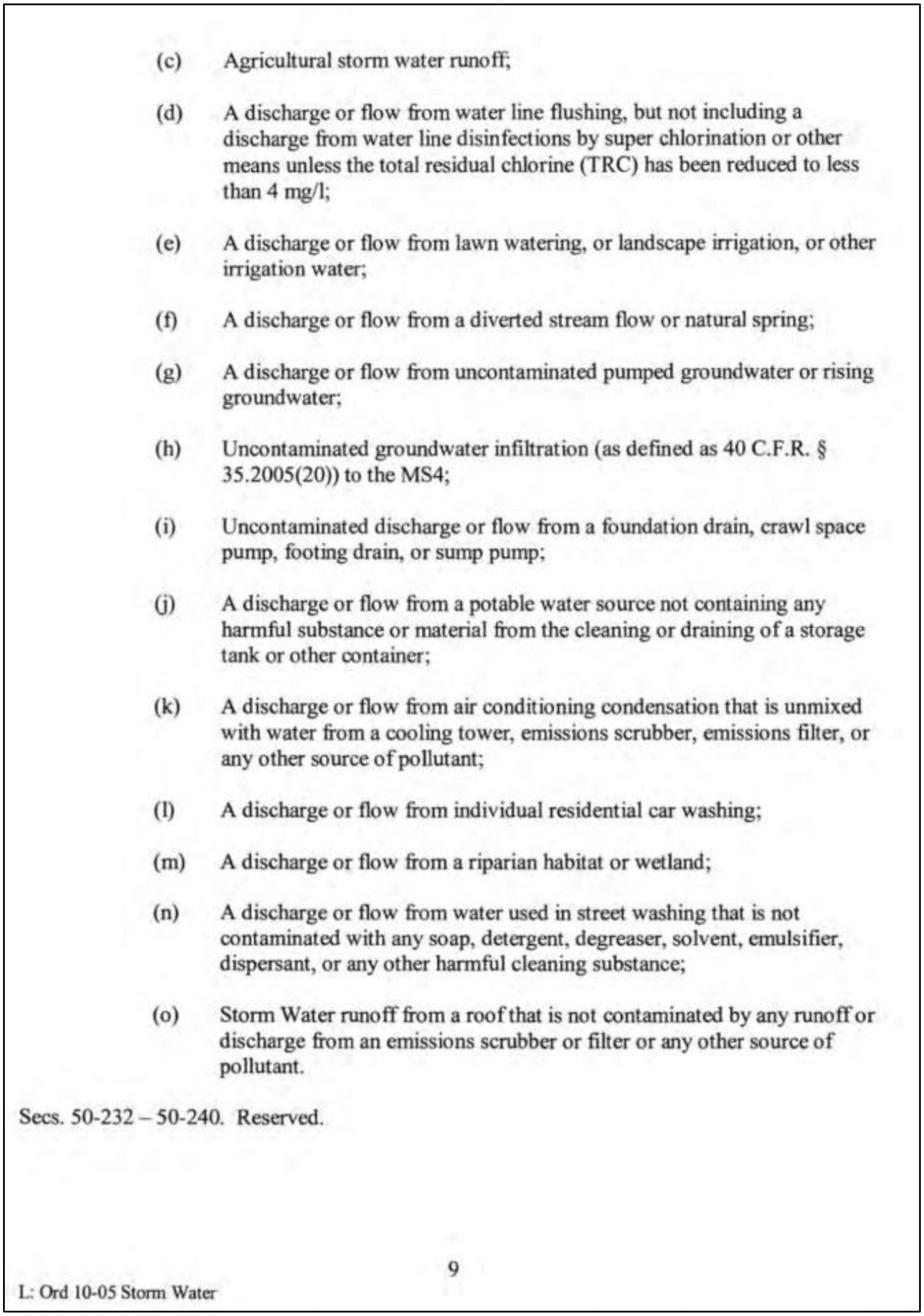
Division 2. General Prohibition

Sec. 50-231. General Prohibition.

(1) No person shall introduce or cause to be introduced into the Municipal Separate Storm Sewer System (MS4) any discharge that is not composed entirely of Storm Water.

(2) It is an affirmative defense to any enforcement action for violation of Subsection A of this section that the discharge was composed entirely of one or more of the following categories of discharges:

- (a) A discharge authorized by, and in full compliance with, an TPDES permit (other than the TPDES permit for discharges from the MS4);
- (b) A discharge or flow resulting from fire fighting by the Fire Department;



(c) Agricultural storm water runoff;

(d) A discharge or flow from water line flushing, but not including a discharge from water line disinfections by super chlorination or other means unless the total residual chlorine (TRC) has been reduced to less than 4 mg/l;

(e) A discharge or flow from lawn watering, or landscape irrigation, or other irrigation water;

(f) A discharge or flow from a diverted stream flow or natural spring;

(g) A discharge or flow from uncontaminated pumped groundwater or rising groundwater;

(h) Uncontaminated groundwater infiltration (as defined as 40 C.F.R. § 35.2005(20)) to the MS4;

(i) Uncontaminated discharge or flow from a foundation drain, crawl space pump, footing drain, or sump pump;

(j) A discharge or flow from a potable water source not containing any harmful substance or material from the cleaning or draining of a storage tank or other container;

(k) A discharge or flow from air conditioning condensation that is unmixed with water from a cooling tower, emissions scrubber, emissions filter, or any other source of pollutant;

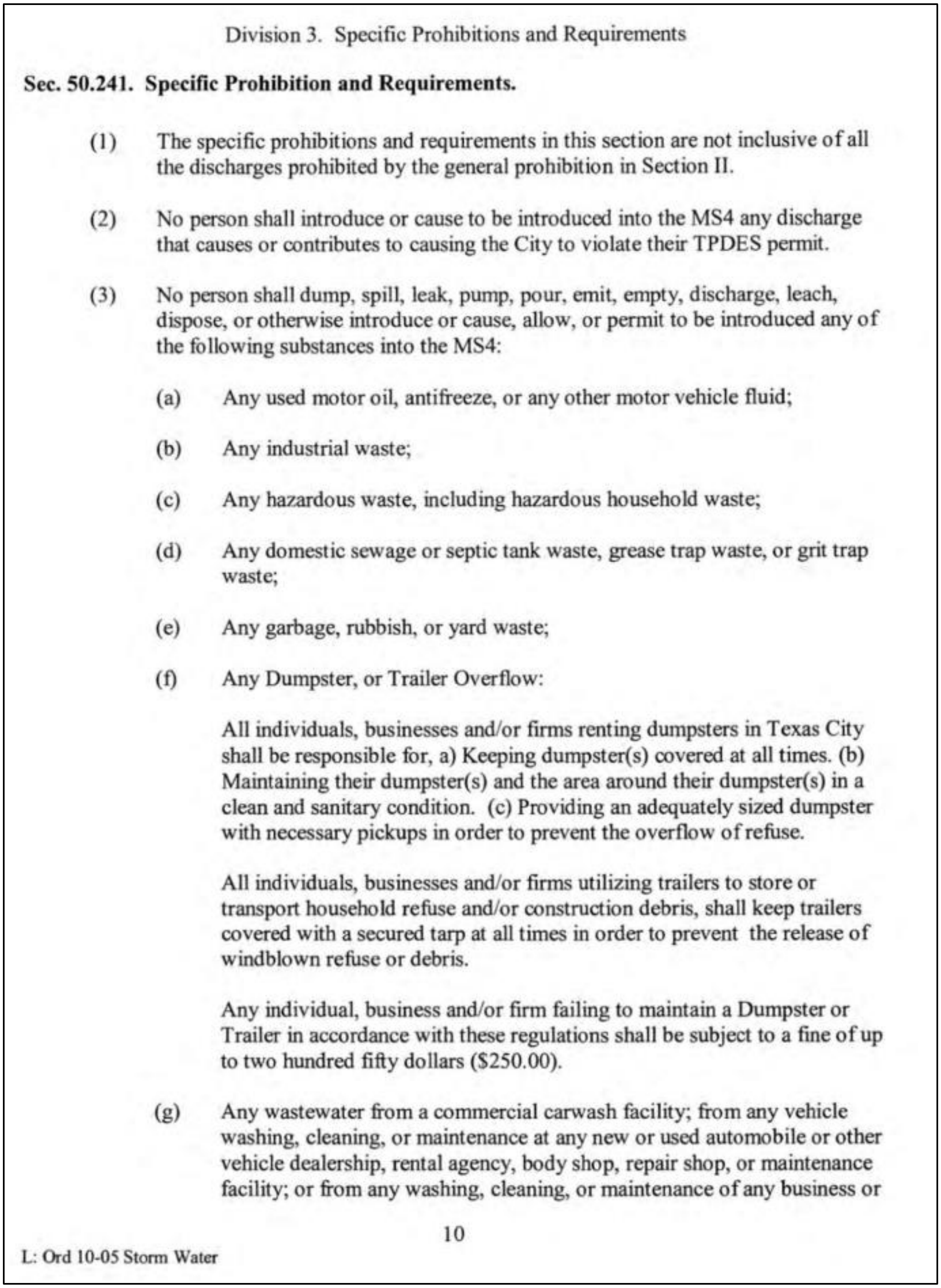
(l) A discharge or flow from individual residential car washing;

(m) A discharge or flow from a riparian habitat or wetland;

(n) A discharge or flow from water used in street washing that is not contaminated with any soap, detergent, degreaser, solvent, emulsifier, dispersant, or any other harmful cleaning substance;

(o) Storm Water runoff from a roof that is not contaminated by any runoff or discharge from an emissions scrubber or filter or any other source of pollutant.

Secs. 50-232 – 50-240. Reserved.



Division 3. Specific Prohibitions and Requirements

Sec. 50.241. Specific Prohibition and Requirements.

(1) The specific prohibitions and requirements in this section are not inclusive of all the discharges prohibited by the general prohibition in Section II.

(2) No person shall introduce or cause to be introduced into the MS4 any discharge that causes or contributes to causing the City to violate their TPDES permit.

(3) No person shall dump, spill, leak, pump, pour, emit, empty, discharge, leach, dispose, or otherwise introduce or cause, allow, or permit to be introduced any of the following substances into the MS4:

(a) Any used motor oil, antifreeze, or any other motor vehicle fluid;

(b) Any industrial waste;

(c) Any hazardous waste, including hazardous household waste;

(d) Any domestic sewage or septic tank waste, grease trap waste, or grit trap waste;

(e) Any garbage, rubbish, or yard waste;

(f) Any Dumpster, or Trailer Overflow:

All individuals, businesses and/or firms renting dumpsters in Texas City shall be responsible for, a) Keeping dumpster(s) covered at all times. (b) Maintaining their dumpster(s) and the area around their dumpster(s) in a clean and sanitary condition. (c) Providing an adequately sized dumpster with necessary pickups in order to prevent the overflow of refuse.

All individuals, businesses and/or firms utilizing trailers to store or transport household refuse and/or construction debris, shall keep trailers covered with a secured tarp at all times in order to prevent the release of windblown refuse or debris.

Any individual, business and/or firm failing to maintain a Dumpster or Trailer in accordance with these regulations shall be subject to a fine of up to two hundred fifty dollars ($250.00).

(g) Any wastewater from a commercial carwash facility; from any vehicle washing, cleaning, or maintenance at any new or used automobile or other vehicle dealership, rental agency, body shop, repair shop, or maintenance facility; or from any washing, cleaning, or maintenance of any business or commercial or public service vehicle, including a truck, bus, or heavy equipment;

(h) Any wastewater from a commercial mobile power washer or from the washing or other cleaning of a building exterior that contains any soap, detergent, degreaser, solvent, or any other harmful cleaning substance;

(i) Any wastewater from commercial floor, rug, or carpet cleaning;

(j) Any wastewater from the wash down or other cleaning of pavement that contains any harmful quantity of soap, detergent, solvent, degreaser, emulsifier, dispersant, or any other harmful cleaning substance; or any wastewater from the wash down or other cleaning of any pavement where any spill, leak, or other release of oil, motor fuel, or other petroleum or hazardous substance has occurred, unless all harmful quantities of such released material have been previously removed;

(k) Any effluent from a cooling tower, condenser, compressor, emissions scrubber, emissions filter, or the blow down from a boiler;

(l) Any ready-mixed concrete, mortar, ceramic, or asphalt base material or hydro mulch material, or from the cleaning of vehicles or equipment containing, or used in transporting or applying, such material;

(m) Any filter backwash from a swimming pool, fountain, or spa;

(n) Any water from a water curtain in a spray room used for painting vehicles or equipment;

(o) Any contaminated runoff from a vehicle wrecking yard;

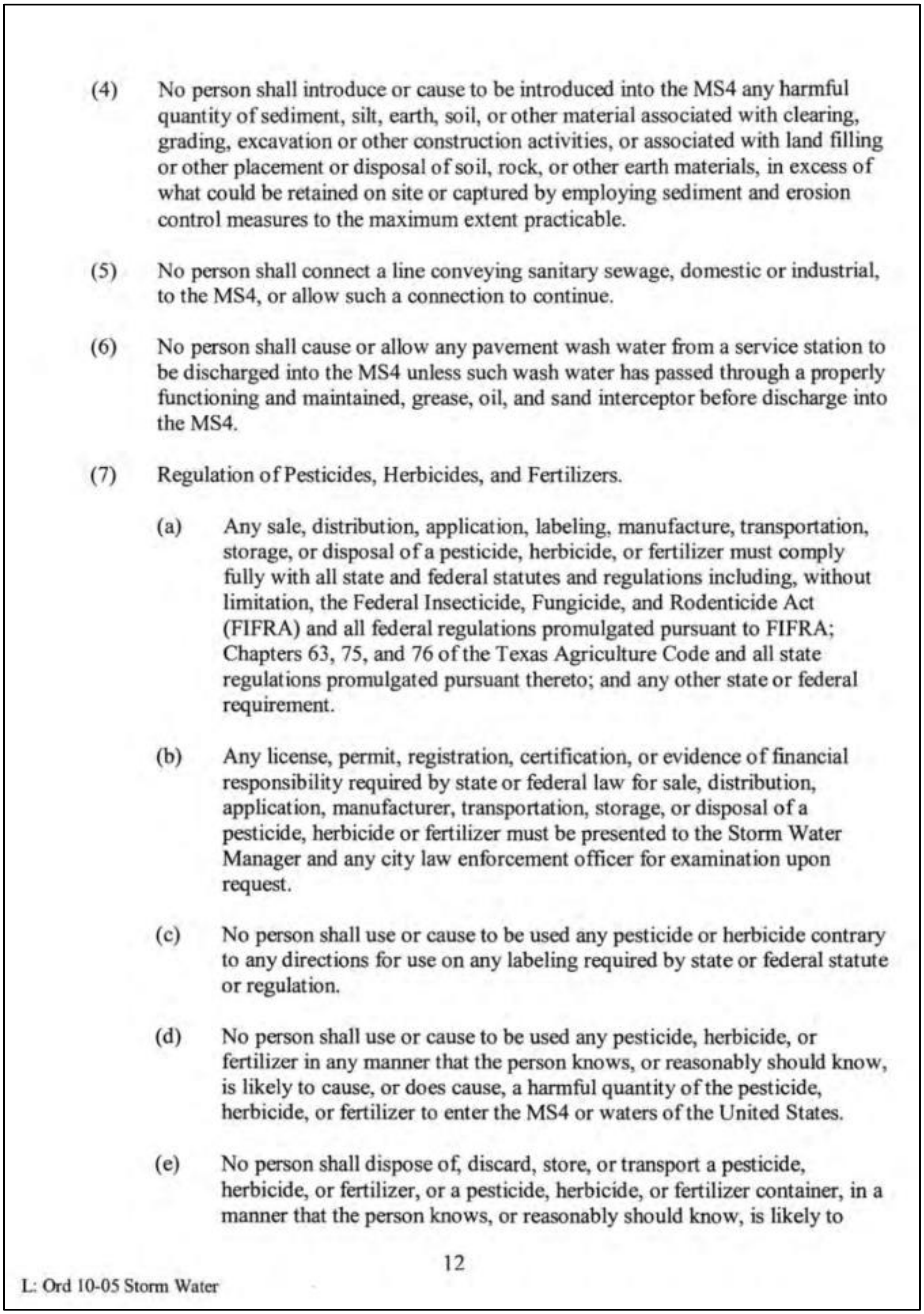
(p) Any substance or material that will damage, block, or clog the MS4;

(q) Any release from a petroleum storage tank (PST), or any leach ate or runoff from soil contaminated by a leaking PST, or any discharge of pumped, confined, or treated wastewater from the remediation of any such PST release, unless the discharge satisfies all of the following criteria:

  (i) Compliance with all state and federal standards and requirements;

  (ii) No discharge containing a harmful quantity of any pollutant;

  (iii) No discharge containing more than 50 parts per billion of benzene; 500 parts per billion combined total quantities of benzene, toluene, methylbenzene, and xylem (BTEX); or 15 mg/l of total petroleum hydrocarbons (TPH).



(4) No person shall introduce or cause to be introduced into the MS4 any harmful quantity of sediment, silt, earth, soil, or other material associated with clearing, grading, excavation or other construction activities, or associated with land filling or other placement or disposal of soil, rock, or other earth materials, in excess of what could be retained on site or captured by employing sediment and erosion control measures to the maximum extent practicable.

(5) No person shall connect a line conveying sanitary sewage, domestic or industrial, to the MS4, or allow such a connection to continue.

(6) No person shall cause or allow any pavement wash water from a service station to be discharged into the MS4 unless such wash water has passed through a properly functioning and maintained, grease, oil, and sand interceptor before discharge into the MS4.

(7) Regulation of Pesticides, Herbicides, and Fertilizers.

(a) Any sale, distribution, application, labeling, manufacture, transportation, storage, or disposal of a pesticide, herbicide, or fertilizer must comply fully with all state and federal statutes and regulations including, without limitation, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and all federal regulations promulgated pursuant to FIFRA; Chapters 63, 75, and 76 of the Texas Agriculture Code and all state regulations promulgated pursuant thereto; and any other state or federal requirement.

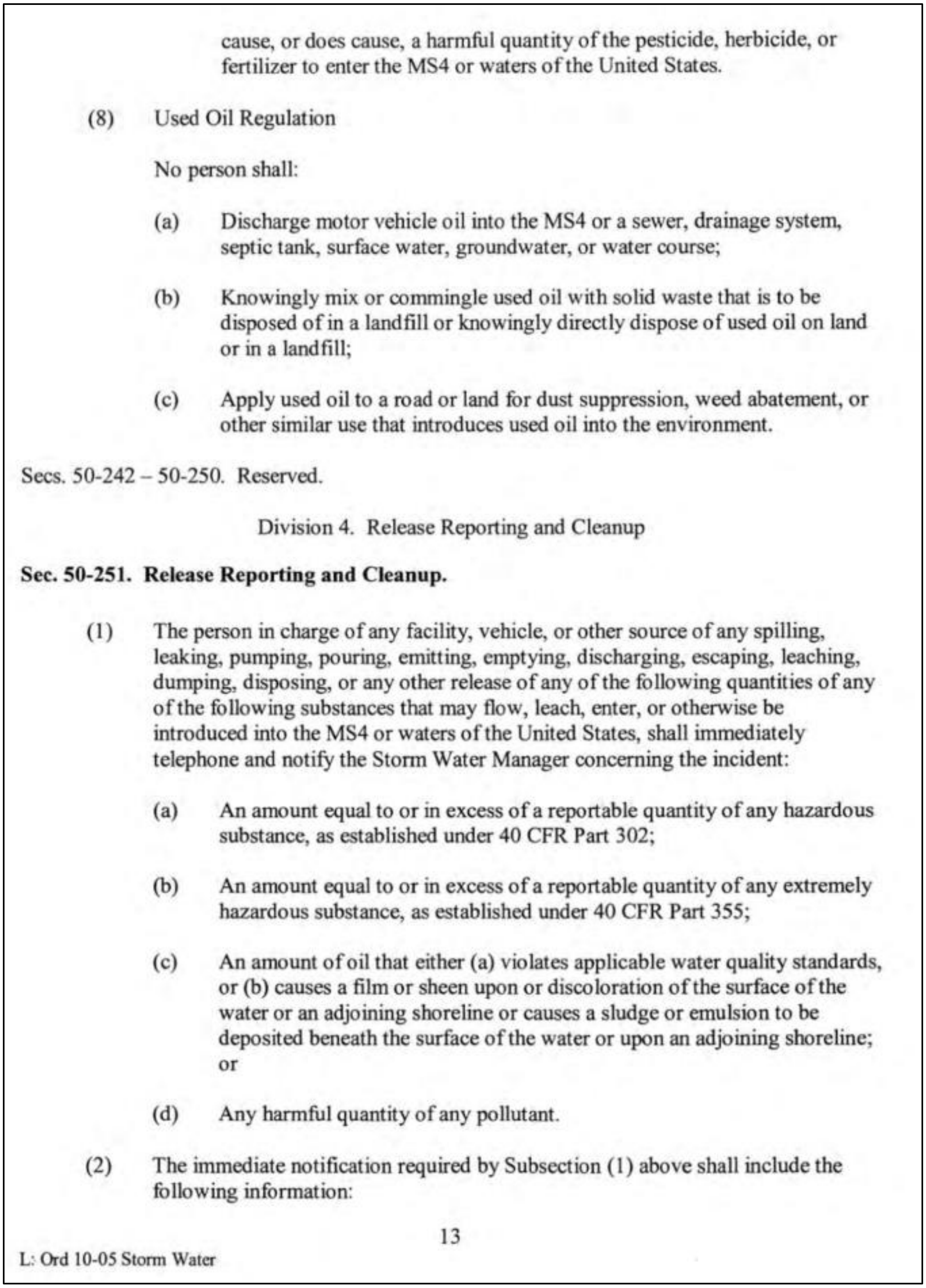
(b) Any license, permit, registration, certification, or evidence of financial responsibility required by state or federal law for sale, distribution, application, manufacturer, transportation, storage, or disposal of a pesticide, herbicide or fertilizer must be presented to the Storm Water Manager and any city law enforcement officer for examination upon request.

(c) No person shall use or cause to be used any pesticide or herbicide contrary to any directions for use on any labeling required by state or federal statute or regulation.

(d) No person shall use or cause to be used any pesticide, herbicide, or fertilizer in any manner that the person knows, or reasonably should know, is likely to cause, or does cause, a harmful quantity of the pesticide, herbicide, or fertilizer to enter the MS4 or waters of the United States.

(e) No person shall dispose of, discard, store, or transport a pesticide, herbicide, or fertilizer, or a pesticide, herbicide, or fertilizer container, in a manner that the person knows, or reasonably should know, is likely to

Floodplain Ordinance (continued)



cause, or does cause, a harmful quantity of the pesticide, herbicide, or fertilizer to enter the MS4 or waters of the United States.

(8) Used Oil Regulation

No person shall:

(a) Discharge motor vehicle oil into the MS4 or a sewer, drainage system, septic tank, surface water, groundwater, or water course;

(b) Knowingly mix or commingle used oil with solid waste that is to be disposed of in a landfill or knowingly directly dispose of used oil on land or in a landfill;

(c) Apply used oil to a road or land for dust suppression, weed abatement, or other similar use that introduces used oil into the environment.

Secs. 50-242 – 50-250. Reserved.

Division 4. Release Reporting and Cleanup

Sec. 50-251. Release Reporting and Cleanup.

(1) The person in charge of any facility, vehicle, or other source of any spilling, leaking, pumping, pouring, emitting, emptying, discharging, escaping, leaching, dumping, disposing, or any other release of any of the following quantities of any of the following substances that may flow, leach, enter, or otherwise be introduced into the MS4 or waters of the United States, shall immediately telephone and notify the Storm Water Manager concerning the incident:

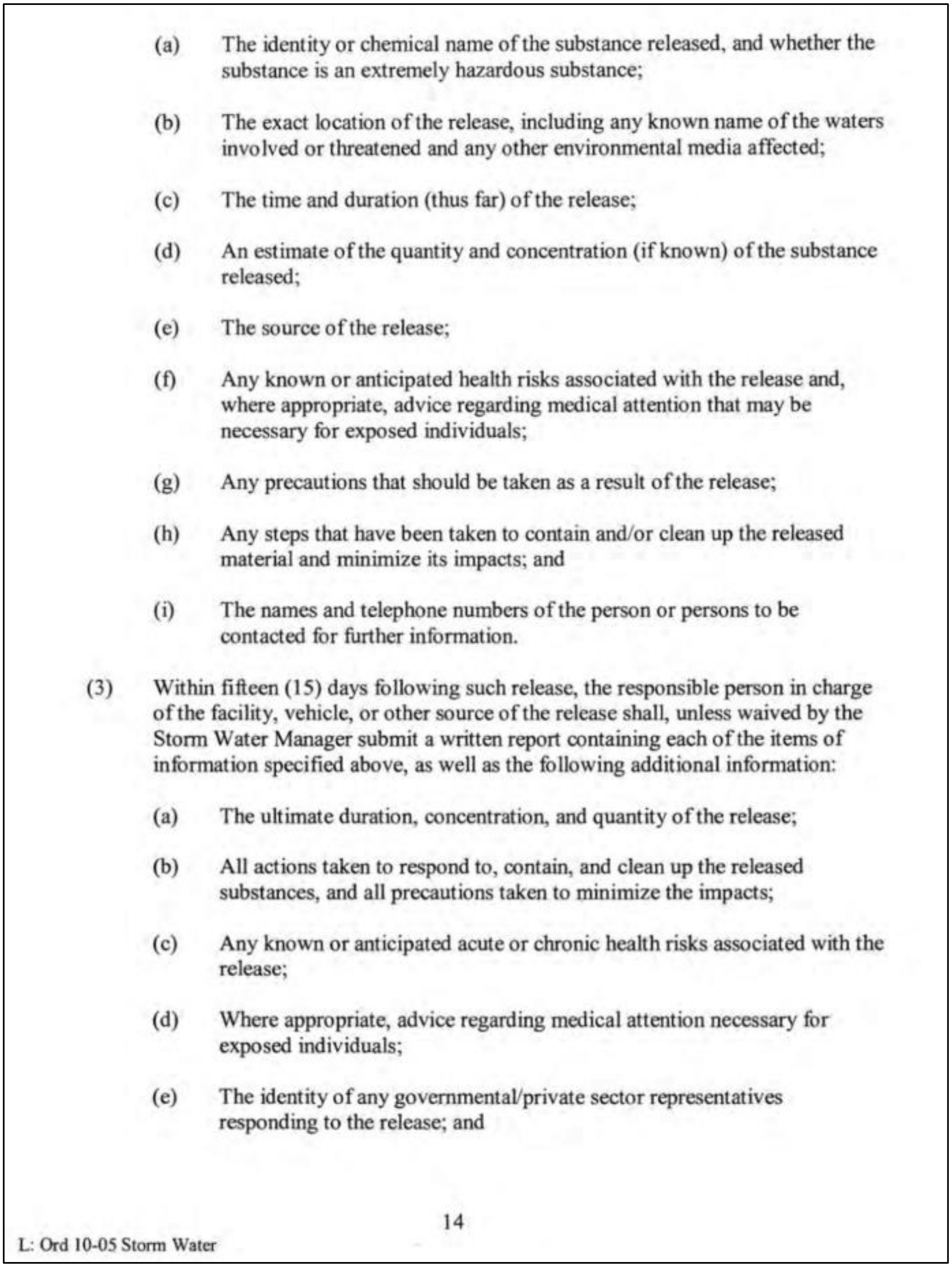
(a) An amount equal to or in excess of a reportable quantity of any hazardous substance, as established under 40 CFR Part 302;

(b) An amount equal to or in excess of a reportable quantity of any extremely hazardous substance, as established under 40 CFR Part 355;

(c) An amount of oil that either (a) violates applicable water quality standards, or (b) causes a film or sheen upon or discoloration of the surface of the water or an adjoining shoreline or causes a sludge or emulsion to be deposited beneath the surface of the water or upon an adjoining shoreline; or

(d) Any harmful quantity of any pollutant.

(2) The immediate notification required by Subsection (1) above shall include the following information:



(a) The identity or chemical name of the substance released, and whether the substance is an extremely hazardous substance;

(b) The exact location of the release, including any known name of the waters involved or threatened and any other environmental media affected;

(c) The time and duration (thus far) of the release;

(d) An estimate of the quantity and concentration (if known) of the substance released;

(e) The source of the release;

(f) Any known or anticipated health risks associated with the release and, where appropriate, advice regarding medical attention that may be necessary for exposed individuals;

(g) Any precautions that should be taken as a result of the release;

(h) Any steps that have been taken to contain and/or clean up the released material and minimize its impacts; and

(i) The names and telephone numbers of the person or persons to be contacted for further information.

(3) Within fifteen (15) days following such release, the responsible person in charge of the facility, vehicle, or other source of the release shall, unless waived by the Storm Water Manager submit a written report containing each of the items of information specified above, as well as the following additional information:

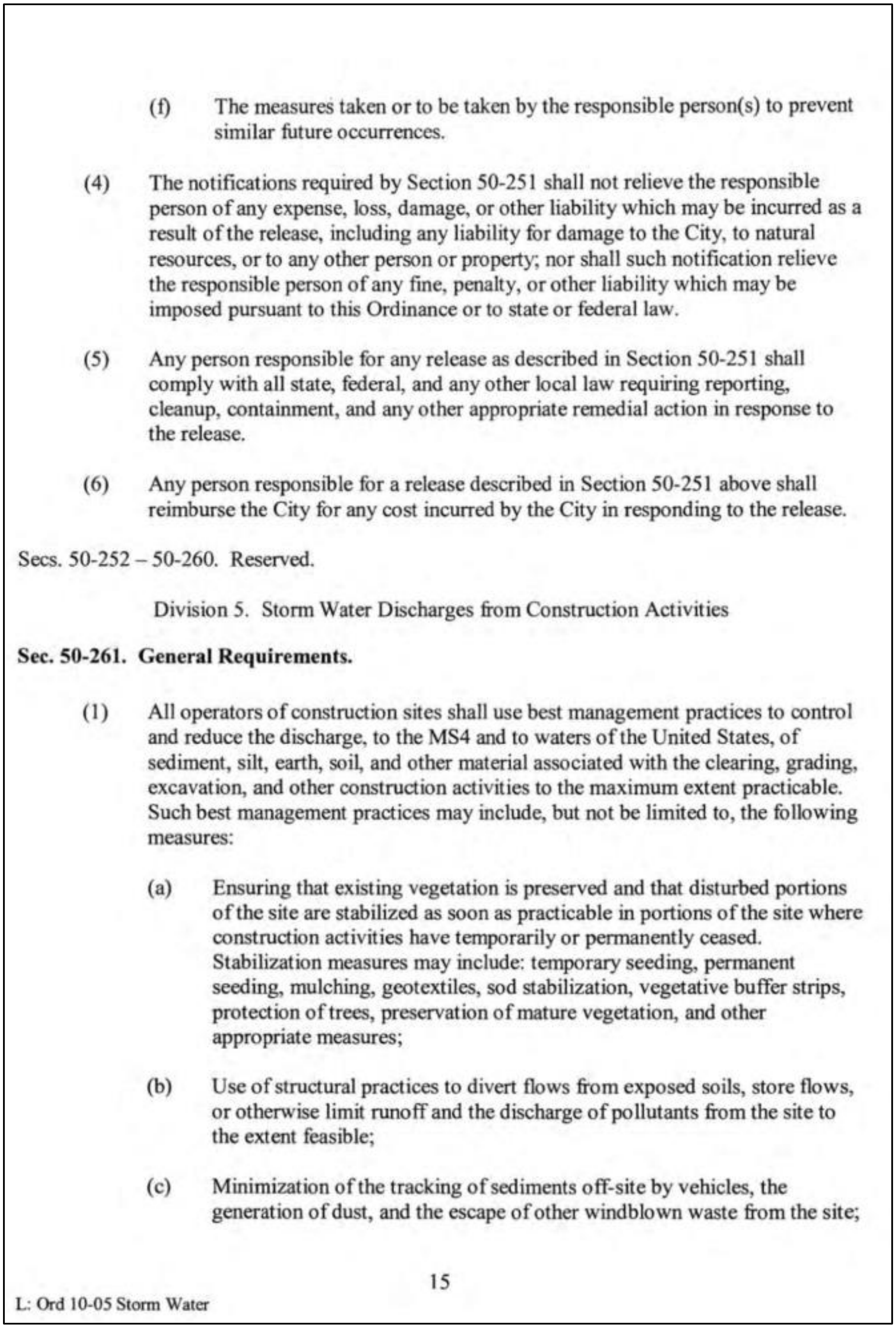
(a) The ultimate duration, concentration, and quantity of the release;

(b) All actions taken to respond to, contain, and clean up the released substances, and all precautions taken to minimize the impacts;

(c) Any known or anticipated acute or chronic health risks associated with the release;

(d) Where appropriate, advice regarding medical attention necessary for exposed individuals;

(e) The identity of any governmental/private sector representatives responding to the release; and



(f) The measures taken or to be taken by the responsible person(s) to prevent similar future occurrences.

(4) The notifications required by Section 50-251 shall not relieve the responsible person of any expense, loss, damage, or other liability which may be incurred as a result of the release, including any liability for damage to the City, to natural resources, or to any other person or property; nor shall such notification relieve the responsible person of any fine, penalty, or other liability which may be imposed pursuant to this Ordinance or to state or federal law.

(5) Any person responsible for any release as described in Section 50-251 shall comply with all state, federal, and any other local law requiring reporting, cleanup, containment, and any other appropriate remedial action in response to the release.

(6) Any person responsible for a release described in Section 50-251 above shall reimburse the City for any cost incurred by the City in responding to the release.

Secs. 50-252 – 50-260. Reserved.

Division 5. Storm Water Discharges from Construction Activities

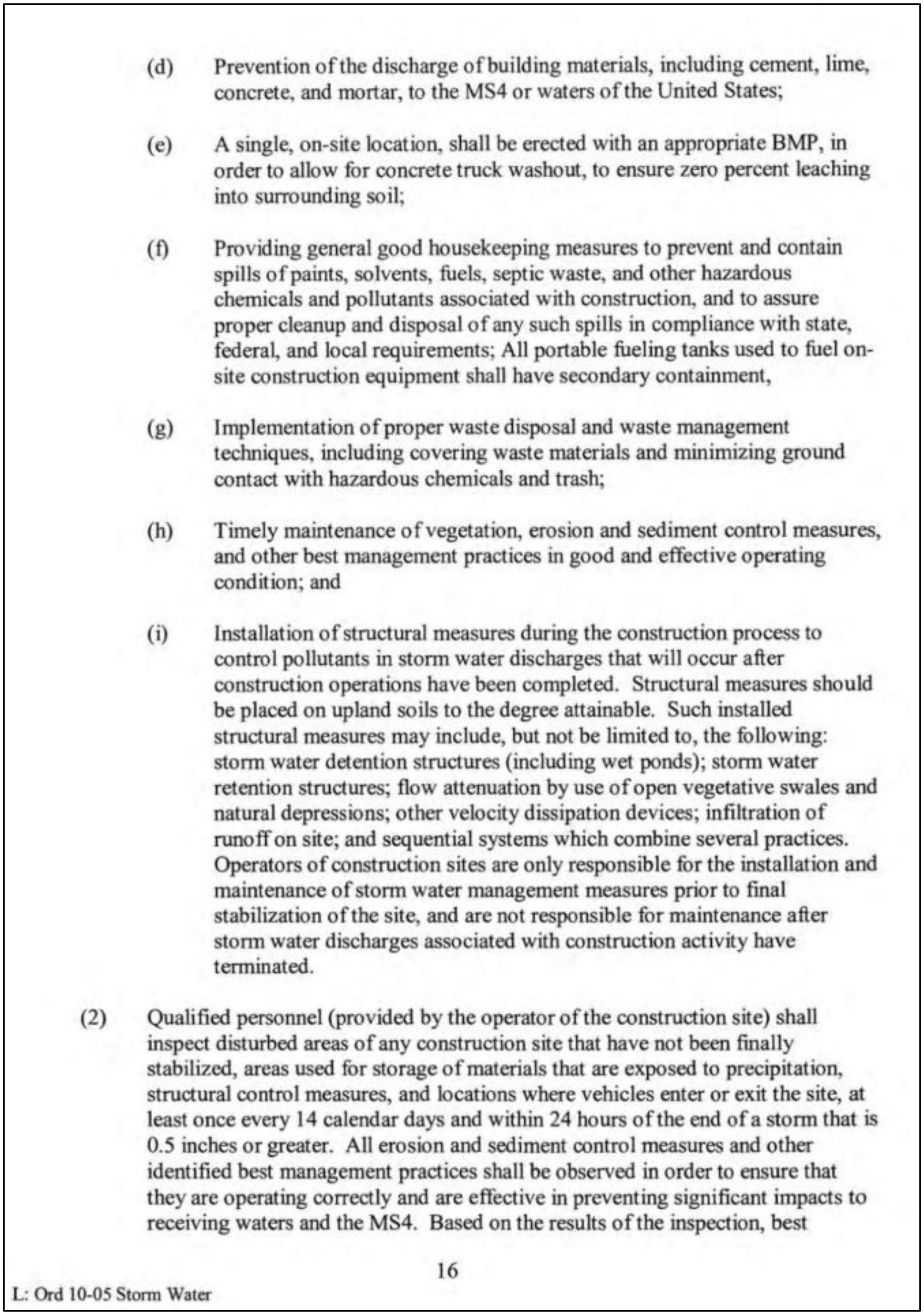
Sec. 50-261. General Requirements.

(1) All operators of construction sites shall use best management practices to control and reduce the discharge, to the MS4 and to waters of the United States, of sediment, silt, earth, soil, and other material associated with the clearing, grading, excavation, and other construction activities to the maximum extent practicable. Such best management practices may include, but not be limited to, the following measures:

(a) Ensuring that existing vegetation is preserved and that disturbed portions of the site are stabilized as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased. Stabilization measures may include: temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures;

(b) Use of structural practices to divert flows from exposed soils, store flows, or otherwise limit runoff and the discharge of pollutants from the site to the extent feasible;

(c) Minimization of the tracking of sediments off-site by vehicles, the generation of dust, and the escape of other windblown waste from the site;



(d) Prevention of the discharge of building materials, including cement, lime, concrete, and mortar, to the MS4 or waters of the United States;

(e) A single, on-site location, shall be erected with an appropriate BMP, in order to allow for concrete truck washout, to ensure zero percent leaching into surrounding soil;

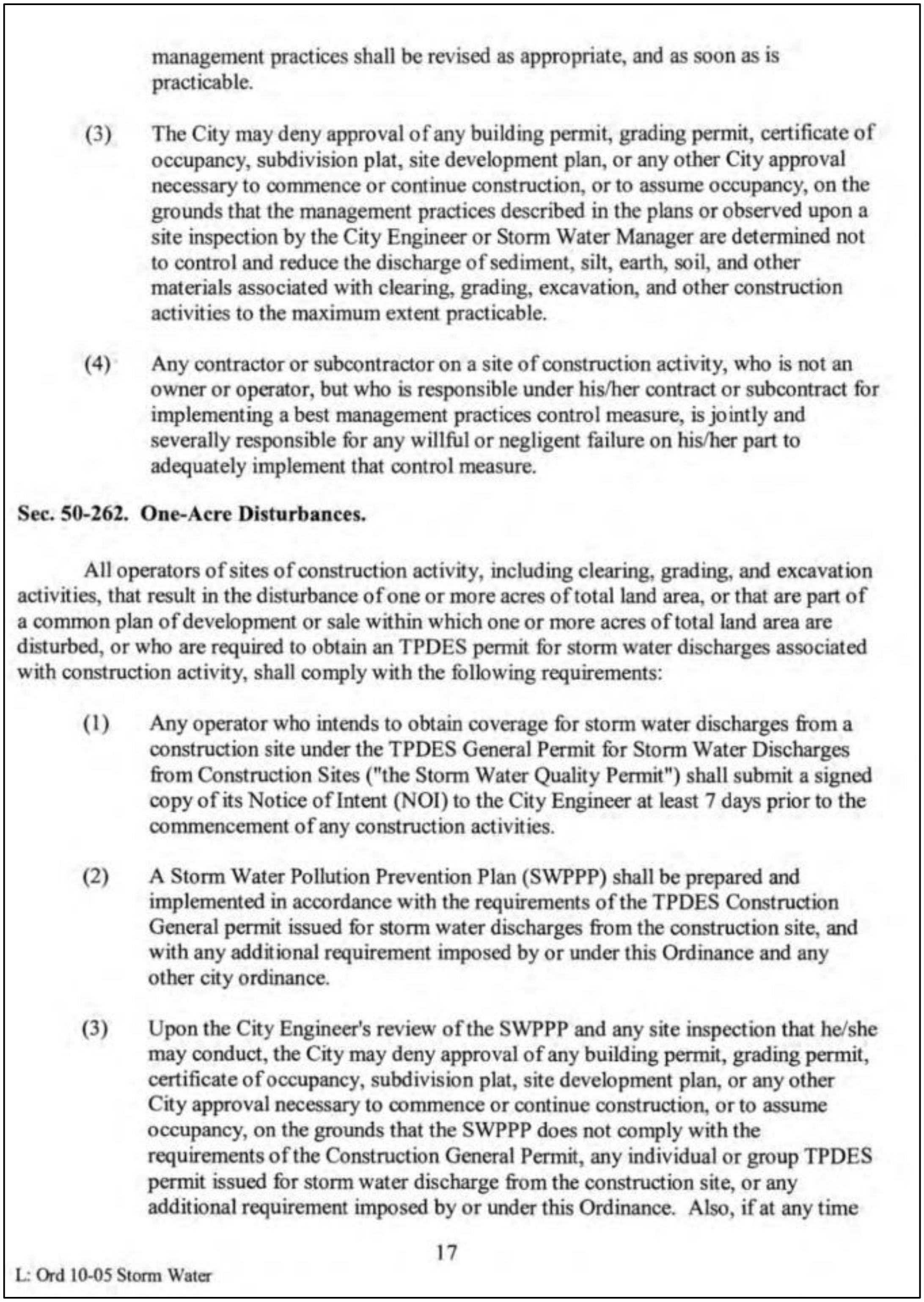
(f) Providing general good housekeeping measures to prevent and contain spills of paints, solvents, fuels, septic waste, and other hazardous chemicals and pollutants associated with construction, and to assure proper cleanup and disposal of any such spills in compliance with state, federal, and local requirements; All portable fueling tanks used to fuel on-site construction equipment shall have secondary containment,

(g) Implementation of proper waste disposal and waste management techniques, including covering waste materials and minimizing ground contact with hazardous chemicals and trash;

(h) Timely maintenance of vegetation, erosion and sediment control measures, and other best management practices in good and effective operating condition; and

(i) Installation of structural measures during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. Structural measures should be placed on upland soils to the degree attainable. Such installed structural measures may include, but not be limited to, the following: storm water detention structures (including wet ponds); storm water retention structures; flow attenuation by use of open vegetative swales and natural depressions; other velocity dissipation devices; infiltration of runoff on site; and sequential systems which combine several practices. Operators of construction sites are only responsible for the installation and maintenance of storm water management measures prior to final stabilization of the site, and are not responsible for maintenance after storm water discharges associated with construction activity have terminated.

(2) Qualified personnel (provided by the operator of the construction site) shall inspect disturbed areas of any construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, and locations where vehicles enter or exit the site, at least once every 14 calendar days and within 24 hours of the end of a storm that is 0.5 inches or greater. All erosion and sediment control measures and other identified best management practices shall be observed in order to ensure that they are operating correctly and are effective in preventing significant impacts to receiving waters and the MS4. Based on the results of the inspection, best



management practices shall be revised as appropriate, and as soon as is practicable.

(3) The City may deny approval of any building permit, grading permit, certificate of occupancy, subdivision plat, site development plan, or any other City approval necessary to commence or continue construction, or to assume occupancy, on the grounds that the management practices described in the plans or observed upon a site inspection by the City Engineer or Storm Water Manager are determined not to control and reduce the discharge of sediment, silt, earth, soil, and other materials associated with clearing, grading, excavation, and other construction activities to the maximum extent practicable.

(4) Any contractor or subcontractor on a site of construction activity, who is not an owner or operator, but who is responsible under his/her contract or subcontract for implementing a best management practices control measure, is jointly and severally responsible for any willful or negligent failure on his/her part to adequately implement that control measure.

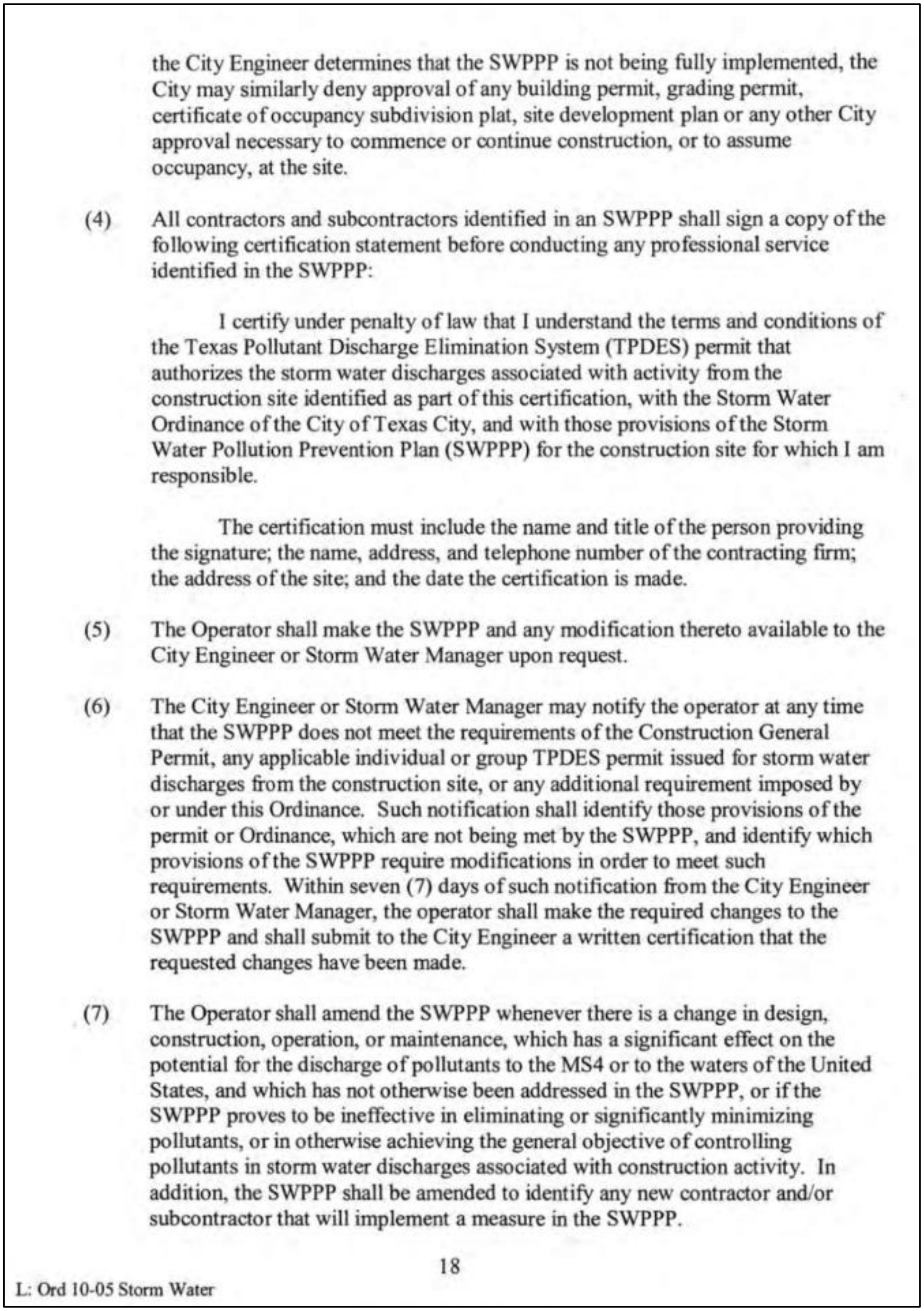
Sec. 50-262. One-Acre Disturbances.

All operators of sites of construction activity, including clearing, grading, and excavation activities, that result in the disturbance of one or more acres of total land area, or that are part of a common plan of development or sale within which one or more acres of total land area are disturbed, or who are required to obtain an TPDES permit for storm water discharges associated with construction activity, shall comply with the following requirements:

(1) Any operator who intends to obtain coverage for storm water discharges from a construction site under the TPDES General Permit for Storm Water Discharges from Construction Sites ("the Storm Water Quality Permit") shall submit a signed copy of its Notice of Intent (NOI) to the City Engineer at least 7 days prior to the commencement of any construction activities.

(2) A Storm Water Pollution Prevention Plan (SWPPP) shall be prepared and implemented in accordance with the requirements of the TPDES Construction General permit issued for storm water discharges from the construction site, and with any additional requirement imposed by or under this Ordinance and any other city ordinance.

(3) Upon the City Engineer's review of the SWPPP and any site inspection that he/she may conduct, the City may deny approval of any building permit, grading permit, certificate of occupancy, subdivision plat, site development plan, or any other City approval necessary to commence or continue construction, or to assume occupancy, on the grounds that the SWPPP does not comply with the requirements of the Construction General Permit, any individual or group TPDES permit issued for storm water discharge from the construction site, or any additional requirement imposed by or under this Ordinance. Also, if at any time



the City Engineer determines that the SWPPP is not being fully implemented, the City may similarly deny approval of any building permit, grading permit, certificate of occupancy subdivision plat, site development plan or any other City approval necessary to commence or continue construction, or to assume occupancy, at the site.

(4) All contractors and subcontractors identified in an SWPPP shall sign a copy of the following certification statement before conducting any professional service identified in the SWPPP:

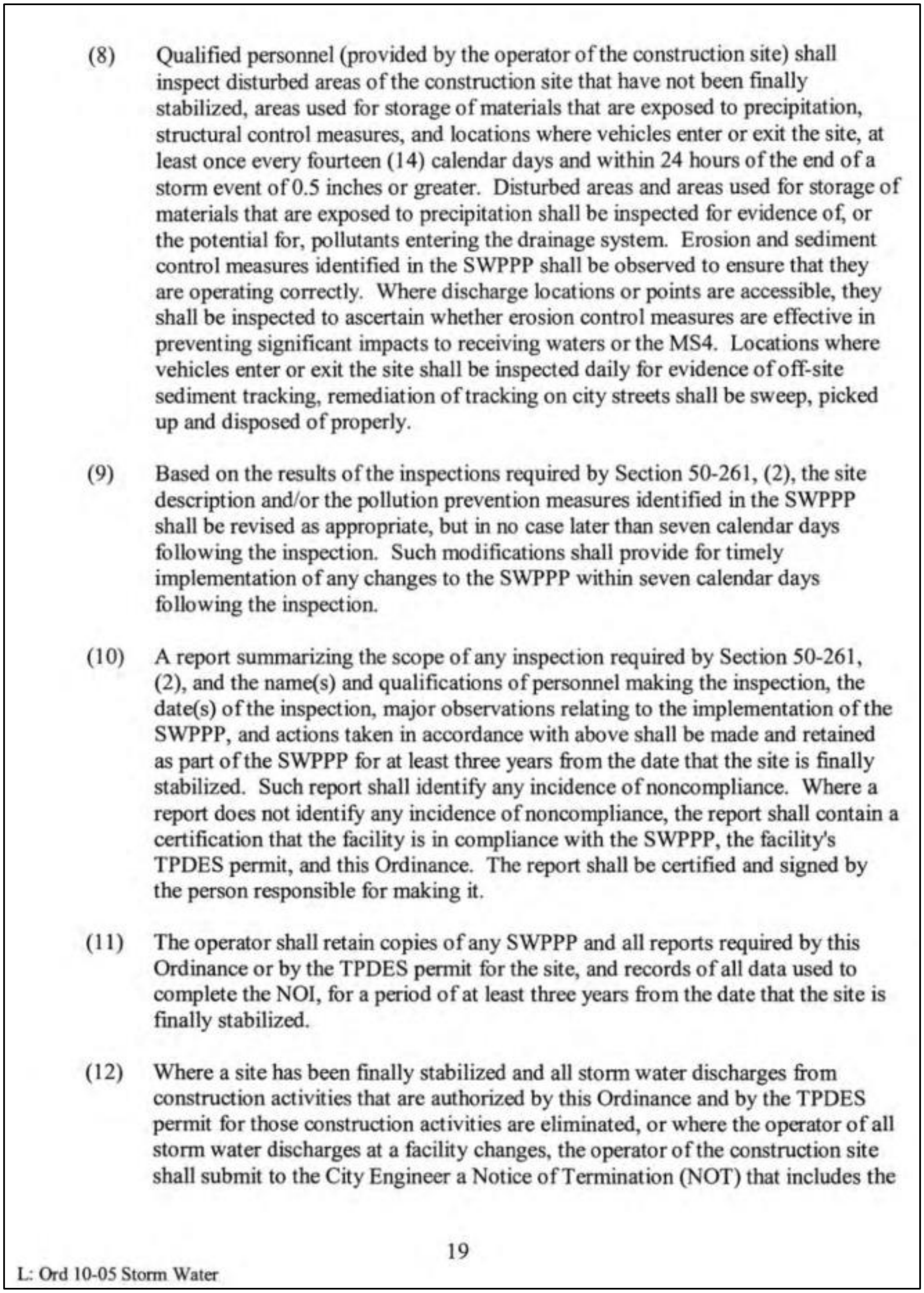
I certify under penalty of law that I understand the terms and conditions of the Texas Pollutant Discharge Elimination System (TPDES) permit that authorizes the storm water discharges associated with activity from the construction site identified as part of this certification, with the Storm Water Ordinance of the City of Texas City, and with those provisions of the Storm Water Pollution Prevention Plan (SWPPP) for the construction site for which I am responsible.

The certification must include the name and title of the person providing the signature; the name, address, and telephone number of the contracting firm; the address of the site; and the date the certification is made.

(5) The Operator shall make the SWPPP and any modification thereto available to the City Engineer or Storm Water Manager upon request.

(6) The City Engineer or Storm Water Manager may notify the operator at any time that the SWPPP does not meet the requirements of the Construction General Permit, any applicable individual or group TPDES permit issued for storm water discharges from the construction site, or any additional requirement imposed by or under this Ordinance. Such notification shall identify those provisions of the permit or Ordinance, which are not being met by the SWPPP, and identify which provisions of the SWPPP require modifications in order to meet such requirements. Within seven (7) days of such notification from the City Engineer or Storm Water Manager, the operator shall make the required changes to the SWPPP and shall submit to the City Engineer a written certification that the requested changes have been made.

(7) The Operator shall amend the SWPPP whenever there is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to the MS4 or to the waters of the United States, and which has not otherwise been addressed in the SWPPP, or if the SWPPP proves to be ineffective in eliminating or significantly minimizing pollutants, or in otherwise achieving the general objective of controlling pollutants in storm water discharges associated with construction activity. In addition, the SWPPP shall be amended to identify any new contractor and/or subcontractor that will implement a measure in the SWPPP.



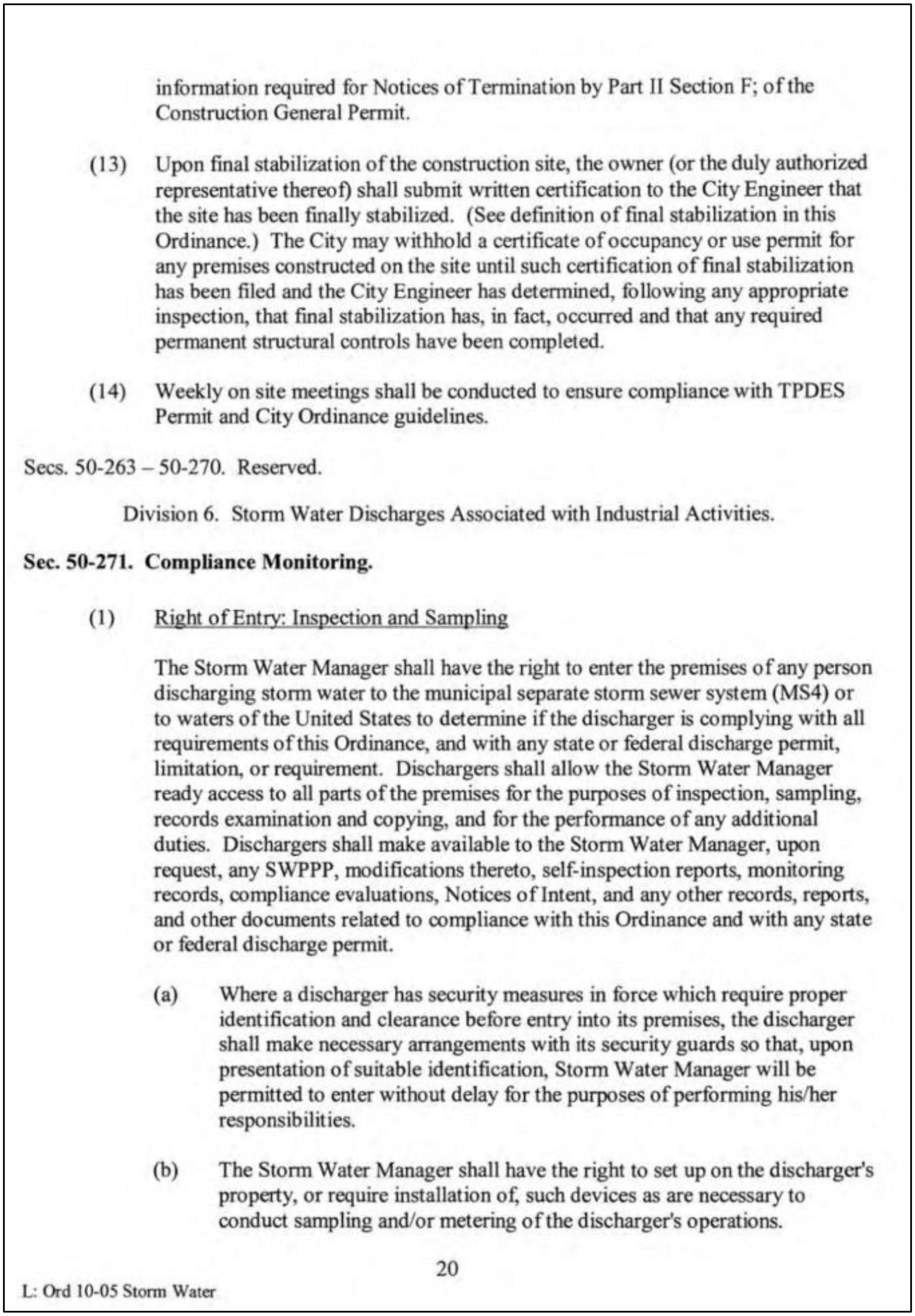
(8) Qualified personnel (provided by the operator of the construction site) shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, and locations where vehicles enter or exit the site, at least once every fourteen (14) calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the SWPPP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters or the MS4. Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site sediment tracking, remediation of tracking on city streets shall be sweep, picked up and disposed of properly.

(9) Based on the results of the inspections required by Section 50-261, (2), the site description and/or the pollution prevention measures identified in the SWPPP shall be revised as appropriate, but in no case later than seven calendar days following the inspection. Such modifications shall provide for timely implementation of any changes to the SWPPP within seven calendar days following the inspection.

(10) A report summarizing the scope of any inspection required by Section 50-261, (2), and the name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the SWPPP, and actions taken in accordance with above shall be made and retained as part of the SWPPP for at least three years from the date that the site is finally stabilized. Such report shall identify any incidence of noncompliance. Where a report does not identify any incidence of noncompliance, the report shall contain a certification that the facility is in compliance with the SWPPP, the facility's TPDES permit, and this Ordinance. The report shall be certified and signed by the person responsible for making it.

(11) The operator shall retain copies of any SWPPP and all reports required by this Ordinance or by the TPDES permit for the site, and records of all data used to complete the NOI, for a period of at least three years from the date that the site is finally stabilized.

(12) Where a site has been finally stabilized and all storm water discharges from construction activities that are authorized by this Ordinance and by the TPDES permit for those construction activities are eliminated, or where the operator of all storm water discharges at a facility changes, the operator of the construction site shall submit to the City Engineer a Notice of Termination (NOT) that includes the



information required for Notices of Termination by Part II Section F; of the Construction General Permit.

(13) Upon final stabilization of the construction site, the owner (or the duly authorized representative thereof) shall submit written certification to the City Engineer that the site has been finally stabilized. (See definition of final stabilization in this Ordinance.) The City may withhold a certificate of occupancy or use permit for any premises constructed on the site until such certification of final stabilization has been filed and the City Engineer has determined, following any appropriate inspection, that final stabilization has, in fact, occurred and that any required permanent structural controls have been completed.

(14) Weekly on site meetings shall be conducted to ensure compliance with TPDES Permit and City Ordinance guidelines.

Secs. 50-263 – 50-270. Reserved.

Division 6. Storm Water Discharges Associated with Industrial Activities.

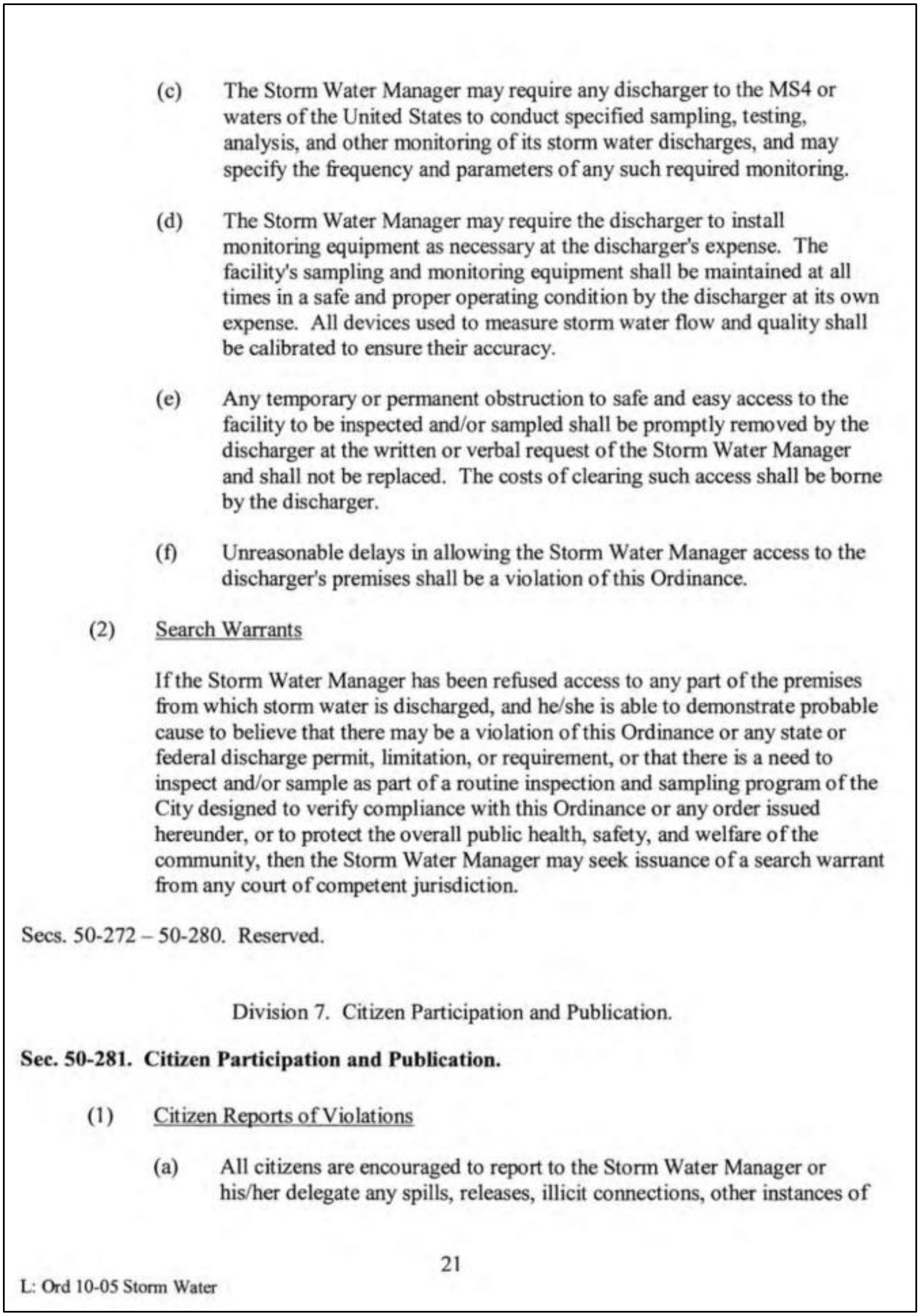
Sec. 50-271. Compliance Monitoring.

(1) Right of Entry: Inspection and Sampling

The Storm Water Manager shall have the right to enter the premises of any person discharging storm water to the municipal separate storm sewer system (MS4) or to waters of the United States to determine if the discharger is complying with all requirements of this Ordinance, and with any state or federal discharge permit, limitation, or requirement. Dischargers shall allow the Storm Water Manager ready access to all parts of the premises for the purposes of inspection, sampling, records examination and copying, and for the performance of any additional duties. Dischargers shall make available to the Storm Water Manager, upon request, any SWPPP, modifications thereto, self-inspection reports, monitoring records, compliance evaluations, Notices of Intent, and any other records, reports, and other documents related to compliance with this Ordinance and with any state or federal discharge permit.

(a) Where a discharger has security measures in force which require proper identification and clearance before entry into its premises, the discharger shall make necessary arrangements with its security guards so that, upon presentation of suitable identification, Storm Water Manager will be permitted to enter without delay for the purposes of performing his/her responsibilities.

(b) The Storm Water Manager shall have the right to set up on the discharger's property, or require installation of, such devices as are necessary to conduct sampling and/or metering of the discharger's operations.



(c) The Storm Water Manager may require any discharger to the MS4 or waters of the United States to conduct specified sampling, testing, analysis, and other monitoring of its storm water discharges, and may specify the frequency and parameters of any such required monitoring.

(d) The Storm Water Manager may require the discharger to install monitoring equipment as necessary at the discharger's expense. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the discharger at its own expense. All devices used to measure storm water flow and quality shall be calibrated to ensure their accuracy.

(e) Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the discharger at the written or verbal request of the Storm Water Manager and shall not be replaced. The costs of clearing such access shall be borne by the discharger.

(f) Unreasonable delays in allowing the Storm Water Manager access to the discharger's premises shall be a violation of this Ordinance.

(2) Search Warrants

If the Storm Water Manager has been refused access to any part of the premises from which storm water is discharged, and he/she is able to demonstrate probable cause to believe that there may be a violation of this Ordinance or any state or federal discharge permit, limitation, or requirement, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program of the City designed to verify compliance with this Ordinance or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the Storm Water Manager may seek issuance of a search warrant from any court of competent jurisdiction.

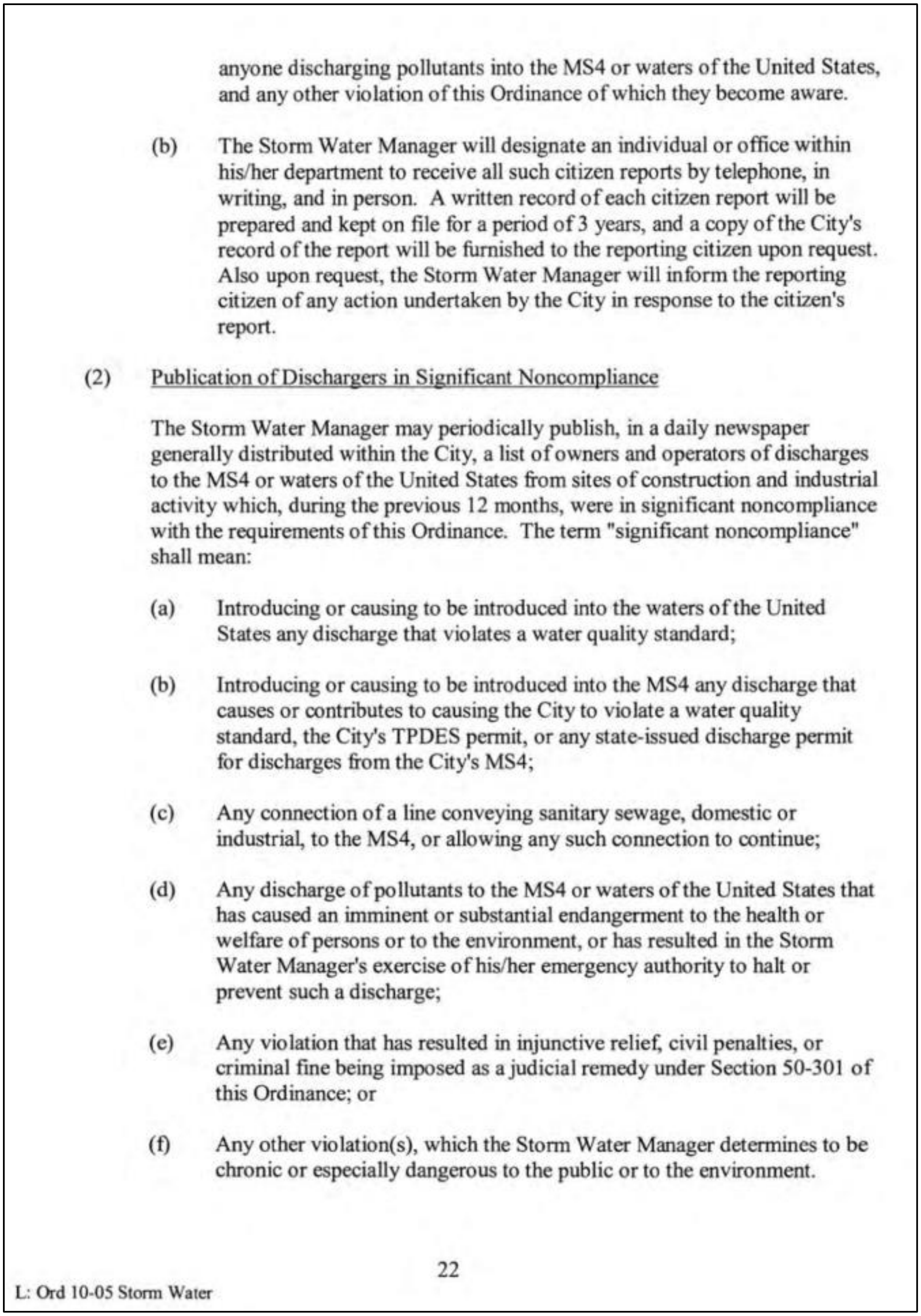
Secs. 50-272 – 50-280. Reserved.

Division 7. Citizen Participation and Publication.

Sec. 50-281. Citizen Participation and Publication.

(1) Citizen Reports of Violations

(a) All citizens are encouraged to report to the Storm Water Manager or his/her delegate any spills, releases, illicit connections, other instances of



anyone discharging pollutants into the MS4 or waters of the United States, and any other violation of this Ordinance of which they become aware.

(b) The Storm Water Manager will designate an individual or office within his/her department to receive all such citizen reports by telephone, in writing, and in person. A written record of each citizen report will be prepared and kept on file for a period of 3 years, and a copy of the City's record of the report will be furnished to the reporting citizen upon request. Also upon request, the Storm Water Manager will inform the reporting citizen of any action undertaken by the City in response to the citizen's report.

(2) <u>Publication of Dischargers in Significant Noncompliance</u>

The Storm Water Manager may periodically publish, in a daily newspaper generally distributed within the City, a list of owners and operators of discharges to the MS4 or waters of the United States from sites of construction and industrial activity which, during the previous 12 months, were in significant noncompliance with the requirements of this Ordinance. The term "significant noncompliance" shall mean:

(a) Introducing or causing to be introduced into the waters of the United States any discharge that violates a water quality standard;

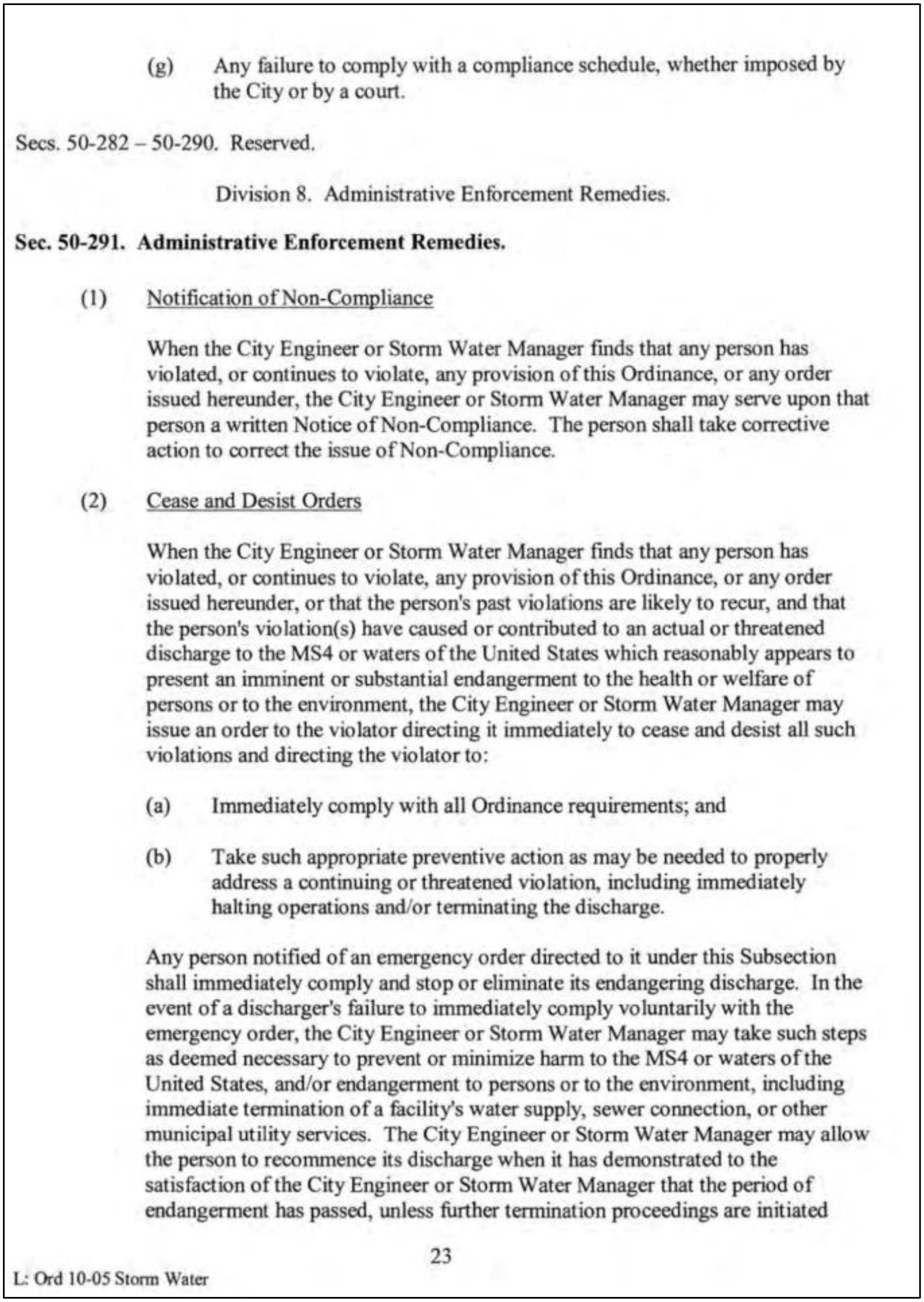
(b) Introducing or causing to be introduced into the MS4 any discharge that causes or contributes to causing the City to violate a water quality standard, the City's TPDES permit, or any state-issued discharge permit for discharges from the City's MS4;

(c) Any connection of a line conveying sanitary sewage, domestic or industrial, to the MS4, or allowing any such connection to continue;

(d) Any discharge of pollutants to the MS4 or waters of the United States that has caused an imminent or substantial endangerment to the health or welfare of persons or to the environment, or has resulted in the Storm Water Manager's exercise of his/her emergency authority to halt or prevent such a discharge;

(e) Any violation that has resulted in injunctive relief, civil penalties, or criminal fine being imposed as a judicial remedy under Section 50-301 of this Ordinance; or

(f) Any other violation(s), which the Storm Water Manager determines to be chronic or especially dangerous to the public or to the environment.



(g) Any failure to comply with a compliance schedule, whether imposed by the City or by a court.

Secs. 50-282 – 50-290. Reserved.

Division 8. Administrative Enforcement Remedies.

Sec. 50-291. Administrative Enforcement Remedies.

(1) Notification of Non-Compliance

When the City Engineer or Storm Water Manager finds that any person has violated, or continues to violate, any provision of this Ordinance, or any order issued hereunder, the City Engineer or Storm Water Manager may serve upon that person a written Notice of Non-Compliance. The person shall take corrective action to correct the issue of Non-Compliance.

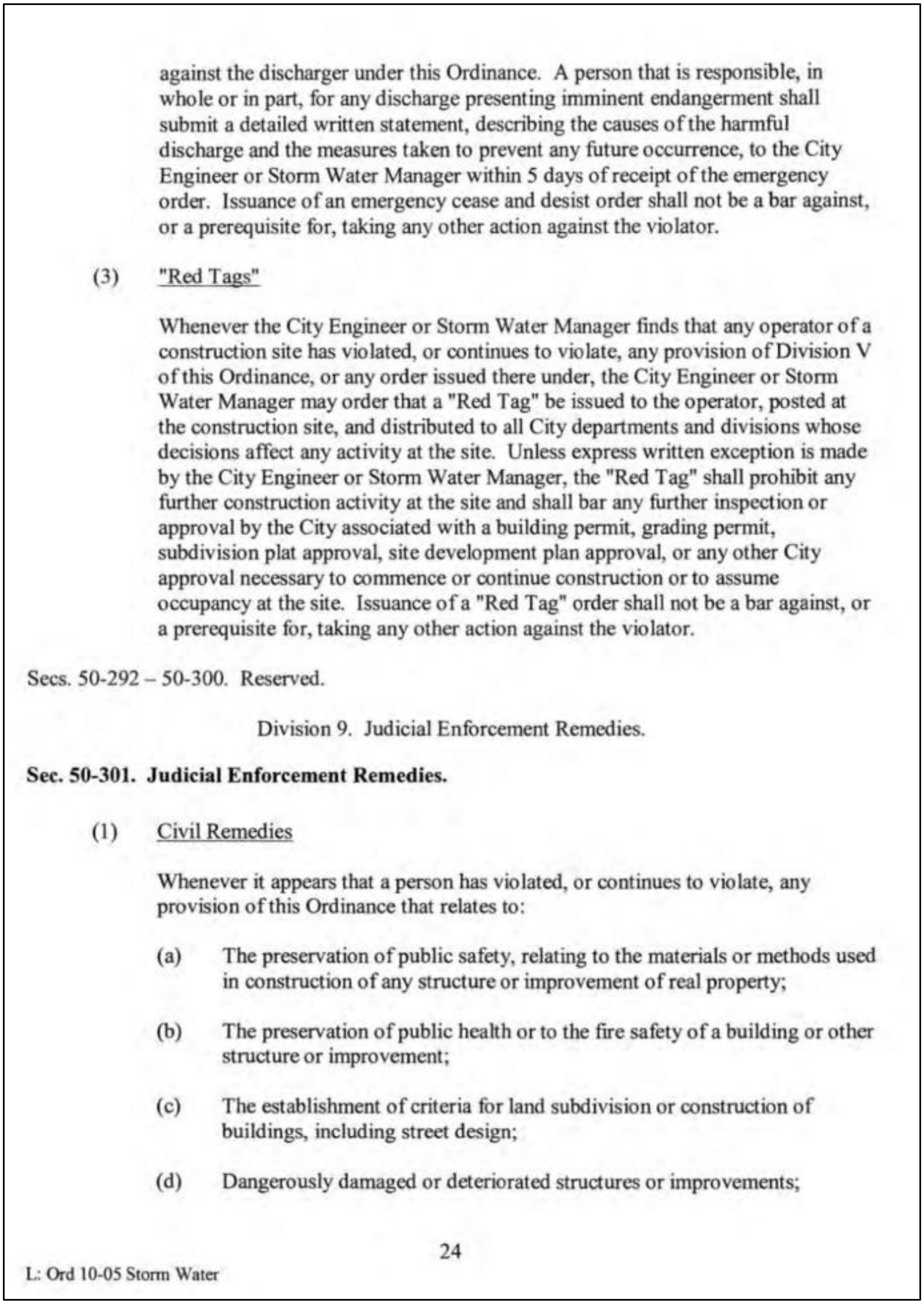
(2) Cease and Desist Orders

When the City Engineer or Storm Water Manager finds that any person has violated, or continues to violate, any provision of this Ordinance, or any order issued hereunder, or that the person's past violations are likely to recur, and that the person's violation(s) have caused or contributed to an actual or threatened discharge to the MS4 or waters of the United States which reasonably appears to present an imminent or substantial endangerment to the health or welfare of persons or to the environment, the City Engineer or Storm Water Manager may issue an order to the violator directing it immediately to cease and desist all such violations and directing the violator to:

(a) Immediately comply with all Ordinance requirements; and

(b) Take such appropriate preventive action as may be needed to properly address a continuing or threatened violation, including immediately halting operations and/or terminating the discharge.

Any person notified of an emergency order directed to it under this Subsection shall immediately comply and stop or eliminate its endangering discharge. In the event of a discharger's failure to immediately comply voluntarily with the emergency order, the City Engineer or Storm Water Manager may take such steps as deemed necessary to prevent or minimize harm to the MS4 or waters of the United States, and/or endangerment to persons or to the environment, including immediate termination of a facility's water supply, sewer connection, or other municipal utility services. The City Engineer or Storm Water Manager may allow the person to recommence its discharge when it has demonstrated to the satisfaction of the City Engineer or Storm Water Manager that the period of endangerment has passed, unless further termination proceedings are initiated



against the discharger under this Ordinance. A person that is responsible, in whole or in part, for any discharge presenting imminent endangerment shall submit a detailed written statement, describing the causes of the harmful discharge and the measures taken to prevent any future occurrence, to the City Engineer or Storm Water Manager within 5 days of receipt of the emergency order. Issuance of an emergency cease and desist order shall not be a bar against, or a prerequisite for, taking any other action against the violator.

(3) "Red Tags"

Whenever the City Engineer or Storm Water Manager finds that any operator of a construction site has violated, or continues to violate, any provision of Division V of this Ordinance, or any order issued there under, the City Engineer or Storm Water Manager may order that a "Red Tag" be issued to the operator, posted at the construction site, and distributed to all City departments and divisions whose decisions affect any activity at the site. Unless express written exception is made by the City Engineer or Storm Water Manager, the "Red Tag" shall prohibit any further construction activity at the site and shall bar any further inspection or approval by the City associated with a building permit, grading permit, subdivision plat approval, site development plan approval, or any other City approval necessary to commence or continue construction or to assume occupancy at the site. Issuance of a "Red Tag" order shall not be a bar against, or a prerequisite for, taking any other action against the violator.

Secs. 50-292 – 50-300. Reserved.

Division 9. Judicial Enforcement Remedies.

Sec. 50-301. Judicial Enforcement Remedies.

(1) Civil Remedies

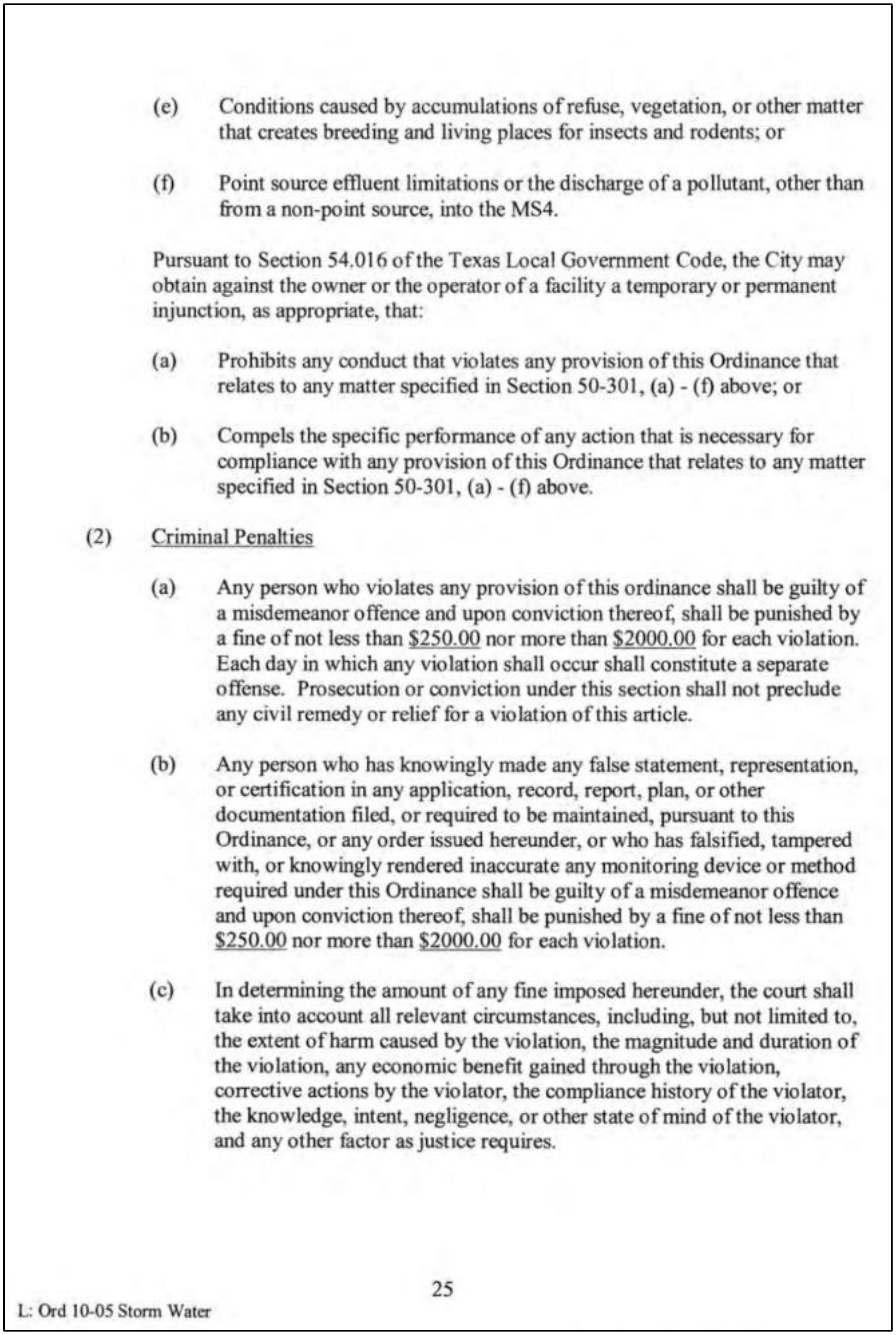
Whenever it appears that a person has violated, or continues to violate, any provision of this Ordinance that relates to:

(a) The preservation of public safety, relating to the materials or methods used in construction of any structure or improvement of real property;

(b) The preservation of public health or to the fire safety of a building or other structure or improvement;

(c) The establishment of criteria for land subdivision or construction of buildings, including street design;

(d) Dangerously damaged or deteriorated structures or improvements;



(e) Conditions caused by accumulations of refuse, vegetation, or other matter that creates breeding and living places for insects and rodents; or

(f) Point source effluent limitations or the discharge of a pollutant, other than from a non-point source, into the MS4.

Pursuant to Section 54.016 of the Texas Local Government Code, the City may obtain against the owner or the operator of a facility a temporary or permanent injunction, as appropriate, that:

(a) Prohibits any conduct that violates any provision of this Ordinance that relates to any matter specified in Section 50-301, (a) - (f) above; or

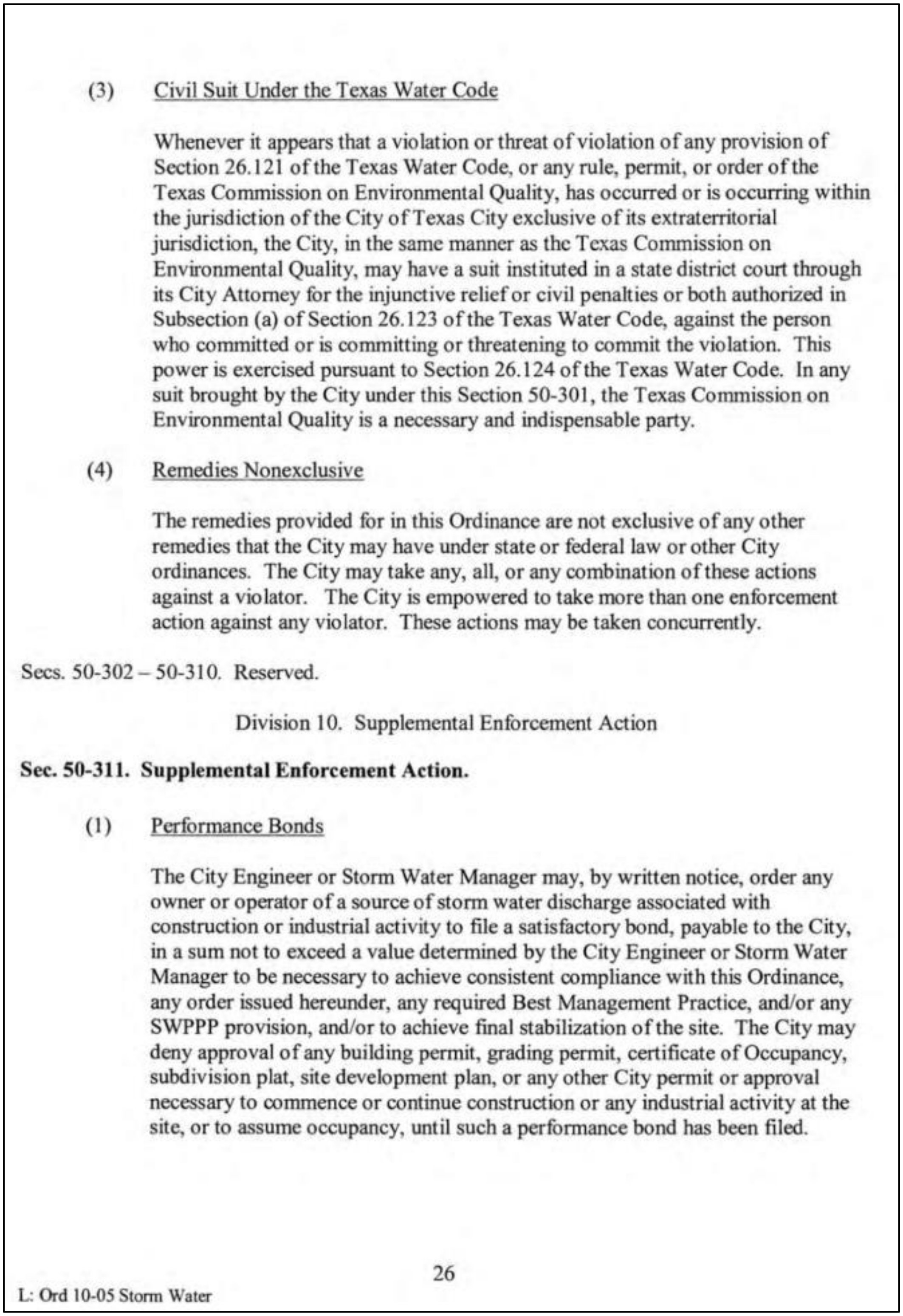
(b) Compels the specific performance of any action that is necessary for compliance with any provision of this Ordinance that relates to any matter specified in Section 50-301, (a) - (f) above.

(2) Criminal Penalties

(a) Any person who violates any provision of this ordinance shall be guilty of a misdemeanor offence and upon conviction thereof, shall be punished by a fine of not less than $250.00 nor more than $2000.00 for each violation. Each day in which any violation shall occur shall constitute a separate offense. Prosecution or conviction under this section shall not preclude any civil remedy or relief for a violation of this article.

(b) Any person who has knowingly made any false statement, representation, or certification in any application, record, report, plan, or other documentation filed, or required to be maintained, pursuant to this Ordinance, or any order issued hereunder, or who has falsified, tampered with, or knowingly rendered inaccurate any monitoring device or method required under this Ordinance shall be guilty of a misdemeanor offence and upon conviction thereof, shall be punished by a fine of not less than $250.00 nor more than $2000.00 for each violation.

(c) In determining the amount of any fine imposed hereunder, the court shall take into account all relevant circumstances, including, but not limited to, the extent of harm caused by the violation, the magnitude and duration of the violation, any economic benefit gained through the violation, corrective actions by the violator, the compliance history of the violator, the knowledge, intent, negligence, or other state of mind of the violator, and any other factor as justice requires.



(3) Civil Suit Under the Texas Water Code

Whenever it appears that a violation or threat of violation of any provision of Section 26.121 of the Texas Water Code, or any rule, permit, or order of the Texas Commission on Environmental Quality, has occurred or is occurring within the jurisdiction of the City of Texas City exclusive of its extraterritorial jurisdiction, the City, in the same manner as the Texas Commission on Environmental Quality, may have a suit instituted in a state district court through its City Attorney for the injunctive relief or civil penalties or both authorized in Subsection (a) of Section 26.123 of the Texas Water Code, against the person who committed or is committing or threatening to commit the violation. This power is exercised pursuant to Section 26.124 of the Texas Water Code. In any suit brought by the City under this Section 50-301, the Texas Commission on Environmental Quality is a necessary and indispensable party.

(4) Remedies Nonexclusive

The remedies provided for in this Ordinance are not exclusive of any other remedies that the City may have under state or federal law or other City ordinances. The City may take any, all, or any combination of these actions against a violator. The City is empowered to take more than one enforcement action against any violator. These actions may be taken concurrently.

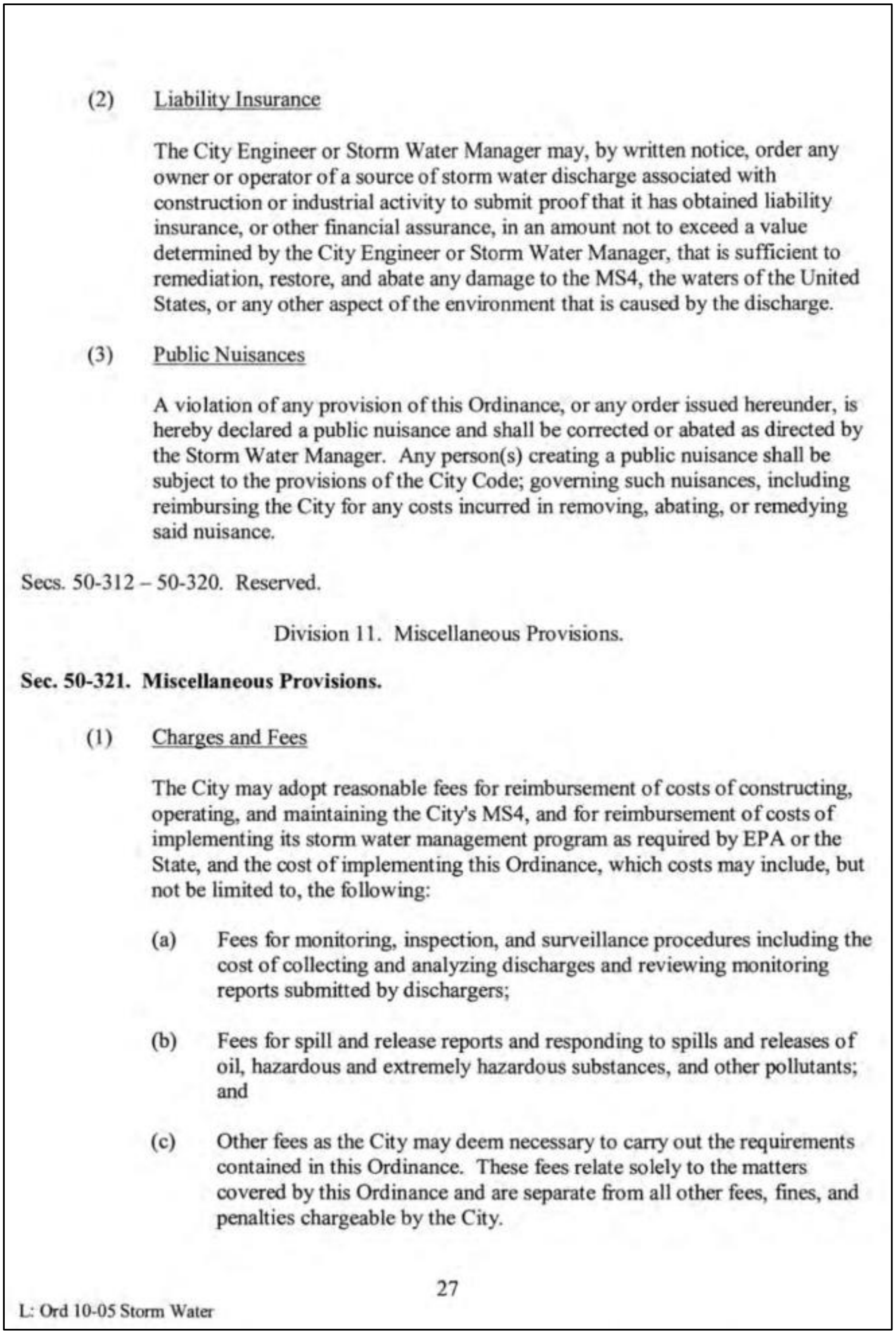
Secs. 50-302 – 50-310. Reserved.

Division 10. Supplemental Enforcement Action

Sec. 50-311. Supplemental Enforcement Action.

(1) Performance Bonds

The City Engineer or Storm Water Manager may, by written notice, order any owner or operator of a source of storm water discharge associated with construction or industrial activity to file a satisfactory bond, payable to the City, in a sum not to exceed a value determined by the City Engineer or Storm Water Manager to be necessary to achieve consistent compliance with this Ordinance, any order issued hereunder, any required Best Management Practice, and/or any SWPPP provision, and/or to achieve final stabilization of the site. The City may deny approval of any building permit, grading permit, certificate of Occupancy, subdivision plat, site development plan, or any other City permit or approval necessary to commence or continue construction or any industrial activity at the site, or to assume occupancy, until such a performance bond has been filed.



(2) Liability Insurance

The City Engineer or Storm Water Manager may, by written notice, order any owner or operator of a source of storm water discharge associated with construction or industrial activity to submit proof that it has obtained liability insurance, or other financial assurance, in an amount not to exceed a value determined by the City Engineer or Storm Water Manager, that is sufficient to remediation, restore, and abate any damage to the MS4, the waters of the United States, or any other aspect of the environment that is caused by the discharge.

(3) Public Nuisances

A violation of any provision of this Ordinance, or any order issued hereunder, is hereby declared a public nuisance and shall be corrected or abated as directed by the Storm Water Manager. Any person(s) creating a public nuisance shall be subject to the provisions of the City Code; governing such nuisances, including reimbursing the City for any costs incurred in removing, abating, or remedying said nuisance.

Secs. 50-312 – 50-320. Reserved.

Division 11. Miscellaneous Provisions.

Sec. 50-321. Miscellaneous Provisions.

(1) Charges and Fees

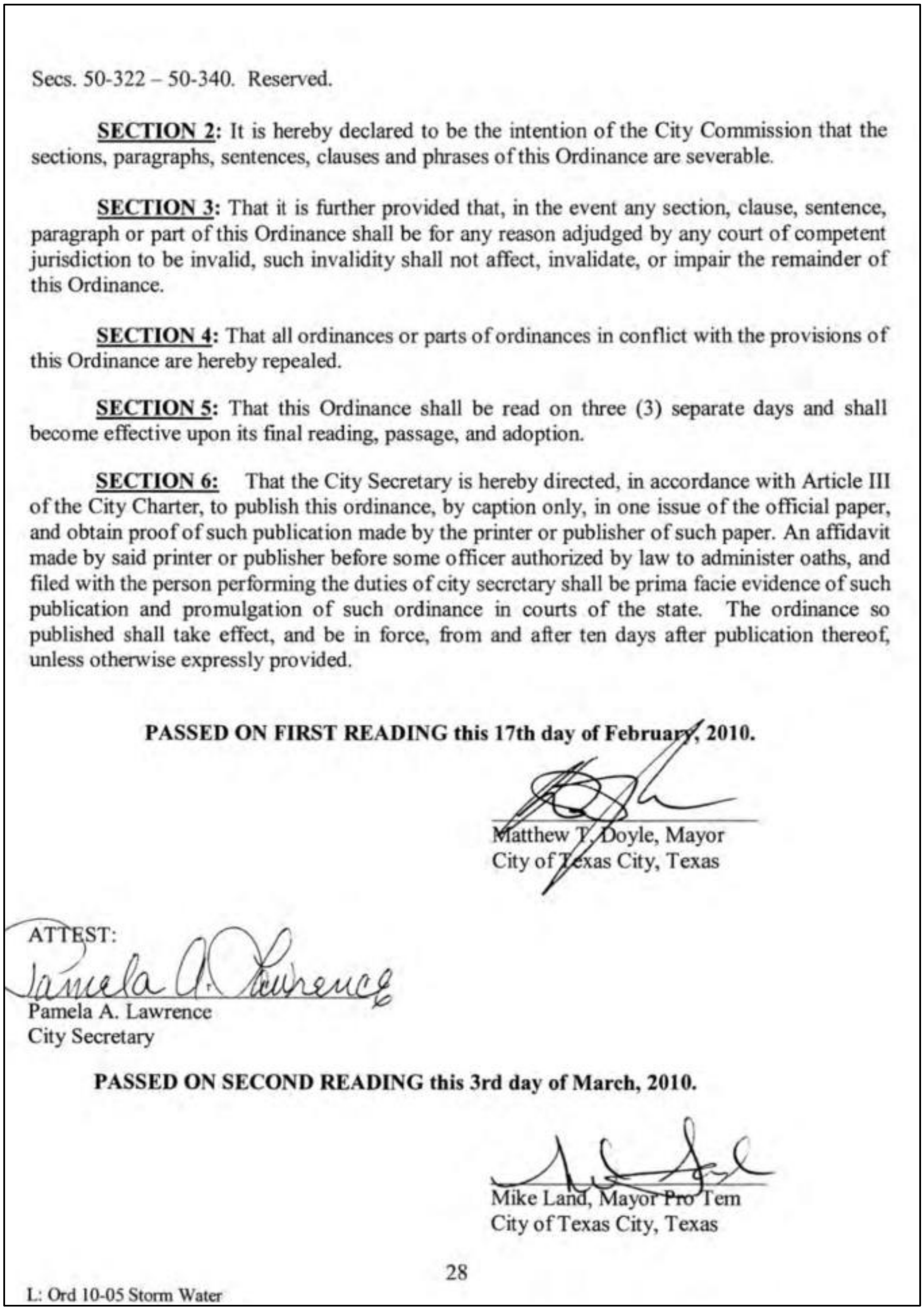
The City may adopt reasonable fees for reimbursement of costs of constructing, operating, and maintaining the City's MS4, and for reimbursement of costs of implementing its storm water management program as required by EPA or the State, and the cost of implementing this Ordinance, which costs may include, but not be limited to, the following:

(a) Fees for monitoring, inspection, and surveillance procedures including the cost of collecting and analyzing discharges and reviewing monitoring reports submitted by dischargers;

(b) Fees for spill and release reports and responding to spills and releases of oil, hazardous and extremely hazardous substances, and other pollutants; and

(c) Other fees as the City may deem necessary to carry out the requirements contained in this Ordinance. These fees relate solely to the matters covered by this Ordinance and are separate from all other fees, fines, and penalties chargeable by the City.

Floodplain Ordinance (continued)



Secs. 50-322 – 50-340. Reserved.

SECTION 2: It is hereby declared to be the intention of the City Commission that the sections, paragraphs, sentences, clauses and phrases of this Ordinance are severable.

SECTION 3: That it is further provided that, in the event any section, clause, sentence, paragraph or part of this Ordinance shall be for any reason adjudged by any court of competent jurisdiction to be invalid, such invalidity shall not affect, invalidate, or impair the remainder of this Ordinance.

SECTION 4: That all ordinances or parts of ordinances in conflict with the provisions of this Ordinance are hereby repealed.

SECTION 5: That this Ordinance shall be read on three (3) separate days and shall become effective upon its final reading, passage, and adoption.

SECTION 6: That the City Secretary is hereby directed, in accordance with Article III of the City Charter, to publish this ordinance, by caption only, in one issue of the official paper, and obtain proof of such publication made by the printer or publisher of such paper. An affidavit made by said printer or publisher before some officer authorized by law to administer oaths, and filed with the person performing the duties of city secrctary shall be prima facie evidence of such publication and promulgation of such ordinance in courts of the state. The ordinance so published shall take effect, and be in force, from and after ten days after publication thereof, unless otherwise expressly provided.

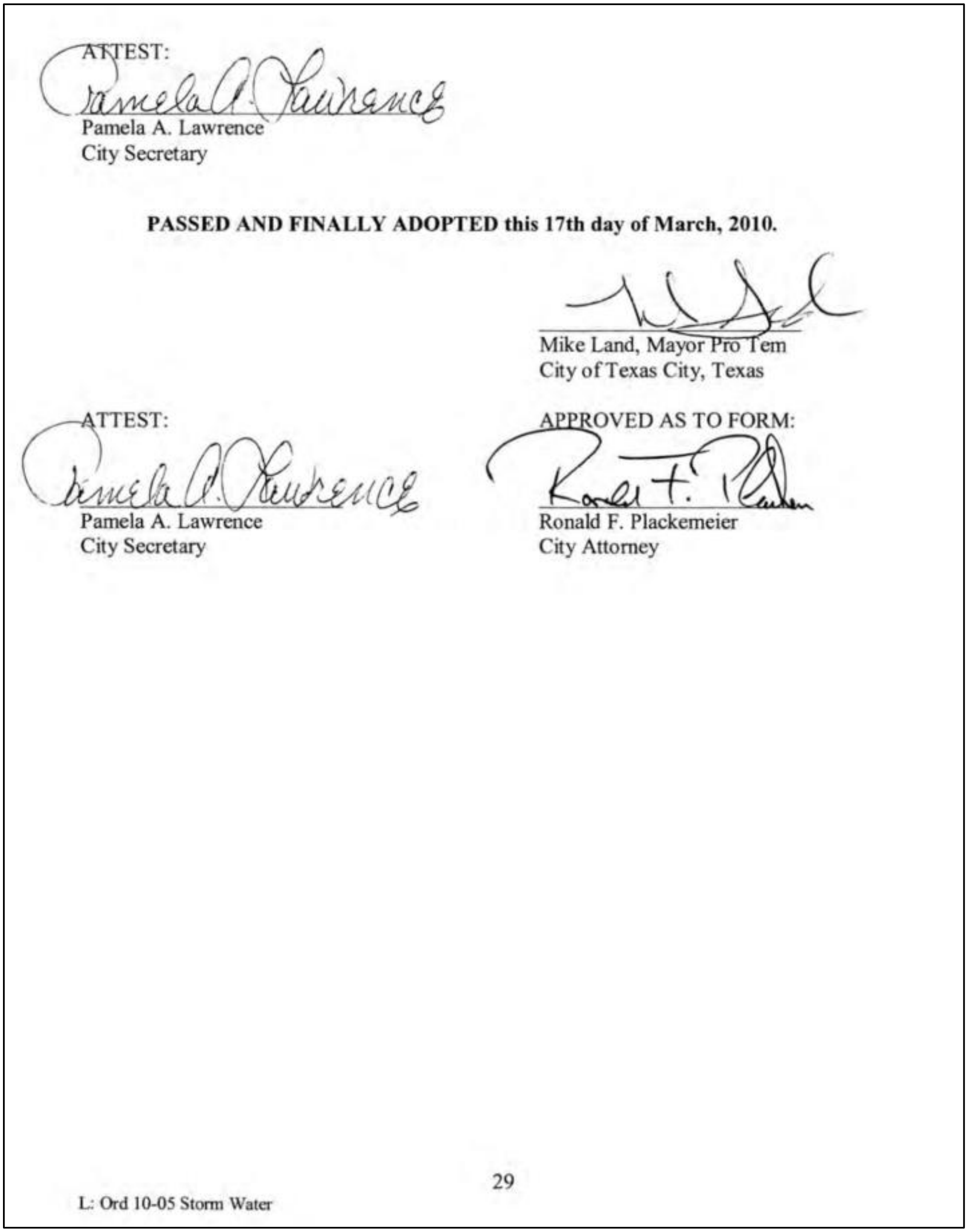
PASSED ON FIRST READING this 17th day of February, 2010.

Matthew T. Doyle, Mayor
City of Texas City, Texas

ATTEST:
Pamela A. Lawrence
Pamela A. Lawrence
City Secretary

PASSED ON SECOND READING this 3rd day of March, 2010.

Mike Land, Mayor Pro Tem
City of Texas City, Texas



ATTEST:

Pamela A. Lawrence

Pamela A. Lawrence
City Secretary

PASSED AND FINALLY ADOPTED this 17th day of March, 2010.

Mike Land, Mayor Pro Tem
City of Texas City, Texas

ATTEST:

Pamela A. Lawrence

Pamela A. Lawrence
City Secretary

APPROVED AS TO FORM:

Ronald F. Plackemeier
City Attorney

Appendix E: Capability Assessment

Jurisdiction and/or Dept.:	**City of Texas City**		
Name and Title:	Joe Tumbleson, Jr. Emergency Management Coordinator		

1. PLANNING AND REGULATORY CAPABILITY - Please indicate whether the following planning or regulatory tools (plans, ordinances, codes or programs) are currently in place or under development for your jurisdiction. Please provide additional comments or explanations in the space provided or with attachments.

Planning and Regulatory Resource	**In Place**	**Under Development**	**Comments**
Comprehensive / Master Plan	YES		The City is currently engaged in updating the comprehensive master plan; therefore, we do not have an attachment to provide at this time.
Stormwater Management Plan / Ordinance	YES		https://www.texascitytx.gov/DocumentCenter/View/668/Stormwater-Ordinance-PDF
Emergency Operations Plan	YES		Basic Emergency Operations Plan approved by the State of Texas
Capital Improvements Plan	YES		No comment
Floodplain Management Plan	YES		https://codelibrary.amlegal.com/codes/texascity/latest/texascity_tx/0-0-0-8877 Chapter 157: Flood Damage Prevention
Economic Development Plan	YES		Pathways-to-Prosperity-Economic-Development-Action-Plan-for-Texas-City-TX
Transportation Plan	NO		N/A
Wildfire Protection Plan	NO		N/A

Stormwater Ordinance	YES		https://www.texascitytx.gov/DocumentCenter/View/5738/Pathways-to-Prosperity-Economic-Development-Action-Plan-for-Texas-City-TX?bidId=
NFIP Community Rating System (CRS Program)	NO		We are a participating NFIP Community, but we are not a CRS community (per FEMA)
Floodplain Ordinance	YES		https://codelibrary.amlegal.com/codes/texascity/latest/texascity_tx/0-0-0-8877 Chapter 157: Flood Damage Prevention
Continuity of Operations Plan	NO		N/A
Building Code (include name/year under Comments)	YES		https://codelibrary.amlegal.com/codes/texascity/latest/texascity_tx/0-0-0-7982 International Building Code, 2021 edition
Zoning Ordinance	YES		https://codelibrary.amlegal.com/codes/texascity/latest/texascity_tx/0-0-0-10051
Acquisition of Land for Open Space/Recreation Use	NO		N/A
2. ADMINISTRATIVE AND TECHNICAL CAPABILITY - Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources			
Staff / Personnel Resources	YES		No Comment
Maintenance program to reduce risk (tree trimming, clearing drainage systems)	YES		Through our public works department

Mutual Aid Agreements (between neighboring jurisdictions)	YES		We are members of the Industrial Mutual Aid System, which is a mutual aid system for our industrial sector. We also have mutual aid agreements with neighboring cities in Galveston County.
Mitigation Planning Committee	NO		N/A
Community Planner	YES		Titilayo Smith
Staff Engineer	YES		Mrs. Kim Golden
Emergency manager	YES		Joe Tumbleson
Floodplain manager	YES		Kip Urps
Personnel skilled in Geographic Information Systems (GIS)	YES		David Reeves
Warning Systems/outdoor siren, reverse 911, other	YES		We have 11 outdoor community sirens that alarm if a shelter-in-place is required. We also utilize Everbridge for our emergency alert system, which currently has over 64,000 people registered with it. We also utilize IPAWS, the Integrated Public Alert and Warning System, which can activate emergency alerts on cell phones within a geo-fenced location.
Grant Writer	YES		We have a grants department led by Mrs. Titilayo Smith
Hazard Data/historical disaster data	NO		N/A
Chief Building Official	YES		Casey Bennett
3. FISCAL CAPABILITY - Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources *for hazard mitigation purposes*			
Financial Resources	YES		

Capital Improvement Programming	YES		Have plan
Community Development Block Grants (CDBG)	YES		No comment
Stormwater Utility Fees	YES		No comment
Development Impact Fees	YES		No comment
Authority to levy taxes for specific purposes	YES		No comment
Other: ______________			N/A

4. EDUCATION AND OUTREACH - Please identify any education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information such as school programs, StormReady, FireWise programs, environmental protection, evacuation plan, emergency preparedness, public education programs.

We currently host an annual Hurricane Town Hall, which helps community members prepare for hurricane season and any severe weather event. We have obtained our Storm Ready certification from the National Weather Service. We train regularly with our local school district with active shooter drills and training on chemical emergencies for our area. We are part of a county-wide evacuation plan.

5. PREVIOUS MITIGATION ACTIVITIES - Please list any previous mitigation activities (e.g. structural and/or planning projects or grants) that have been or will be implemented for your community. Please include the title of the project or grant along with any start or completion dates and the department or agency responsible.

Our storm sewer system is maintained and improved on a continuous basis. Additionally, we have received grants in the last five years that will allow us to make substantial improvements to our storm system. We have completed approximately 65% of our grant projects. The remaining projects are scheduled to be completed within the next three years.

American Rescue Plan

- Humble Camp Rd. Culvert Replacement (complete)
- Bay St. Extension Bridge Replacement (complete)
- 25th Ave Ditch Lining (complete)
- Ditch 50A Slope Paving (complete)
- 19th Ave Culvert Replacement (out for bids)

GLO Grant D253

- 7th Ave Drainage Improvements (complete)
- 34th St. Ditch Improvements (in design)
- Pump Station A & B Sheet piling Replacement (in construction)

GLO Grant D373

- Amburn Park Drainage Improvements (complete)
- Freeway Park Drainage Improvements (complete)
- South Point Drainage Improvements (construction to begin May 2025)
- Moses Lake Pump Station (in design)

Appendix F: Adoption Resolution

The plan will be adopted once deemed Approvable Pending Adoption by FEMA.

A copy of the signed resolution will be added once it is received.