

TEXAS LOCAL EMERGENCY PLANNING COMMITTEES: ASSESSING  
COMPLIANCE, PROACTIVITY, AND THE IMPACT OF ALL-HAZARDS  
PREPAREDNESS

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Master of Science

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by

Laura C. Bobrick

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## **DEDICATION**

This research is dedicated to the members of Local Emergency Planning Committees—first responders, emergency management professionals, chemical industry representatives, city and county employees, and private citizens—who volunteer their time and knowledge to help communities be better informed and prepared.

## ABSTRACT

Bobrick, Laura C., *Texas Local Emergency Planning Committees: Assessing compliance, proactivity, and the impact of all-hazards preparedness*. Master of Science (Homeland Security Studies), December, 2020, Sam Houston State University, Huntsville, Texas.

Local Emergency Planning Committees (LEPCs) were developed from federal environmental policy legislation in 1986 that aimed to bolster community preparedness for hazardous materials incidents. Collaboration and risk communication are fundamental to LEPCs, so there has been greater emphasis on incorporating homeland security elements into committees as part of a broader adoption of all-hazards planning. This thesis assesses compliance and proactivity for Greater Houston LEPCs to understand how LEPCs organize and operate under changing hazmat safety and security regulations and whether an all-hazards planning approach is more appropriate for the range of existing and emerging threats that communities must prepare for and more frequently expect LEPCs to help coordinate. This research explores the origins of local emergency planning and community resilience, LEPC compliance, and the impact of homeland security—including securitization theory—on community engagement and right-to-know.

The methodology is a multiphase design using surveys and document analysis to collect data on Greater Houston LEPCs' organization structure, membership, funding, and preparedness activities. Greater Houston, which includes nine counties—Austin, Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller—and 21 LEPCs, is the selected sample and the study population is all LEPCs in Texas. Data collection was impacted by COVID-19, so document analysis was used in lieu of focus groups. The survey response rate is 9.9% and the completion rate is 89.3%; 196 documents were analyzed for proactivity and compliance related themes.

Greater Houston LEPCs are a mix of well-organized and highly active, active but not highly compliant, and inactive. The LEPCs that are less active or inactive do not have any associated secondary data that suggests they are providing all-hazards planning in lieu of focus on federal requirements—they appear to simply not be doing any preparedness activities. It is unclear why some Greater Houston jurisdictions do not have functional LEPCs, but literature suggests that funding is a leading factor. Another leading factor for Greater Houston LEPCs may be a failure by local governments to ensure that LEPCs receive adequate support and promotion.

**KEY WORDS:** Local Emergency Planning Committees, Emergency management, Community preparedness, Chemical incidents, Homeland security, Regulatory compliance.

## **ACKNOWLEDGEMENTS**

I wish to thank the members of my thesis committee who have volunteered their time, expertise, and mentorship throughout this research process. My committee chair, Dr. Magdalena Denham, provided countless hours of feedback and encouragement throughout my journey in the master's program and challenged me to complete a thesis that reflects my academic and professional interests. Dr. Denham was also immensely understanding and patient with me as we navigated the challenges of conducting research during a pandemic, highlighting the importance of adaptive resilience. Dr. Nadav Morag, the committee co-chair, provided homeland security expertise and feedback from his writing-intensive courses greatly improved my ability to analyze texts more objectively. Dr. Jeremiah Asaka graciously offered his environmental security expertise and, at our first meeting, urged me to maintain a healthy work-life balance that allowed this process to be both challenging and enjoyable.

I would also like to acknowledge my husband's unwavering support and recognize the many hours he spent proofreading my work. He remains a champion of my academic and professional advancement, and his encouragement throughout this program and research made the experience much more fulfilling.

## **PREFACE**

This research is the result of my role as a safety and security professional within the chemical industry and my personal involvement with a Local Emergency Planning Committee. Living in the energy capital of the world, near the Texas Gulf Coast, and having experienced multiple devastating hurricanes and chemical manufacturing disasters motivated me to examine community and private industry preparedness efforts. LEPCs and their fundamental right-to-know objective puts them squarely at the center of the nexus between homeland security, emergency management, and environmental protection. Reviewing numerous recent high-profile chemical incidents in the Gulf Coast suggested that LEPCs are vital organizations, but that it was unclear how much value they provide in better preparing communities for hazardous materials incidents.

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## **CHAPTER I**

### **Introduction**

Two chemical incidents between 1984 and 1985, the gas leaks in Bhopal, India, in December 1984 and in Institute, WV, in August 1985, laid the groundwork for sweeping industry reforms and government regulations regarding chemical manufacturing safety management (Belke & Dietrich, 2005). The chemical industry had historically responded to major incidents by introducing programs that address management system weaknesses ahead of anticipated government regulation in an effort to have control over standards and requirements. In March 1985, the Chemical Manufacturer's Association (CMA) rolled out the Community Awareness & Emergency Response (CAER) program, designed to improve organizational structures, management systems, and process safety (Belke & Dietrich, 2005). Prior to passage of the Emergency Planning and Community Right-to-Know Act (EPCRA), CAER Community Advisory Panels, comprised of local leaders and educators, emergency responders, and residents, were educating communities on chemical hazards.

The CMA later adopted the Responsible Care program as a membership requirement in the United States, so by 1988 most large chemical manufacturers were operating in accordance with extremely hazardous substances (EHS) guidelines that focus on management systems (Belke & Dietrich, 2005). By CMA's own admission the program was launched because "the industry had no choice" (Siegel, 2003, p. 348). The Responsible Care program remains a requirement for the CMA (renamed the American Chemical Council or ACC since 2000) members as part of the industry's efforts to (a) improve process safety management; (b) reduce the hazards associated with chemical

distribution, transportation, and storage; (c) appropriately train employees on EHS risks; (d) prevent pollution; (e) safely manage chemical products over the course of manufacturing, safe handling, distribution and sale, recycling, and disposal. In response to the 9/11 terrorist attacks, the ACC added a Security Code to Responsible Care that addresses physical security, including site vulnerability assessments (Belke & Dietrich, 2005, p. 378).

Environmental policy has been the foundation for chemical hazardous management, starting with a more authoritarian enforcement approach before evolving to what Matheny (2012) calls participatory regulation. Participatory regulation intends for community stakeholders to collaborate to best determine how to achieve compliance rather than having federal government agencies direct regulatory activities (Matheny, 2012). Lindell and Perry (2001) identify the EPCRA as a major shift in federal emergency preparedness legislation as it was the first time that the federal government was implementing regulations without direct involvement. For nuclear attack and nuclear power plants and, later, natural hazards, federal agencies managed the planning programs, but the EPCRA represented decentralized regulation with a bottom-up approach that is oriented locally (Lindell & Perry, 2001; Matheny, 2012). While the Environmental Protection Agency (EPA) enforces laws for clean water, hazardous materials (hazmat) transportation, resource conservation and recovery, and chemical facility security, the EPCRA is somewhat unique because uses a bottom-up approach that is less about enforcing standards and more focused on information availability and community partnerships (Matheny, 2012). Signed into law by President Reagan on October 17, 1986, the EPCRA (also known as the Superfund Amendments &

Reauthorization Act [SARA], Title III) mandated that the federal, state, and local governments, and private industries collaborate on emergency planning for hazardous and toxic chemicals. The EPCRA is organized into three sections—Emergency Planning and Notification, Reporting Requirements, and General Provisions—with four major provisions that address emergency response plans (ERPs), emergency release notifications to the public, chemical inventory and storage reporting requirements, and right-to-know requirements (Blackwood, 2003; Siegel, 2003).

On October 17, 1986, President Ronald Reagan signed the EPCRA into law, giving states six months to designate a State Emergency Response Commission (SERC), which was tasked with formalizing emergency planning at a local level and developing procedures to manage public information requests, including the designation of an information coordinator (IC) (EPA, 2019b). States were given nine months from the establishment of the EPCRA for their SERCs to create emergency planning districts, from either existing jurisdictions or multijurisdictional organizations, that would develop and execute emergency plans for their respective communities (EPA, 2019, para. 1). Once emergency planning districts were designated, SERCs had 30 days to appoint Local Emergency Planning Committees (LEPCs) members, including, at a minimum, representatives from the following community stakeholders: “elected state and local officials; law enforcement, civil defense, firefighting, first aid, health, local environmental, hospital, and transportation personnel; broadcast and print media; community groups; and owners and operators of facilities subject to the requirements of this subtitle” (Belke & Dietrich, 2005; EPA, 2019b, para. 1).

In Texas, counties are designated as emergency planning districts, so each county is responsible for identifying a local government employee to serve as the LEPC liaison to the SERC (Trefz, Bierling, & Williams, 2019). However, additional LEPCs are frequently established across metropolitan centers or areas with a large concentration of chemical facilities as there are no legal limits to the number of LEPCs permitted to organize so long as they meet EPCRA reporting requirements. The Texas Disaster Act of 1975 is a key piece of state emergency management legislation that integrated state and local civil-defense functions and gave local government broader authority to manage natural disasters with the requirement that each local jurisdiction develop emergency management plans (Bea, Runyon, & Warnock, 2005). Emergency Management Directors, who are county judges and municipal mayors, are responsible for maintaining these plans as part of their emergency management authority, so Texas LEPCs do not maintain their own emergency plans as intended by the EPCRA (Trefz et al., 2019). However, Texas LEPCs are frequently included in reviewing and updating jurisdictional plans, and are often responsible for managing the section Annex Q: Hazmat Response. The Texas Department of Emergency Management (TDEM) provides an ERP template, so plans are easy to develop and consistent across jurisdictions. To fulfill these preparedness and response requirements most Emergency Management Directors will appoint an Emergency Management Coordinator (Bea et al., 2005). LEPCs must be led by a chairperson and operate in accordance to written rules that outline the procedures for public notification of LEPC activities, public meetings regarding emergency plans, receiving and responding to public comments, and distributing the emergency plan to the community (EPCRA, 2019b, para. 2).

In the 1990s, focus shifted from concerns about aging infrastructure that arose during the Cuban Missile Crisis to research about the national security vulnerabilities presented by a lack of infrastructure protection (Lewis, 2014; O'Rourke, 2007). The Chemical Sector is one of 16 critical infrastructure sectors identified in Presidential Policy Directive 21 (PPD-21) because its assets, systems, and networks are vital to the U.S. economy and national security (DHS, 2019, para. 1). Between 1997 and 2003 the number of sectors designated as critical infrastructure by the federal government increased from eight to 13 until changing in 2013 to 16 critical infrastructure and key resource sectors (Lewis, 2014). O'Rourke (2007) describes critical infrastructure hardening and recovery abilities as contributing factors to resilience since key assets like chemical manufacturing are often vital to a community's economic security and provide other resources beneficial to its social fabric.

Throughout 2019, the Texas Gulf Coast experienced five significant chemical incidents that included one fatality, which is considered "an unacceptable trend" by Toby Baker, Executive Director of the Texas Commission on Environmental Quality (TCEQ) (Kennedy, 2019, para. 8). This is only six years after arson caused a fertilizer plant explosion in West, Texas, which killed 15 people and damaged or destroyed 500 buildings. While the West incident prompted environmental activists and many citizens to again question whether enough is being done to make chemical manufacturing safer and prepare residents living near industrial areas, others turned their attention back to critical infrastructure vulnerability and homeland security efforts to prevent terrorism (Martin, 2019, para. 11).

The Houston-The Woodlands-Sugar Land Metropolitan Statistical Area (Houston MSA or Greater Houston) includes nine counties—Austin, Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller—and 21 LEPCs, as represented by Figure 1. The Houston MSA is the fifth most populous MSA in the United States with a population of 6.77 million (Greater Houston Partnership, 2019).

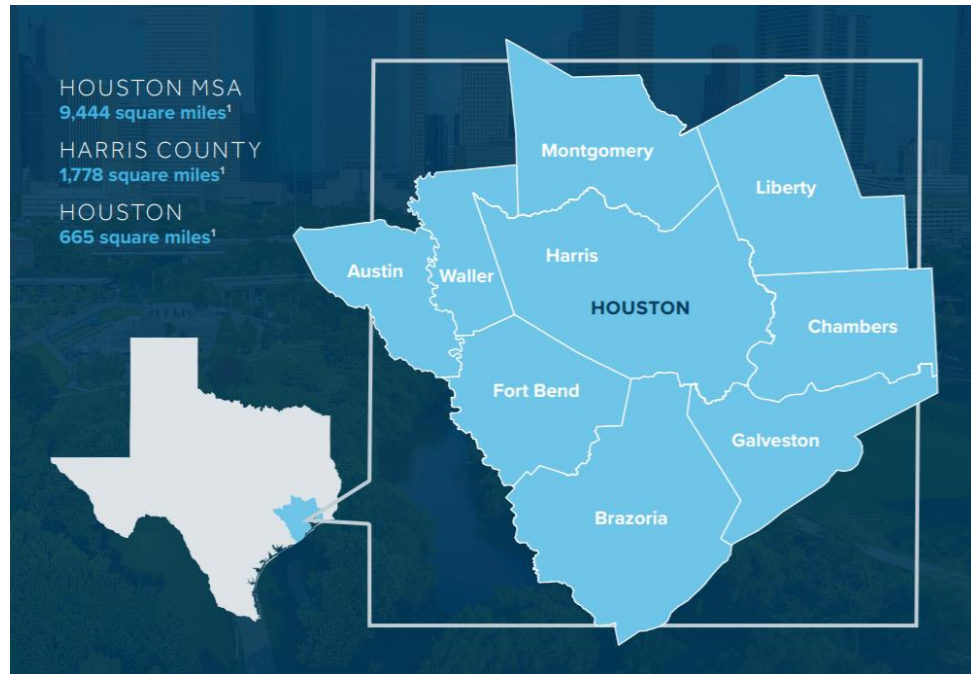


Figure 1. Houston MSA. From Houston Facts, by Greater Houston Partnership, 2019, <https://www.houston.org>

Population varies considerably among the counties, which is reflected in the number of LEPCs established for each county. For example, four counties (Austin, Chambers, Liberty, and Waller) each have fewer than 100,000 residents while Brazoria, Fort Bend, Galveston, Harris, and Montgomery Counties all have more than 300,000 residents; Harris County includes 4.6 million (Greater Houston Partnership, 2019). Harris County has 12 LEPCs representing its cities and industrial areas, Chambers County has

two LEPCs, including one interjurisdictional LEPC between the County and City of Baytown, and the remaining counties each have one LEPC. Some LEPCs in Harris County have consolidated meetings, but they continue to do compliance reporting and review ERPs for their local emergency planning districts. All LEPCs in the Houston MSA receive guidance on compliance requirements from TDEM, which is one of a dozen state agencies that perform the functions and obligations of a SERC. Other members of the Texas SERC include, but are not limited to, Texas A&M Forest Service, TCEQ, Texas Department of Public Safety, Texas Department of Transportation, and Texas Military Department (Trefz et al., 2019). This research explores the factors that influence Greater Houston LEPCs' activities, how closely these LEPCs meet the requirements of the EPCRA, and the implications of the all-hazards emergency management approach on hazmat preparedness. Understanding how LEPCs organize and operate is critical for assessing whether Greater Houston communities are increasingly vulnerable to chemical hazards.

### **Research Questions**

The EPCRA's intention with the creation of LEPCs was to have a truly collaborative local organization to develop ERPs and keep the public informed of chemical hazards. Existing literature on LEPCs address risk communication, organizational characteristics, proactivity and compliance, and homeland security. Compliance is a scaled rating determined by whether or not LEPCs are completing EPCRA requirements and to what extent (Adams, Burns, & Handwerk, 1994; Starik, Adams, Berman, & Sudharsan, 2000). Proactivity is measured by what actions a LEPC takes beyond compliance requirements (Starik et al., 2000). Multiple nationwide, state,

and regional studies have been conducted to determine levels of LEPC proactivity and compliance (Blackwood, 2003; EPA, 2008; Matheny, 2012; National Association of SARA Title III Program Officials [NASTTPO], 2016). This study supplements existing research on LEPC effectiveness and compliance (Blackwood, 2003; Lindell, 1994; Lindell & Meier, 1994; Lindell & Perry, 2001; Matheny, 2012) by exploring how closely Greater Houston LEPCs reflect broader observations on community planning and chemical incident response, and whether national, local, and industry events help drive the direction of focus. The following questions are addressed in this study:

1. To what extent do Texas LEPCs currently meet the EPCRA requirements for chemical incident preparedness and communicating chemical hazards to the public?
2. What are the implications of all-hazards planning on EPCRA compliance and proactivity?

### **Research Objectives and Significance**

There are 570 chemical manufacturing plants in the Houston MSA as of 2018, employing 38,900 or 17.3% of the overall manufacturing workforce (Greater Houston Partnership, 2019, p. 16). These chemical plants produce 44.2% of the nation's total capacity for six base petrochemicals – butadiene, ethylene, propylene, benzene, xylenes, and toluene – used to make plastics and resins. Additionally, petroleum refining in the Houston MSA produces 13.8% of the nation's total capacity across 10 refineries, or 2.6 million barrels per calendar day. Overall, there are 9,204 people employed in 40 firms in petroleum refining. These demographics are important to consider for community preparedness stakeholders and the relationship between the public and private sectors in

emergency management. In 2017, the most recent year for which the EPA has Toxic Release Inventory (TRI) data, the Houston-The Woodlands-Sugar Land metropolitan area had 520 regulated facilities with an overall total on-site disposal or other releases of 79.6 million pounds of production-related waste (EPA, 2019a). Of the nearly 80 million pounds of waste, 16.8 million pounds were released into the air and 5.5 million pounds into the water (EPA, 2019a). In 2014, the Houston MSA ranked 2 out of 893 urban areas based on the highest release per square mile and 3 out of 893 urban areas in 2015 (EPA, 2019a).

Assessing compliance and proactivity for Greater Houston LEPCs is valuable to understanding (a) how LEPCs organize and operate under changing hazmat safety and security regulations; (b) what influence both major disasters or emergencies like 9/11 and the West explosion and incidents like the spate of chemical releases in Greater Houston in 2019 have on LEPC activities; (c) whether an all-hazards planning approach is more appropriate for the range of existing and emerging threats that communities must prepare for and more frequently expect LEPCs to help coordinate. The results of this study will provide a snapshot of current LEPC compliance, proactivity, challenges, and limitations, and illustrate how LEPC performance can vary across metropolitan areas, states, and the nation.

## **Organization of Research**

Chapter One introduces LEPCs and offers context in terms of environmental policy and emergency management in the United States and for chemical manufacturing in the Greater Houston area. The first chapter details the research questions, objectives, and significance of conducting research on compliance and proactivity for LEPCs in the

Greater Houston area. Chapter Two discusses the relevant literature on LEPCs, drawing from research and discussion on the history of emergency management and environmental policy in the U.S., LEPC organizational characteristics and activities, and homeland security impacts. Chapter Three explains the study design, including methods and the instrumentation used to collect information, the impact of the coronavirus (COVID-19) pandemic on data collection, and limitations to the research. Chapter Four is a discussion of the survey results and document analysis. Chapter Five addresses the study findings in the context of the research questions and hypotheses, provides conclusions from the study findings and their relationship to existing literature, and offers suggestions for future research.

## **CHAPTER II**

### **Literature Review**

The literature review in this chapter presents an overview of the major themes of this research: community preparedness, homeland security, and right-to-know. Prior to examining literature on LEPCs I completed research on literature review processes. Galvan (2006) organizes the literature review process around a detailed series of steps that is helpful for understanding what the final product should look like and how to get there in small increments. These include identifying the overall problem, explaining why the topic is worthy of research, identifying body of works that are research versus other information, and justifying why some studies have significant value (Galvan, 2006, p. 90). My approach was to start searching broadly for literature on the major themes then narrowing it down to specific concepts that highlight the relationship between each, with consideration for the strengths and weaknesses of each piece of research.

My literature review search began with a Google Scholar search for “Local Emergency Planning Committee,” “LEPC,” and “community preparedness for chemical incidents.” Since I was already aware that the majority of research on LEPCs was conducted within the first 10 years of the EPCRA being passed I put no date range restrictions on my search. For community preparedness I was interested in research before 9/11 and after to look for changes in management approaches and frameworks. Where an article was not available via open access, I used SHSU’s Engine Orange to download it or requested it directly from the author(s) on ResearchGate. After reviewing each article’s abstract and references I would add it to my literature review spreadsheet, called a Conceptual Synthesis Excel Dump by Pacheco-Vega (2017), which identifies

literature I have reviewed by author, themes, relevancy to my own research scope, and any other key pieces of information. The Conceptual Synthesis Excel Dump is available in the Appendix section.

The field of research on LEPCs is narrow and the majority of literature is based on studies conducted by a handful of anchor authors—M.K. Lindell, R.W. Perry, and D.J. Whitney. Pacheco-Vega (2017) describes anchor authors as researchers whose articles serve as the foundation of the current research being conducted. Matheny (2012) and Blackwood (2003) are two of only three doctoral dissertations on LEPCs that I found, so their literature reviews were valuable for citation tracing; by identifying which authors were cited in more recent LEPC research I could establish the relationship between researchers and key concepts (Pacheco-Vega, 2016). The literature review process revealed that most research on LEPCs can be categorized as either periodic performance surveys (Adams et al., 1994; Conn, Owens, & Rich, 1990; EPA, 2008; NASTTPO, 2016; Starik et al., 2000), evaluations of environmental policy (Belke & Dietrich, 2005; Chekouras, 2007; Lindell & Perry, 2001; Siegel, 2003), community preparedness assessments (Blackwood, 2003; Lindell, 1994; Lindell & Meier, 1994; Matheny, 2012), or exploration on LEPC organizational effectiveness (Lindell & Whitney, 1995; Lindell, Whitney, Futch, & Clause, 1996; Whitney & Lindell, 2000). Lindell (1994), Lindell and Meier (1994), Lindell and Whitney (1995), Lindell and Perry (2001), Perry and Lindell (2003), and Whitney and Lindell (2000) are repeatedly cited in all research on LEPCs, which is how I determined concept saturation or the exploration all relevant literature for LEPCs (Pacheco-Vega, 2016).

## **Main Themes**

The main themes of my literature review— community preparedness, homeland security, and right-to-know—are taken directly from the specific research questions I identified earlier. From these I can identify theory that must be considered in the context of the reviewed literature and my own proposed research. These main themes also help me stay focused on a narrow topic by always asking whether a body of research directly or indirectly addresses any of the themes. The first section details the origins of local emergency planning in the broader historical context of emergency management development in the United States. The second section reviews LEPC activities and characteristics that directly contribute to EPCRA requirements regarding ERPs and information sharing. The third section details the influence of homeland security on emergency management and right-to-know.

## **From Civil Defense to Community Planning**

The evolution of emergency management over the last 100 years is marked by catastrophic disasters, groundbreaking legislation, and society's changing demands of the role of the federal government in assisting civilians before, during, and after times of crisis. The national threat matrix has expanded to include hazards that were never even considered possible 30 years ago. Rubin (2015) classifies disasters as natural (hurricanes, tornadoes, etc.), man-made accidental (Three Mile Island, Deepwater Horizon spill, etc.), and man-made intentional (9/11 attacks and West explosion). Natural and manmade accidental disasters have intensified and continue to cause significant damage despite improvements in emergency management and medical care, as well as technological advancements. As the federal government has grown into a vast bureaucracy of agencies

and departments that govern America, so has emergency management in many ways. Emergency management's organizational structure and functional role in the 21st century is a result of lessons learned and in anticipation of future incidents that require complex solutions in planning and response.

Rubin (2015) identifies three features that have greatly contributed to or affected the evolution of American emergency management: the historical participation of the federal government, the influences behind increased expectations of government support, and political backlash that resulted from Hurricane Katrina and the Deepwater Horizon oil spill. Events like the 9/11 attacks, Hurricanes Katrina, Rita, and Wilma, the Deepwater Horizon spill, and Superstorm Sandy are considered focusing events, because they highlight massive policy failures and reveal knowledge gaps in preparedness (Birkland, 2009; Rubin, 2015). World War II ushered in a new way to think about disasters and what hazards posed legitimate threats to American communities. As the nation became increasingly concerned about air raids and bombing attacks from the Japanese the federal government created civil defense programs that focused on warning and alert systems, public information, rescue units, and shelter management (Rubin, 2015; Blanchard, n.d.). The Federal Civil Defense Act (FCDA) of 1950 authorized the federal government to develop plans and programs, provide guidance, fund equipment, and design warning systems for civil defense while keeping the ultimate responsibility with state and local agencies (Rubin 2015). The Federal Disaster Relief Act was also passed in 1950 as a means of providing federal equipment, manpower, and supplies assistance to affected areas in support of local response efforts (Rubin, 2015). Current emergency management policies are still centered on this fundamental tenet that disasters

and emergencies should be managed at the lowest possible level of authority. Local planning is defined by Lindell and Meier (1994) as activities performed to meet the objectives necessary to achieve EPCRA compliance. For LEPCs this means that organization structure, activities, and effectiveness can vary greatly between and within states based on state and local governments, funding sources, and community demographics. Lindell and Meier (1994) use disaster planning, strategic planning, and team effectiveness to gauge the overall effectiveness of a LEPC.

The 1960s marked a pivotal shift in disaster planning as concern for natural and technological threats emerged, prompting the integration of more hazards into disaster planning, and preparation for nuclear attack was no longer considered a one-size-fits-all approach (Blanchard, n.d.; Quarantelli, 2000). Quarantelli (2000) found that civil defense programs at the national level drove civil protection systems at the local level. Most notably, this period was defined by a shift in disaster planning that focused on national security to focus on strengthening local communities (Dynes & Quarantelli, 1977). The dual-use preparedness approach was introduced in the 1970s to encourage community planning for more common and frequent disasters as a way to harden them for nuclear attacks (Blanchard, n.d.). Dynes and Quarantelli (1977) noted that local civil defense office operations varied considerably depending on how the threat of nuclear attack was prioritized in comparison to other manmade hazards or natural disasters.

This observation also applies to LEPCs where planning may include consideration for multiple hazards and communities emphasize different aspects of risk management. The TDEM incorporates risk reduction measures and emergency response to non-chemical incidents in guidance issued to LEPCs. Hazardous materials in oil and gas

operations—production, shipping and pipelines, and refining—also pose substantial risks to communities and many rural areas LEPCs have few or no facilities regulated by the EPCRA (Becknel, 2019). All-hazards planning was introduced in 1980 as emergency management transitioned away from the dual-use approach and the communities were increasingly concerned with natural disasters (Blanchard, n.d.). The newly created Federal Emergency Management Agency (FEMA) incorporated the all-hazards approach into their Integrated Emergency Management System (IEMS), which provided preparedness and response capabilities for every level of government and any type of disaster by maintaining a flexible framework (Blanchard, n.d.). However, Birkland (2009) argued that the ineffective response to Hurricane Katrina was a notable failure because it suggested that the sweeping changes made to emergency management after 9/11 were largely useless, especially for a mass casualty incident (Birkland, 2009).

Waugh (1991) attributes the benefits that LEPCs provide as an emergency management function to their decentralized design and posits that the closer an organization or function is to the local hazards it supports the fewer operational barriers it faces. LEPCs have the flexibility to adapt to their respective community's needs since communication remains local and logistics are coordinated horizontally across agencies and organizations, rather than vertically through local, state, and federal governments (Waugh, 1991). Analysis of the federal emergency management structure in the U.S. revealed that accurate interpretation of the issues associated with an incident or disaster and the ability to effectively allocate resources are highly dependent on the decision-making individuals' or agencies' proximity to the area impacted (Waugh, 1991, p. 4). While there is no available literature detailing if and how LEPCs have responded to non-

chemical incidents in a community, their structure is conducive for improvisation and adopting new responsibilities. While organizational hierarchy may vary between individual LEPCs based on how leadership roles are determined and to what degree membership is actively engaged, they remain more horizontally integrated than traditional command and control agencies within emergency management.

### ***The EPCRA***

Environmental and industrial safety legislation in the 1970s included the Occupational Safety and Health Act, Clean Water Act, Hazardous Material Transportation Act, Resource Conservation and Recovery Act, and Toxic Substances Control Act (Lindell & Perry, 2001). A precursor to the EPCRA was the Chemical Emergency Preparedness Program (CEPP), which was a voluntary EPA program that encouraged state and local authorities to create ERPs for chemicals hazards that they would identify in their respective areas (Siegel, 2003). The CEPP's goal was to protect public health, safety, and the environment by preventing chemical accidents, but it lacked federal and state guidance (Lindell & Perry, 2001). With no corresponding legislation the EPA could not legally enforce the CEPP, so the following year Congress used the CEPP as the framework for the EPCRA (Blackwood, 2003; Siegel, 2003). Most communities lacked the resources and expertise to conduct vulnerability assessments on the chemical hazards present or implement an appropriate strategy to manage the risks, which is why the EPCRA expanded on the CEPP to develop a mandatory program requiring stakeholder participation and public communication (Lindell & Perry, 2001). LEPCs would be the designated organization within a community to conduct vulnerability assessments, formulate a strategy, and implement the strategy for managing chemical

emergency response and public risk communication (Lindell & Perry, 2001, p. 170).

Lindell and Perry (2001) identify the EPCRA as a major shift in federal emergency preparedness legislation as it was the first time that the federal government was implementing regulatory requirements without direct involvement. For nuclear attack and nuclear power plants and, later, natural hazards, federal agencies managed the planning programs, but the EPCRA represented decentralized regulation with a bottom-up approach that is oriented locally (Lindell & Perry, 2001; Matheny, 2012).

The EPCRA formalized and streamlined many of the best practices already performed by state and local governments—public disclosure regarding hazmat production, use, and storage at facilities, local disaster planning councils, and collaboration between fire departments and hazmat handlers to develop effective response plans (Lindell & Perry, 2001, p. 171). It requires chemical facilities to release information on the type and quantities of extremely hazardous substances manufactured, used, or stored onsite and then that the newly established SERCs and LEPCs be available to receive, evaluate, and respond accordingly (Lindell & Perry, 2001). Lindell and Perry (2001) outline the steps of chemical hazard management process that begins by (a) identifying EHS data; (b) conducting a vulnerability assessment; (c) developing a strategy; (d) implementing the strategy; (e) reducing risk. Once EHS information is acquired risk communication complementary to the strategy is developed and the community is educated and mobilized as party of the strategy implementation. The EPCRA does not require LEPCs to include the public when collecting EHS data from chemical facilities or conducting vulnerability assessments, but Lindell and Perry (2001) note that the law intends for the community to be engaged once ERPs exist so that risk

communication can be used to bolster community support to execute and maintain the hazard management strategy.

### ***Community Resilience***

LEPCs are a vital institution that serve communities by linking residents to private industry and government agencies before, during, and after hazardous incidents. Contrary to popular myth, disasters are not equal opportunity events that impact a community uniformly. Government and industry definitions of resilience vary, but the concept primarily refers to an individual's, community's, or system's ability to adapt, withstand, and recover from a change in conditions brought upon by disaster (Ross, 2014, p. 75). However, resilience does not mean that an entity, in this case a community, will remain unchanged or without impact throughout the process, but rather that it possesses the capabilities to endure and resume (Kahan, Allen, & George, 2009). Resilience is nuanced for both communities and individuals – some systems may bound back quickly while others struggle to recover long-term. Resilient infrastructure in both physical and social systems must maintain robustness, redundancy, resourcefulness, and rapidity (O'Rourke, 2007). Increasing resilience is the primary goal because significant financial limitations exist for fully hardening and securing critical infrastructure (Lewis, 2014). Tightly connected infrastructure that lacks resilience is more vulnerable to producing catastrophic effects (Birkland, 2009; Lewis, 2014). Lewis (2014) points to networks and the hidden links among physical and social system as vulnerabilities that cause minor incidents to evolve into disasters because failing to identify connectedness leads to unanticipated cascading consequences. Birkland (2009) suggests that community

resilience can be strengthened with an all-hazards planning approach for training, mitigation activities, intergovernmental collaboration, and risk communication (p. 433).

Resilience increases proportionally with a community's availability of resources and degree of adaptive capacity (Longstaff, Armstrong, Perrin, Parker, & Hidek, 2010, p. 5). Resources are measured by their performance, diversity, and redundancy, which is where exercises contribute to resilience (Longstaff et al., 2010). Simply having a large pool of resources is insufficient if they are not robust, high-quality, and valuable.

Institutional subsystems that provide emergency management services need equivalent competency across agencies, joint preparation, and adaptive decision-making to manage disasters and catastrophes that stress the limits of a system's capital (Boin & McConnell, 2007; Kahan, 2015b). A community's adaptive capacity depends on the pre-disaster condition of subsystems—institutional, individual and social, infrastructure, and economic—which may provide either barriers or advantages to “prevent, withstand, and manage a disaster” (Ross, 2014, p. 94). Barbour, Bierling, Sommer, and Trefz (2020) suggest that LEPCs build community resilience for hazmat incidents because they serve as cross-sector, interorganizational networks that connect stakeholders; these cooperative relationships would otherwise likely not exist. LEPCs contribute to community robustness by providing emergency operations planning and people-oriented preparedness for the chemical sector. Community stakeholder participation and risk communication are two vital LEPC activities that also exist within critical infrastructure protection. O'Rourke (2007) identifies awareness, leadership, resource allocation, and planning as four ways to promote resilience within a community, which are similar to

attributes identified in effective and proactive LEPCs that are discussed later in this paper.

Social capital—bonding, bridging, and linking—describes the connections between individuals in a community and how these relationships impact adaptive capacity. Barbour et al. (2020) note that LEPCs should produce social capital through their opportunities for community dialogue among a broad-based membership and with the requirement that all meetings are open to the public. Bonding connections describe emotional relationships between family and friends, based on similarities that allows individuals to maintain resilience because they have a network available to provide immediate resources before a disaster and assistance following (Aldrich & Meyer, 2015). Bridging connections are with social groups (political and civic, church, sports, etc.) that provide institutional support and long-term recovery assistance. Bridging social capital allows individuals to form relationships that might otherwise not be accessible; this can include meeting people from other ethnicities and socioeconomic backgrounds (Aldrich & Meyer, 2015). Linking social capital allows individuals to access people in power across government and other institutions of authority. This connection does not need to be direct and is often through formal channels or intermediaries with bonding or bridging capital; leaders must forge strong links with the community to maintain trust, which is essential to emergency management (Aldrich & Meyer, 2015; Kahan et al., 2009). LEPC meetings provide an opportunity for residents to strengthen linking capital with local government, first responders, and the chemical industry in an environment designed to promote collaboration and information transparency between all community stakeholders (Barbour et al., 2020). Linking capital is weaker than bonding or bridging capital due to

accessibility barriers with people in institutions of power, particularly for vulnerable populations. As discussed later in this chapter, imbalances in social capital also reinforce the need for robust protections to right-to-know laws that empower residents to access vital information on community hazards without undue influence from local authorities.

### **LEPC Characteristics and Activities**

The EPCRA required governors to each establish a State Emergency Response Commission that was tasked with creating Local Emergency Planning Committees for approximately 3,500 of the nation's local emergency planning districts, with membership that includes (a) fire departments; (b) law enforcement; (c) first aid; (d) EPCRA regulated industries and facilities; (e) elected local officials; (f) elected state officials; (g) health; (h) media; (i) hospitals; (j) community groups; (k) environmental; (l) transportation; (m) civil defense (EPA, 2019b). Adams et al. (1994) outlined 10 EPCRA elements that serve as the foundation of most LEPC research on compliance, activity and effectiveness:

1. Have a LEPC Chair.
2. Have an Emergency Coordinator.
3. Have an Information Coordinator.
4. Have representation from at least 12 of 13 specified groups.
5. Hold formal LEPC meetings.
6. Notify the public of meetings.
7. Develop and submit an emergency response plan to the SERC
8. Have a plan incorporating at least 9 of 10 SARA Title III elements.
9. Review the emergency response plan annually.

10. Within the past year, published newspaper notice of the public availability of the emergency response plan and local hazardous materials data.

Compliance is simply whether LEPCs are meeting any EPCRA requirements.

Local planning includes any activities that advance the organization closer to compliance, by achieving one or more of the elements (Lindell & Meier, 1994). Levels of compliance are classified by Adams et al. (1994) as “not compliant,” “mostly compliant,” and “compliant,” based on how many of the above 10 elements a LEPC fulfilled. “Not compliant” LEPCs meet between 0 and 5 elements listed above, “mostly compliant” LEPCs meet between 6 and 8 elements, and “compliant” LEPCs meet nine or ten elements (Adams et al., 1994, p. 4). The majority of subsequent research on LEPCs (e.g. Starik, et al., 2000; Blackwood, 2003; Matheny, 2012) has applied this criteria. Proactivity refers to any effort by LEPCs beyond compliance requirements (Starik et al., 2000). Five criteria developed by Adams et al. (1994) for LEPC proactivity are as follows (p. 5):

1. Has practiced the emergency response plan in the past 12 months.
2. Has updated the plan in the past 12 months.
3. Has accounted for natural hazards in the plan.
4. Uses EHS data to recommend hazard reduction or prevention strategies to local government or industry.
5. Meets quarterly or more often.

The above activities are not achievable without well-structured and effective organizations. Blackwood (2003) states that sometimes effectiveness can be measured just from reviewing a LEPC’s required task completions, like the development of an ERP

that was approved by SERC. However, Lindell and Perry (1990) measure LEPC effectiveness with much more comprehensive criteria that peels back the layers of an organization to explore what factors are actually behind the successful completion of required tasks and other activities. This is the difference between strategic and operational frameworks, and task completion is not something that sustains or advances organizations' long-term goals or viability. Lindell and Meier (1994) use disaster planning, strategic planning, and team effectiveness to measure overall LEPC effectiveness. Strategic planning considers the dimensions that contribute to the entire organizational process and addresses internal and external dynamics that drive decision making (Lindell & Meier, 1994).

Lindell et al. (1996) state that team climate, LEPC leadership, and workgroup cooperation are organizational characteristics that influence effectiveness by building pride, showing commitment to goals, and motivating members (p. 198). The aspects of team climate, defined as "members' interpretations of events and processes that take place in their work environment," include the stress of the role, rewards for activities, leadership qualities, and workgroup dynamics (Lindell et al., 1996, p. 198). Leaders who emphasize goals and provide support for achieving them are important qualities that strengthen team climate and increase participation in LEPCs (Whitney & Lindell, 2000). Assigning roles in LEPCs without clearly defined responsibilities can diminish motivation, cause team conflict, or lead to burnout attempts to take on too many tasks. Activities should clearly link to the organization's stated objectives, with understanding of how they support the broader goals of compliance. Team climate drives more effective planning by motivating members to buy into the organization's goals (Lindell &

Whitney, 1995; Whitney & Lindell, 2000). Healthy, supportive team climates are associated with job satisfaction and organizational commitment, which strengthen LEPC member participation by encouraging attendance and similar efforts as those of the leadership team (Lindell et al., 1996). Other factor contributing to LEPC effectiveness are community support and resources, attention from community groups and local government officials, and hazard vulnerability (Lindell et al., 1996; Whitney & Lindell, 2000). Rogers et al. (2010) measured active member demographics and found that fire and emergency management officials participated in over 90% of LEPCs and Tribal Emergency Planning Committees (TEPCs) surveyed, followed by law enforcement in over 80%, and elected officials, industry representatives, and public health in more than 70%. Participation from environmental groups, state officials, and transportation carriers was reported in between 20 and 40% of responding committees; Rogers et al. (2010) note that these overall member demographics are consistent with the EPA's 2008 nationwide survey. Whitney and Lindell's (2000) more recent study did not identify a significant relationship between member participation and LEPC effectiveness in their survey of 57 Michigan LEPCs. Existing literature does not explain this finding, but it is worth considering how the composition of LEPC leadership and having paid staff versus volunteers influence effectiveness. LEPC leadership comprised of more government and industry employees may be able to fulfill compliance requirements regardless of membership participation than a LEPC led by residents or community group leaders. In that regard, having paid staff could be inconsequential since regulated facilities and local emergency responders have to participate in LEPCs.

The broad interpretative range of the EPCRA's mission is partially responsible for why all LEPCs manage compliance differently and effectiveness is measured against whatever objectives a member thinks meet the mission (Lindell et al., 1996). While the majority of responses named community hazard awareness and emergency planning, others stated hazard vulnerability identification, providing communities with worst case scenarios from chemical inventories, and managing right-to-know information requests (Lindell et al., 1996). If members struggled 25 years ago to explain EPCRA mission conceptualization, it is worthwhile to consider how the distance of time since its passage has further diluted understanding. All-hazards planning may introduce additional confusion, especially if members are unclear on how it complements the mission. Lindell et al. (1996) further found that LEPCs struggle to establish actionable goals and determine how to achieve them. This is associated with the strategic planning that Lindell and Meier (1994) note is useful for measuring effectiveness.

A key benefit of LEPCs is their development of ERPs and guidelines for their communities to follow in the event of a chemical incident, but infrequent practice renders plans useless (Matheny, 2012). LEPCs members have expressed concern that the existence of an ERP gives the community a false sense of security if resources and systems do not exist to implement the plan's objectives and train all responding personnel (Lindell et al., 1996, p. 206). Updating and exercising ERPs are good indicators of emergency preparedness and the majority of LEPCs have used their ERP in an exercise (Matheny, 2012; NASTTPO, 2016). Exercises are a tool for strengthening resilience when they test the decision-making competencies and collaboration of a whole community because they validate capabilities (Trefz et al., 2019). Institutional

subsystems that provide emergency management services need equivalent competency across agencies, joint preparation, and adaptive decision-making to manage disasters and catastrophes that stress the limits of a system's capital (Boin & McConnell, 2007; Kahan, 2015b). Boin and McConnell (2007) found that eliminating barriers at personal, organizational, and institutional levels can enhance resilience. Individual response dysfunctions to future threats, organizational rationalizations of failures, and flawed institutional designs that cannot rapidly respond to critical breakdowns must be challenged in exercise scenarios (Boin & McConnell, 2007, p. 56).

Regularly scheduled meetings, diverse and dedicated membership affiliation, and consistent attendance are positive drivers of LEPC performance (EPA, 2008; Matheny, 2012). Lindell (1994) noted that how LEPCs organize, their leadership and team dynamics, and member commitment are just as critical to effectiveness as front of house operations like hazmat teams, vulnerability assessments, and emergency response resources (p. 178). As important as membership commitment is the actual number of members involved in a LEPC, since more people allow for more activities, participation, and member dues (Lindell and Meier, 1994). Rogers et al. (2010) survey of LEPCs and TEPCs in 36 states found that 39% met quarterly and approximately 35% met bi-monthly or monthly. A 2012 statewide survey of Ohio LEPCs found that 80% of responding LEPCs met at least quarterly, but in a 2016 nationwide survey only 51% of responding LEPCs held quarterly meetings (Matheny, 2012; NASTTPO, 2016). Blackwood (2003) posits that the number of meetings held is a reflection of the workload and activities being managed by LEPCs and that meeting frequency will increase when compliance items are being tasked.

Lindell (1994) found that most local emergency planning districts studied failed to fully comply with EPCRA requirements, but that some of that can be attributed to the increased compliance standards under the EPCRA compared to previous hazard mitigation initiatives. A 2008 LEPC survey conducted by the EPA concluded that despite the emerging challenges facing emergency management after the events of 9/11, LEPCs continue to provide valuable and positive efforts toward chemical safety in communities across America (EPA, 2008). According to Matheny (2012), Ohio LEPCs generally meet the expectations and standards developed by the EPCRA, but struggled with public notification requirements (p. 112). However, nationwide and state-specific research on LEPCs can be difficult to draw accurate generalizations from due to the way planning and preparedness are guided and funded by each SERC.

In 2017, in an effort to provide strategic planning framework to LEPCs, the TDEM collaborated with Texas A&M Transportation Institute to revise and expand the Texas LEPC Handbook. Using resources from the EPA Region 6 guide and other research on LEPCs, the handbook covers LEPC compliance and proactivity criteria (Trefz et al., 2019). It is organized by module, each covering a different aspect of LEPC operations, and instructs LEPCs on what objectives need to be completed to meet the module goals and how to complete them. A series of preparedness projects were developed to offer basic, intermediate, and advanced options based on the size and abilities of a given LEPC. The TDEM classifies small, rural LEPCs as basic in terms of their projected abilities, mid-sized LEPCs and those in urban areas with a large concentration of chemical industry are intermediate, and high-functioning LEPCs in major metropolitan areas or the Gulf Coast region with significant concentrations of

chemical industry are advanced (Becknel, 2019, p. 14). The goal of these projects is continuous improvement to prevention, mitigation, and emergency response processes and planning. While LEPCs have traditionally focused primarily on response and mitigation they should be receptive to all four areas of emergency management, including preparedness and recovery (Matheny, 2012).

Waugh (1991) attributes the benefits that LEPCs provide as an emergency management function to their decentralized design and posits that the closer an organization or function is to the local hazards it supports the fewer operational barriers it faces. LEPCs have the flexibility to adapt to their respective community's needs and quickly since communication remains local and logistics are coordinated horizontally across agencies and organizations rather than vertically through local, state, and federal governments (Waugh, 1991). Analysis of the federal emergency management structure in the U.S. revealed that accurate interpretation of the issues associated with an incident or disaster and the ability to effectively allocate resources are highly dependent on the decision-making individuals' or agencies' proximity to the area impacted (Waugh, 1991, p. 4). While there is no available literature detailing if and how LEPCs have responded to non-chemical incidents in a community, their structure is conducive for improvisation and adoption of new responsibilities. While organizational hierarchy may vary between individual LEPCs based on how leadership roles are determined and to what degree membership is actively engaged, they remain more horizontally integrated than traditional command and control agencies within emergency management.

## **Homeland Security and Emergency Management**

The disaster management approach since 9/11 aims to protect critical infrastructure, reduce hazard vulnerabilities, and strengthen all-hazards response capabilities (Matheny, 2012). Homeland security as a concept and policy reintroduced the command-and-control management approach first developed during the Cold War as part of civil defense, with emphasis on manmade incidents (Alexander, 2002; Matheny, 2012). Civil defense uses restrictions as a defense against threats and values control over collaboration and information sharing since secrecy promotes security (Alexander, 2002). Homeland security is challenging to define both as a concept and policy, but in the United States it largely represents a national strategy to secure and protect the country from terrorism with missions that secure borders, enforce immigration laws, protect cyberspace, and promote disaster resilience (Kahan, 2015a). O'Sullivan and Ramsay (2015) define it as "the security and resilience of civilian domestic populations against naturally occurring and man-made threats" (p. 47), noting that homeland security theory and practice post-9/11 have been distorted, in part as a response to frequent policy changes in DHS organization structure, mission, and response. Kahan (2015a) notes that emergency management before 9/11 was an analytical process that planned and executed actions to prepare, respond, recover, and mitigate to domestic emergencies and disasters, but after 2001 it prioritized the threat of foreign terrorism. The relationship between emergency management and security is part of the larger relationship between environmental, homeland, and national security, which O'Sullivan and Ramsay (2015) argue center around the political risks associated with climate change threats. As emergency management transitioned to an all-hazards model it gave state and local

governments more responsibility and authority to manage preparedness functions and direct response operations to a variety of threats—industrial accidents, natural disasters, and terrorism—that stress critical infrastructure systems and require coordination from stakeholders at all levels of government and within the private sector (Kahan, 2015a; O’Sullivan & Ramsay, 2015).

The basis for incorporating counterterrorism measures in LEPCs is to plan for hazardous materials response that may include substances used in weapons of mass destruction. The federal government’s counterterrorism program leading up to 9/11 relied on the EPA to provide planning support, training, and hazardous materials expertise to state and local officials responding to a terrorism incident. Using LEPCs to support homeland security and counterterrorism efforts is a natural choice for the federal government for three reasons—the relationships developed by LEPCs across a community are advantageous to for planning and response to other large-scale or high-profile threats; LEPC members are from safety and security focused organizations, with varied emergency response capabilities, so their resources would be valuable; and LEPC members from chemical facilities and other hazardous materials industries can identify and report suspicious activities and educate local officials on facility security vulnerabilities (Blackwood, 2003). However, Birkland (2009) identified two flawed assumptions about the homeland security approach to emergency management—first, that local and regional authorities require greater federal oversight to correct weaknesses in response and, second, that improvements in planning would result in improvements in response (p. 428).

### *Security vs Safety*

When the Department of Homeland Security (DHS) was established and given oversight of the FEMA, it was uncertain how LEPCs would be impacted and whether they would be tasked with assisting in local homeland security programs (Blackwood, 2003). The scope was already evolving in the 1990s as LEPCs were expected to address specific threats to chemical facilities beyond accidental chemical incidents; this most commonly includes natural disasters and acts of terrorism (Blackwood, 2003). Starik et al. (2000) reported that the EPA's goal to have 50% of LEPCs incorporate counterterrorism risks into ERPs by 2005 was nearly achieved with 40.3% of active LEPCs already in compliance as of 1999 (p. 6). Blackwood (2003) found that 53% of responding LEPCs with an ERP had included a section on terrorism. After 9/11, a majority of Ohio LEPCs reported increases in emergency planning, activity level, public education, and proactivity (Matheny, 2012). A 2016 nationwide survey reported that approximately 80% of responding LEPCs perform all-hazards planning, yet 58% of responses note the lack of a free-standing ERP and only 54% of responses have an ERP that is reviewed and updated annually (NASTTPO, 2016). This raises questions about the benefits of all-hazards planning and whether there is a dilution effect for chemical incident preparedness. Perry and Lindell (2003) found that too much emergency planning post-9/11 focuses on developing written plans for various hazards, weakening the overall planning process. Birkland (2009) argues that while focusing events often reveal policy failures, they can also introduce solutions to the wrong problems because they generate such significant political pressure to make corrections (p. 424). This can also lead to the

securitization of referent objects, which is explored in a later section and serves as a theoretical foundation for much of the debate on safety versus security.

Chemical manufacturing and emergency planning in Greater Houston faced enormous scrutiny during Hurricane Harvey due to a toxic chemical release at the Arkema manufacturing plant in Crosby, Texas, between August 31 and September 1, 2017. Throughout the incident media highlighted the company's poor relationship with the community and reluctance to disclose what chemicals were kept at the facility. The Harris County Sheriffs' Office, Crosby Fire Department, and nearby residents were all unaware of what chemicals were stored, their quantities, or the hazards they presented to the surrounding communities, which is inconsistent with one of the major requirements of the EPCRA and LEPCs (Mele, 2018). Former Harris County Judge Ed Emmett noted that with chemical incidents "There are still a lot of things being viewed through the lens of 9/11," which raises questions about officials' and communities' perception of disasters and what is permissible (Dempsey & Collette, 2016, para. 12). Elected officials' focus on terrorism as a leading risk, despite evidence that other types of disasters are more frequent and consequential, is a strategic goal of terrorist organizations as it reinforces fear long after an incident and government response is resource intensive and costly (Alexander, 2002). LEPCs and emergency planners should carefully consider to what degree community preparedness for chemical incidents may suffer if local and state officials are more concerned about the political and economic consequences of terrorism.

Chemical companies must now balance the need for transparency as part of the public's right-to-know with security risks associated with having sensitive data available as open-source. Increased restrictions on information accessibility are in direct conflict

with the EPCRA and public incidents like the West explosion highlight the need for greater transparency on chemical inventory, whereas many officials see it as an example of a vulnerability to be exploited. Chemical facility risk management plans include Off-Site Consequence Analysis (OCA) that detail potential damages and harm associated with accidental release, including vulnerability zones in a community; plans, with OCA data removed, were previously searchable in an online EPA database until 1999 when the Chemical Safety Information, Site Security and Fuels Regulatory Act (CSISSFRA) was passed (Chekouras, 2007, p. 114). The public can still access OCA information, but only by making an appointment to view the printed documents at a Federal Reading Room (Chekouras, 2007). The only Federal Reading Room in Texas is at the EPA Region 6 office in Dallas. Chemical facility information was scrubbed from government websites immediately after the 9/11 attacks, including the EPA's database of ERPs for nearly 15,000 facilities in the United States (Siegel, 2003).

The desire to restrict access to information is a typical response to national security threats and is rooted in Cold War-era attitudes toward secrecy that was necessary to protect information and plans vulnerable to espionage or leaks that could escalate conflict (Alexander, 2002). Organizations with a security focus tend to operate as closed systems with limited information sharing or transparency, whereas community organizations that provide outreach and relief services are more collaborative and inclusive by nature. LEPCs that address other community hazards or emphasize counterterrorism activities risk creating an organizational culture that provides information to the public only when it is considered a need-to-know rather than a right-to-know. Limiting public disclosures may cause declines in public safety and security, in

addition to violating right-to-know laws and eroding the relationship between chemical facilities and the public (Siegel, 2003). Furthermore, right-to-know laws are a vital aspect of participatory democracy that prevent corruption or political favoritism that is often used to acquire information (Siegel, 2003).

Matheny (2012) states that for most LEPCs community-right-to-know initiatives are ignored or given low priority; only 28% of LEPCs surveyed in Ohio had given a public briefing in the last five years. Rather than keeping facilities secure James Florio, a former congressman and one of the authors of the EPCRA, argues that refusing public disclosure makes everyone less safe because facilities are no longer accountable for maintaining robust management standards and systems (Dempsey & Collette, 2016). In 2014, then-Attorney General Greg Abbott argued that the information was still readily available because “you can ask every facility whether or not they have chemicals...and if they do, they tell which ones they have” (Dempsey & Collette, 2016, para. 17). Citing the Texas Homeland Security Act, the Texas Attorney General’s office has, since the explosion in West, advised LEPCs that they are not required to make chemical facility inventories available to the public (Dempsey & Collette, 2016). It is noteworthy that the Texas Homeland Security Act had existed for a decade prior to the West explosion without ever being used to restrict the public release of chemical hazards information. In March 2020, Houston Public Media submitted an open records request to TCEQ to receive copies of Tier II reports from 17 Houston area facilities from 2015 to 2018. The request was immediately denied as TCEQ noted that they cannot provide “any information maintained by a government entity that is more than likely to assist in the construction or assembly of a terrorist weapon” (McDaniel, 2020, para. 16).

Becknel (2019) notes that LEPCs are currently in regulatory flux since the Trump administration has not continued President Obama's efforts to improve chemical facility security and right-to-know disclosures following the West incident. On August 1, 2013, following the April 2013 West explosion, President Obama issued Executive Order No. 13650 (2013) titled *Improving Chemical Facility Safety and Security*, which aimed to increase the safety and security of chemical facilities through risk reduction measures that include (a) strengthened community planning and preparedness; (b) enhanced emergency preparedness requirements; (c) changes to how chemical facility information is shared with the public and local emergency planners/responders (EPA, 2019b). The Accidental Release Prevention Requirements for Risk Management Programs (RMPs), part of the Clean Air Act, were amended to comply with EO 13650. The amendments required that LEPCs, local emergency responders, and the public could more easily access information regarding the risks at nearby facilities in order to better prepare (EPA, 2020). On August 17, 2018, the U.S. Court of Appeals for the D.C. Circuit Court vacated the EPA's June 2017 effective date for the RMP Amendments rule (EPA, 2020).

The political influence on the nexus between environmental law and homeland security cannot be overlooked as chemical hazards, right-to-know, and national defense policies are frequently amended in response to incidents to make us safer, more secure, more transparent, less vulnerable, and everywhere in between. EPA enforcement is discretionary and presidential candidates frequently campaign on promises to expand or shrink regulations. The chemical industry lobbies for governmental support at the federal, state, and local levels, often in opposition to increased operating regulations. When President Obama issued EO 13650 the ACC pushed back, citing that "current regulations

already adequately cover reactivity hazards and expansion is unjustified” (Carroll & Dempsey, 2016, para. 30).

### ***All-Hazards Approach***

After 9/11, all-hazards planning was adopted to address the threat of terrorism and the unanticipated impacts it would have on the current emergency management systems, but local emergency planners were encouraged to give planning for terrorism the same consideration and resources as planning for their community’s most prevalent or significant hazards (Birkland, 2009). In July 2002, the Office of Homeland Security released the *National Strategy for Homeland Security*, which called for consolidating ERPs so that local authorities could design response activities and training around the results of various disasters and emergencies regardless of whether manmade or natural. The goal was to streamline planning, response, and training to accommodate multiple hazards rather than a siloed approach that views each type of disaster as completely unique (Blackwood, 2003). Key local emergency management activities like public notifications, evacuations, and coordinated interagency response can be developed with a generic framework that is applicable to any hazard.

Blackwood (2003) noted that the new homeland security requirement would shift burden to LEPCs to create an all-hazards plan that local jurisdictions could adopt because the chemical incident ERP is already reviewed and updated annually per EPCRA requirements and the level of interagency collaboration required to effectively maintain an all-hazards plan already exists within LEPC organizations. Matheny (2012) found that LEPCs were maintaining EPCRA compliance and all-hazards ERPs with greater success than LEPCs reported in previous studies, which may be contributed to greater

formalization of the all-hazards approach as the national standard for emergency management over that period. Once all federal emergency management operations and training became centered around all-hazards it was necessary for state and local authorities to change accordingly. LEPCs will continue to be included in homeland security all-hazards planning as federal emergency management strategies increasingly depend on local first responders to appropriately handle the early stages of any catastrophe (Blackwood, 2003). Birkland (2009) predicted that future disasters will become increasingly worse for communities since local planning efforts are significantly influenced by federal funding opportunities, which are more likely to focus on counterterrorism activities, and state and local governments have received inconsistent guidance on preparedness (p. 433).

### ***Securitization***

The securitization theory within international relations, first proposed in 1995 by Ole Wøever at the Copenhagen School of Security Studies, is a concept that addresses the nature of security threats and their political and social constructs (van Munster, 2012). Fierke (2015) argues that security shifted at the end of the Cold War to a concept that regards ideological and moral elements above empirical evidence (p. 35). Securitization frames policy and political issues in the context of imminent security threats as a means to elevating priority and escalating the sense of urgency required in addressing such threats. The ultimate goal of securitization is to gain the authority or approval to respond to economic, environmental, military, political, and societal issues with tactics that would otherwise be subject to significant public debate and procedures in governments that define or restrict such measures (Eroukhmanoff, 2018).

Securitization theorizes that there are no objective threats because any issue, legitimate or perceived, can be politically transformed into a security issue through speech acts (van Munster, 2012). The Copenhagen School's criteria for a speech act includes three steps in a process when "an actor (1) claims that a referent object is existentially threatened, (2) demands the right to take extraordinary countermeasures to deal with that the threat, and (3) convinces an audience that rule-breaking behavior to counter the threat is justified" (van Munster, 2012, Introduction section). Once an issue is successfully securitized the approach to managing it will change via the new acceptance of necessary emergency measures. Where securitization theory is relevant to emergency management is with consideration to whether or not the emphasis on an all-hazards approach has transformed elements of community preparedness into security issues.

While it is somewhat difficult to frame an international relations theory within the context of state and local governments, it is worthwhile to consider the implications of federal-level critical infrastructure protection and resilience securitization in steering local community preparedness toward more homeland security initiatives. Coaffee (2013) argues that the concept of resilience was used after 9/11 to expand national security and preparedness frameworks by elevating the terrorism, disease pandemic, and global warming threats facing communities. Resilience has evolved into a politicized policy-making tool that addresses concerns with weaknesses in critical infrastructure and planning frameworks (Coaffee, 2013). Events like 9/11, Hurricane Katrina, and the coronavirus pandemic have prompted researchers, policy-makers, and practitioners to question whether communities are adequately prepared for the next major disaster. Implementation of resilient strategies and systems design requires a broader array of

stakeholders and greater planning consideration for threats to homeland security (Coaffee, 2013). Bierling (2012) notes that community engagement for emergency planning is an ongoing challenge identified by FEMA, but including more stakeholders from non-government entities also presents a security concern.

If increased focus on homeland security does exist at the state or local level, is at the expense of required activities for chemical incident planning? Texas LEPCs require further study to assess to what degree they are meeting EPCRA compliance, their proactivity levels, and whether they are effectively providing all-hazards planning to their respective communities. Furthermore, are basic LEPCs providing greater all-hazards planning as a result of having fewer chemical facilities and/or greater need to address other community hazards? Do advanced LEPCs consider their greater concentration of chemical risks in metropolitan areas to be an increased vulnerability to terrorism and, therefore, require a more security-oriented planning approach?

### **Research Hypothesis**

Based on the two research questions and the literature review, my hypotheses are as follows:

1. To what extent do Texas LEPCs currently meet the EPCRA requirements for chemical incident preparedness and communicating chemical hazards to the public?

Hypothesis 1: Texas LEPCs do not fully comply with EPCRA requirements regarding chemical facility inventories and right-to-know.

2. What are the implications of all-hazards planning on EPCRA compliance and proactivity?

Hypothesis 2: Increased all-hazards planning in an effort to address more community threats reduces compliance, especially regarding public awareness and proactivity.

## **CHAPTER III**

### **Methodology**

This chapter details the methodology used to explore compliance, proactivity, and all-hazards planning for Greater Houston LEPCs. The goal with this mixed methods design is to have study features that strengthen the validity of the conclusions, which is achieved through triangulation, the availability of rich data for analysis, and the ability to identify rival evidence that emerges from a different collection instrument (Johnson, Onwuegbuzie, & Turner, 2007). Since qualitative research relies on the validity of the collection and analysis of data to produce conclusions that are truly representative, quantitative data can provide necessary clarification or elaboration (Johnson et al., 2007; Yin, 2011, p. 78). Yin (2011) suggests searching for competing explanations and using triangulation to strengthen validity. Approaching the data collected with skepticism and considering in what ways information, from survey and focus group respondents or initial study assumptions, may be misleading will help introduce more careful interpretation (Yin, 2011).

Triangulation is the practice of collecting data using multiple separate and distinct sources (Yin, 2011). For example, direct observation, a verbal report, and documentation of a data point guarantee with reasonable confidence that the information is accurate. Triangulation can be performed as data triangulation, investigator triangulation, theory triangulation, or methodological triangulation. Data triangulation incorporates multiple sources; investigator triangulation uses several researchers to conduct a study; theory triangulation draws from multiple theories to interpret results; methodological triangulation is the use of more than one research method (Johnson et al., 2007). For this

study, methodological triangulation with qualitative and quantitative elements is used in an effort to reduce the errors characterized by each individual method.

There are several possible study biases that must be addressed and factored, like the researcher's membership in one of the LEPC organizations being surveyed and proximity to the study population as professional in the Greater Houston chemical industry. The mixed methods design intends to combat these biases through surveying and focus groups of a sample that is representative of Greater Houston LEPC memberships, plus a rigorous review of relevant literature. No study details were shared with members of the researcher's LEPC or with the researcher's employer beyond the email invitation to participate in the electronic survey. There are no financial disclosures and the researcher is not paid for her work on the LEPC as an officer. As detailed in later sections, the majority of the survey and focus groups questions are not original and, therefore, avoid implicit bias.

### **Research Design**

This research uses a mixed methods multiphase design that originally intended for sampling to be collected through surveys and focus groups. Challenges with both survey and focus group participation led to the need to perform content analysis of public documents to expand the amount of data available to analyze to better identify themes and patterns relative to the research questions. A multiphase design includes quantitative and qualitative designs where the findings from one design inform the next phase of the research (Bachman & Schutt, 2017). Johnson et al. (2007) maintain that a conclusion determined from the findings of two or more methods offer more validity than a single method that presents increased scrutiny for the collection instrument and analysis. Survey

responses are intended to illustrate patterns and trends that can be applied to focus group discussion for more detailed information. Quantitative data supports descriptive qualitative results with numbers that better define terms like “majority,” “some,” and “few” used to highlight significant findings. All methodology described in this chapter was reviewed and approved as exempt by the Sam Houston State University (SHSU) Internal Review Board (IRB). Copies of the survey and focus group instruments, plus all IRB approvals are included in the Appendix section.

### ***COVID-19 Impacts***

Due to increased concerns regarding the coronavirus in March 2020, interest in participation in focus groups was not sufficient to meet the desired session attendance requirements. With guidance from the committee chair, Dr. Denham, the format was changed to individual phone interviews with goal of collecting information from six to eight LEPC members. This collection method also did not yield any willing participants. Spring months are traditionally already very busy for chemical manufacturers, emergency management professionals, and local governments in the Gulf Coast as they finalize preparations for the Atlantic hurricane season. Standard response frameworks may prove inadequate for use in managing two overlapping disasters when key institutions, infrastructure, and stakeholders are already strained and pandemic response directives conflict between local, state, and federal governments. Future research should assess the impacts to LEPC activity and compliance during the pandemic and explore the implications on collaborative hazmat planning when local government, emergency services, and chemical manufacturing companies are also fully managing operations and response to COVID-19.

With additional approval from Dr. Denham, document analysis was selected as the most appropriate and effective qualitative research method to complete the study under the current pandemic conditions. Document analysis was achieved by selecting secondary data—information found in documents, database, and on the internet—that already existed rather than data generated from my original work as part of this research (O’Leary, 2017, p. 484). Document analysis is typically triangulated with other qualitative methods, like observation or interviews, to corroborate findings across data sets and ensure validity (Bowen, 2009).

### **Sample and Population**

The Houston-The Woodlands-Sugar Land Metropolitan Statistical Area is the selected sample due to research proximity, accessibility, and the significant presence of chemical manufacturing. The study population is all LEPCs in Texas. In 2003, there were approximately 4,000 LEPCs across the U.S., with the majority affiliated to counties or cities (Blackwood, 2003). As of 2016, the number of LEPCs known to the EPA had declined to 2,670 (NASTTPO, 2016). While there may be an actual decline in LEPCs, some of this can be attributed to consolidation efforts within large counties containing numerous smaller cities or areas with robust chemical manufacturing that choose to form regional LEPCs. For example, within Harris County the Bay Area and Pasadena LEPCs combined to form the Southeast Regional LEPC, and the Bellaire, Humble, Memorial Villages, and West University LEPCs combined with the Greater Houston LEPC.

All Texas LEPCs are under the oversight of TDEM and subject to the requirements outlined in the Local Emergency Planning Committee guide: Revitalizing and improving Texas LEPCs for local preparedness. This document was developed by

TDEM and Texas A&M University as a reference guide for Texas LEPCs that includes EPCRA history and compliance, chemical inventory reporting, planning goals and objectives, exercises, and more (Trefz et al., 2019). As of January 2020, there are 266 LEPCs registered with the TCEQ, which received chemical inventory reports on behalf of the state, compared to 254 counties (TCEQ, 2020).

The Houston MSA provides a cross-section of metropolitan, urban, and rural county populations and includes varying levels of chemical manufacturing and oil and gas refining. Population sizes vary greatly among Greater Houston counties, which is reflected in the number of LEPCs established for each county. For example, four counties (Austin, Chambers, Liberty, and Waller) each have fewer than 100,000 residents while Brazoria, Fort Bend, Galveston, Harris, and Montgomery Counties all have more than 300,000 residents; Harris County includes 4.6 million (Greater Houston Partnership, 2019). The Houston MSA is the fifth most populous MSA in the United States.

Representation from all 21 Greater Houston LEPCs is desired, but no special steps were taken to guarantee that members from any particular LEPC will respond to the survey. Literature on LEPC surveys suggest that low response rates were to be expected. Blackwood (2003) notes that survey completions are frequently low with public organizations, so sampling is limited to active LEPCs (p. 64). Conn et al. (1990) has a nominal response rate of 33% for their nationwide survey; Whitney and Lindell (2000) had a response rate of 36% when they surveyed Michigan LEPCs; Blackwood (2003) has a response rate of 42% for EPA Region 3 LEPCs surveys; EPA (2008) had a response rate of 39.8% for their nationwide LEPC survey; Rogers et al. (2010) had between a 23.5% and 28.8% response rate for their survey of LEPCs and Tribal Emergency

Planning Committees in 36 states; Matheny (2012) had 67% for her survey of Ohio LEPCs; NASTTPO (2016) had a nationwide response rate of 8%, or 198 responses out of a population of 2,670 LEPCs. The most recent published survey, conducted by Barbour et al. (2020), solicited information from a Texas-Louisiana Gulf Coast LEPC and had a 26.4% response rate.

### **LEPC Survey**

LEPC members, as defined by someone's attendance at a LEPC meeting in the last 12 months, received an invitation for an electronic survey via email. LEPC membership rosters are typically reviewed annually as part of the requirement to provide TDEM with up-to-date information on appointed officers, but there is the possibility that someone who has not attended a LEPC meeting in over a year is still included on a roster. To control for this one of the survey questions asked if the survey taker had attended a LEPC meeting in the last 12 months. LEPC rosters are public record since the organizations are affiliated with state and local governments and, therefore, subject to the Texas Open Meetings Act. Where rosters are published online or publicly searchable, members were emailed information about this study with a survey link included. Survey emails were also sent to all contacts listed on individual LEPC websites and to contacts found on an official TCEQ LEPC roster updated January 2020. Email recipients were asked that they forward the survey invitation to others in their network who may qualify, which is a technique known as snowball sampling.

Snowball sampling is both appropriate and advantageous for this type of research that seeks to collect data from community stakeholders who represent more than a dozen different organizations. One notable weakness in the sampling recruitment is that it likely

reached very few individuals who are not government employees or representatives of regulated facilities; this was determined from both a review of the email addresses where study invitations were sent and from a review of available LEPC officials document that identified officers and other key participants in each LEPC.

The survey used non-probability techniques versus random sampling to identify individuals who would be most likely to provide data based on their involvement with a Greater Houston LEPC. Non-probability sampling provides data interpretations that are only representative of the study group itself rather than applicable to the whole population, but it can reveal themes and patterns relative to the sample subjects (Heckathorn & Cameron, 2017). Non-probability sampling contains selection bias, but the convenience and snowball methods were chosen because they are inexpensive and less time consuming than other methods. Since LEPCs are volunteer organizations with varying operational frameworks and rules and responses are desired from across all Greater Houston LEPCs to collect more diverse, representative data, it is necessary to recruit any LEPC participants who meet the study inclusion criteria. Network-based methods using convenience and snowball sampling methods determined which subjects would be recruited to participate. Convenience sampling uses the availability of records and potential participants to select sample subjects, while snowball sampling uses initial subjects as seeds who recruit from their networks and those wave one subjects then also recruit subjects (Heckathorn & Cameron, 2017, p. 102).

LEPC members who opened the survey link were presented with the research information and the electronic consent form. If a LEPC member chose to participate they would then answer between 20 and 23 open- and closed-ended questions about their

participation in a Greater Houston LEPC, the LEPC's compliance activities, and any other safety or security initiatives that the LEPC incorporates. The electronic survey was provided to LEPC members through the Qualtrics Survey Platform, which is a licensed software with SHSU. A copy of the survey is included in the Appendix.

The LEPC Survey is designed to protect the anonymity of the survey-taker, but does ask questions about which LEPC in Greater Houston they attend, their affiliation with LEPC (government official, first responder, media, community resident, etc.), and whether they hold an appointed position within a chapter. The questions are a mixture of original questions about all-hazards activities and LEPC compliance questions compiled from other published surveys by Starik et al. (2000), Blackwood (2003), Matheny (2012), and NASTTPO (2016). Basic descriptive and inferential analyses identify the sample response rate and percentages of responses that answer either "yes" or "no" for closed questions. Survey responses will never be visible to survey participants.

### **LEPC Focus Groups**

Potential focus groups participants were identified by reviewing the leadership information that is publicly available for each LEPC chapter. Where information was unavailable on the TDEM or LEPC websites, I emailed the contacts listed for each LEPC to acquire officer contact information. Focus group participants were selected based on their involvement in a Greater Houston LEPC and level of experience in emergency planning. According to Krueger (2002), participants should be similar types of people who are carefully recruited based on specific criteria. Approximately 20 individuals—randomized from the pool of all qualifying LEPC members—received an email inviting them to participate in a focus group for my research. The randomization process for this

study was completed using Research Randomizer (<https://www.randomizer.org>), which is a simple and free tool to create unique sets of numbers. The goal was to conduct two focus group sessions with the preferred number of 6 to 8 people, although 5 to 10 people are acceptable (Krueger, 2002). A diverse cross-section of individuals from multiple counties was desired in order to capture a full picture of LEPC membership. Each focus group was scheduled to last approximately 60 minutes with audio recording of discussions. Responses would remain confidential and no names would be included in the final research report. Any recordings and transcribed notes would need to be securely stored on password-protected devices.

The survey questions and their responses were intended to drive the discussion in focus groups since pre-determined, open-ended questions are desired (Krueger, 2002). Allowing survey responses to guide focus group discussion serves multiple purposes: to offer a detailed understanding of challenges regarding EPCRA compliance and limitations in proactivity, to identify researcher biases or misinterpretations of identified patterns and trends, and to explore what non-chemical incident preparedness activities LEPCs are incorporating. Focus group participants would provide the same demographic information asked of survey respondents, so that responses can be better understood in the context of emergency management experience, EPCRA requirements and LEPC organizational knowledge, and stakeholder goals. Krueger (2002) recommends that to yield powerful information, a focus group moderator avoids asking close-ended questions, questions that look into the future, and questions that ask why. Instead, emphasis on attributes and influences, having people draw from past experiences, starting with broad then moving to specific questions, and using five styles of questioning—

opening, introductory, transition, key, and ending—will yield the most valuable responses (Krueger, 2002).

Data from focus groups is drawn from individual, group, and/or group interaction, but most research analyzes the group unit for emergent themes (Onwuegbuzie, Dickinson, Leech, & Zoran, 2009). However, Onwuegbuzie et al. (2009) suggest numerous qualitative analysis techniques that account for text interpretation dilution issues when considering nuances between individuals' degree of consensus and dissent within group discussion (p. 5). Since one or two focus groups is the target, deductive coding with the keywords-in-context technique will be the most straightforward and effective to complete within the timeframe of this study. The deductive, or concept-driven, approach begins with identifying relevant concepts and looking for them within the text rather than concepts emerging organically, which can be extremely time consuming and difficult for a novice researcher (Yin, 2011). This predetermined coding system does not preclude the ability for new concepts to develop and it keeps the process focused on the main themes explored in this research. The keywords-in-context technique is advantageous in understanding how people use specific terms by contextualizing words within the manner they are being used to make a point e.g. the use of the term "preparedness" among multiple participants within a LEPC focus group discussion does not make clear exactly how it is defined by each individual (Onwuegbuzie et al., 2009). Keywords central to data themes are especially important in emergency management where common terminology is strongly stressed as a best practice, but the cultural meaning of certain terms vary greatly depending on an individual's position to an incident. Local government officials, first responders, chemical industry representatives,

and private citizens will use the same terms very differently when discussing the same concept.

### **Document Analysis**

Document analysis is a systematic evaluation of documents that requires finding, selecting, interpreting, and synthesizing written text to identify and organize concepts, themes, and patterns (Bowen, 2009; O’Leary, 2017). Document analysis relies on secondary data, which includes official records, policy documents, and organizational communications, documents, and records. For this research, 196 documents—local and state government records, jurisdictional emergency planning and response plans, LEPC meeting agendas and minutes, LEPC by-laws, LEPC membership applications, and public outreach or educational planning documents and pamphlets—were reviewed for historical insight, background, tracking change and development within LEPCs, and providing questions for future research (Bowen, 2009). Meeting agendas and minutes for the past three years, 2018-2020, were reviewed, except where 2020 data was not available. In those cases, records from 2017 were included. Some documents, like by-laws and ERPs, were not subject to coding timeframes because they are only updated as needed and essential for review and interpretation.

The advantages to analyzing secondary data is that it is content produced by people involved with the specific subject or organization being researched, so it is rich qualitative data that is available without probing people (O’Leary, 2017). The availability and access to this data eliminated the need to recruit focus group or interview participants, which became unachievable due to COVID-19. Bowen (2009) describes document analysis as efficient because it utilizes selection rather collection for having

data available. Documents offer coverage, exactness, and stability because the texts are not subject to influence from the researcher's review of them, they include details of topics or events that may be left out or forgotten during interviews, and they cover a significant period of time often provides historical context to information offered by research participants (Bowen, 2009, p. 31). There are a number of challenges associated with secondary data that require additional consideration for credibility and context since they were not generated from this research. Documents that are intended for purposes unrelated to answering research questions lack sufficient detail to develop research conclusion and are vulnerable to interpretation biases and out of context assumptions (Bowen, 2009; O'Leary, 2017). O'Leary (2017) recommends checking the credentials of each document, determine the motive, and recognize whether a document is objective or biased.

The overwhelming majority of documents collected and interpreted for this research are credible, official reports of legitimate organizations that either capture the details of meetings (agendas and minutes) or describe the procedures and policies of an organization or operation (by-laws, applications, and plans). Interpreting the context of topics documented in meeting minutes is challenging because the researcher may recognize the objective or process as something typically associated with a certain goal, but these biases must be avoided unless there are other sources of data that support an interpretation. For example, meeting minutes serve as both independent and sequential snapshots of an organization's priorities since some topics are standalone operational tasks, while others address long-term strategy. Reviewing meeting minutes chronologically for the completion, extension, or continuation of activities and discussion

of certain topics is beneficial to understanding the broader context and its priority for the organization. Other document types may lack context regarding their development and cannot be used to substantiate assumptions about motive or intent unless they can be triangulated against other qualitative sources.

### ***Analysis Process***

Bowen (2019) describes the process for document analysis as superficial examination, thorough examination, and interpretation, which includes elements of content and thematic analysis. Content analysis involves selecting and organizing information from texts into categories that connect to the research questions, which is distinct from quantitative content analysis that illustrates frequencies (Bowen, 2019). A key analytical tool is sorting information from that which is pertinent to the specific research questions versus information that is otherwise interesting and insightful. Characteristics of a document to account for during interpretation include the creator of the text (government, non-profit, individual, media, etc.), the reason it was produced (awareness, education, record keeping, soliciting information or feedback, etc.), its tone, agenda, and political purpose, if any (O'Leary, 2017). Documents should be probed as if they are a respondent relevant to the research questions so that similar words, phrases, and concepts can be extracted in a manner similar to coding interview transcripts.

Thematic analysis uses pattern recognition from the data's characteristics to code and establish categories, but predefined codes or a categorization matrix to code against are also an option (Bowen, 2019, p. 32; Elo & Kyngäs, 2008). Thematic analysis uses either an inductive or deductive approach, where the former moves from specific to general because there is a lack of sufficient, comprehensive former knowledge on the

topic. A deductive analysis approach moves from general to specific because it is grounded in earlier theory and aims to retest existing data under different parameters (Elo & Kyngäs, 2008). For the sake of efficiency and time constraints, codes were predefined into broad categories: organization structure, collaboration, all-hazards, public outreach, and training activities. The predefined code frame is included in the Appendix.

Blackwood (2003) notes that coding categories provide the researcher with a template as to what information should be extracted from document text so that links between themes can emerge from the data (p. 75).

## CHAPTER IV

### Results

In January and February 2020, 136 LEPC representatives for 21 Greater Houston LEPCs were emailed an invitation to complete an online survey about their committee's general planning practices. Representatives' contact information was found by reviewing the official TCEQ roster of all Texas LEPCs (updated January 6, 2020), which includes one name and email per country or area and by gathering officer or emergency management coordinator information from each LEPC website. In order to expand the sample and increase the probability of more responses from across all Greater Houston LEPCs, the survey invitation asked recipients to refer any individuals who may meet the study inclusion criteria. Snowball sampling was necessary to overcome the limitations with having only one verified contact for each LEPC, extracted from the TCEQ LEPC roster, and limited additional open-source LEPC contact information found via internet searches. There is no way to determine precisely how many individuals were reached via the initial seeds, but I can confirm that one LEPC officer referred 117 potential subjects through their network of LEPC and emergency management contacts. A survey invitation reminder email was sent in mid-February and the survey was officially closed at the end of the month after approximately 30 days being active.

A total of 253 individuals were confirmed contacted: 27 people entered the survey, but only 25 surveys were completed. The response rate (number of completed surveys / number of invitations sent) is 9.9% and the completion rate (number of completed surveys / number of individuals who entered the survey) is 89.3%. While low response rates were expected based on LEPC survey literature, the majority (Barbour et

al., 2020; Conn et al., 1990; EPA, 2008; Rogers et al., 2010; Whitney and Lindell, 2000) had response rates between 25% and 40%. At the high and low ends were both nationwide LEPC surveys, with Adams et al. (1994) reporting a 70% response rate and NASTTPO's (2016) 8% response rate on the low.

The document analysis involved review of 196 individual documents, including LEPC meeting minutes, LEPC by-laws, local government ERPs, LEPC membership applications, TDEM forms, and LEPC informational presentations from across 12 LEPCs. Secondary data was selected from Google searches, local government websites, LEPC websites, government databases, and public information requests. Nine LEPCs had no documents available, including the omission of the SERC's LEPC Membership Update Form (TDEM Form #151), which was provided by TDEM via a public information request and is required to be updated annually.

Eight LEPCs—one county and seven municipalities with the same county—exist only on the TCEQ LEPC roster that was updated in January 2020 and have no proof of being an active LEPC available on the internet. When comparing this against survey data, it was discovered that three respondents identified as being members of three of the eight LEPCs with an unknown status. Another county LEPC updated their TDEM Form #151 in 2019, yet has no LEPC information available on their county government website or available via Google search. Two municipal LEPCs report concurrently meeting with their county LEPC, but none of the three committees have any information beyond Chairperson name and contact details available. In total, no data was collected or selected from five of the 21 Greater Houston LEPCs and where survey respondents provided information on their LEPC, there would be limited or no documents available from which

to compare or corroborate or vice versa. This made synthesizing data between the two research methods nearly impossible since there was not enough overlapping data for triangulation.

To what degree recordkeeping is adequate is unclear, but the majority of Greater Houston LEPCs do not have comprehensive information on meetings, ERPs and local hazards, or committee contacts available on the internet. Eight LEPCs maintain and publish a significant amount of information regarding their committees, meetings, hazmat information, and public outreach, so the content analysis focused on their operations and activities. These eight LEPCs all cover jurisdictions with a high density of chemical manufacturing and industrial processes. From Matheny's (2008) analysis, LEPCs in urban areas with high chemical incident rates that maintain websites and make EPR and hazmat information available to the public receive the most public inquiries. This is likely a result of chemical incidents generating more public interest and the availability of information provided by the LEPC allows the public to better understand the risks in their community and ask questions regarding hazards and planning. In other words, the public cannot participate in what they do not know, so engagement is the result of people being better informed.

Data from this research on Greater Houston LEPCs was examined for compliance and proactivity to determine what trends exist and establish a baseline for generalizability to all Texas LEPCs. The goal was to measure Greater Houston LEPC compliance with EPCRA requirements and chemical hazard communication to the public, and assess the implications of all-hazards planning on EPCRA compliance and proactivity. Some comparisons can be made between these survey results and the data from existing

literature, but the primary difference is that this research probed individual members of LEPCs whereas other studies collected one set of data from each LEPC. Therefore, the survey results reflect the attitudes and opinions of members regarding their own LEPC and are subject to bias and incompleteness depending on their own participation within the committee and level of knowledge regarding activities. The content analyzed from documents provided useful data, but without corroboration using an additional qualitative method it is not sufficient.

### **Survey Results**

The first section addresses the LEPC membership demographics results of the survey, which were captured in the first three questions: the respondent's LEPC jurisdiction, their membership category, and whether or not they hold an appointed position. This intended to provide data that would contextualize differences in responses as they may relate to geography, stakeholder class, and knowledge. Greater Houston LEPCs vary greatly in the populations they represent, the density of regulated facilities in their jurisdiction, and their membership diversity. Members of eight different Greater Houston LEPCs participated in the survey, which is less than half of the available sample. Over half (52%) of LEPC members providing survey data belong to the same LEPC, so the results are not accurately representative of the study sample. Respondents belong to seven member categories: employee of a regulated facility (32%), emergency management (28%), firefighting (12%), EMS (8%), law enforcement (8%), municipal/county government (8%), and community members (4%). This is not the same as measuring membership representation within LEPCs, which was asked in Question 9. Fewer than half of responding members (36%) hold an appointed position with their

LEPC, but those who do serve as chairperson, emergency preparedness liaison, communications committee chairperson, and executive administrator.

### ***LEPC Meeting Frequency***

The majority (60%) of responding members report that their LEPCs meet quarterly, while the remainder meet monthly (16%), every other month (12%), or as needed (4%). One survey respondent reports that their LEPC meets monthly except for March, July, and December months. Adams et al. (1994) found that nationwide 61% of LEPCs met at least quarterly and 34% met at least every other month. The EPA (2008) reported that nationwide 72.4% of LEPCs met at least quarterly, 11.8% met as needed, and 8.8% did not meet at all in the past 12 months. LEPCs that did not meet at all in the past 12 months were the result of not having sufficient member participation (EPA, 2008). In a survey of Ohio LEPCs, 83.5% met at least quarterly (Matheny, 2012). It is not possible to determine if meeting frequency rates from the current survey are consistent with previous studies due the lack of sufficient representation from the sample. Additional data from non-responding LEPCs may or may not prove that the majority of Greater Houston LEPCs meet at least quarterly.

### ***Public Notification of Meetings***

Nearly 44% of LEPCs report public notifications of upcoming meetings, while approximately 20% report no public notification and 35% reported that they do not know whether or not their LEPC notifies the public. Adams et al. (1994) and EPA (2008) both reported that over two-thirds of their respective surveyed LEPCs advertised their meetings to the public.

### ***Familiarity with EPCRA Requirements for LEPCs***

Participants were asked to rate their own familiarity, on a scale of 1 to 10, with the mission and objectives of a LEPC as outlined by the EPCRA; 1 is no familiarity, 5 is somewhat familiar, and 10 is very familiar. Participant responses are evenly spread across all degrees of familiarity between ratings 4 and 10. This includes 32% of participants rating their familiarity as either 4, 5, or 6; 44% of participants rating familiarity as 7 or 8; and 24% rating familiarity as 9 or 10.

### ***LEPC Chemical Incident Preparedness***

Using a dichotomous question to ask participants if their LEPC is doing enough to prepare for chemical incidents, 56.5% responded yes and 43.5% responded no. A more revealing question for future research would ask “I am satisfied with what my LEPC is doing to prepare for chemical incidents,” and use a Likert scale to measure opinions. Rather than yes or no responses that lack degrees of agreement or dissent, a Likert scale allows survey participants to express their opinion on a range from strongly agree to strongly disagree. Question 8, the follow-up, asked participants to briefly explain their yes or no response to the previous question that asked whether their LEPC is doing enough to prepare for chemical incidents. The question was free response with no fixed code frame, so I read the responses provided by 21 participants twice before separating them into single phrases to be categorized. The seven themes determined are preparedness activities, membership, LEPC characteristics, LEPC meetings, communications, collaboration, and public outreach. Responses were also categorized as positive, neutral, or negative in order to illustrate how survey participants may provide responses in the same category, but with different attitudes.

**Table 1***Frequency of Themes Identified in Question 8*

Theme	Frequency	Percent
Preparedness Activities	13	32.5%
Membership	6	15%
LEPC Characteristics	3	7.5%
LEPC Meetings	6	15%
Communications	5	12.5%
Collaboration	3	7.5%
Public Outreach	4	10%

The thematic distribution for a total of 40 phrases is illustrated in Table 1, where free responses most frequently reference preparedness activities, membership, and LEPC meetings. Additionally, attitudes towards the themes largely skewed positive at 47.5%, while 12.5% skewed neutral, and 40% skewed negative. Adjectives, adverbs and other descriptive indicators assist in determining attitudes in phrases; some examples include: poorly, lack, needs, great, and wish. Attitudes of phrases can also be inferred based on the responses in Question 7, since it was designed as an elaboration to the yes or no answer. This distribution requires follow-up inquiry from a focus group or individual interviews to establish reliability and validity.

***Participation from Required Members***

Active participation in LEPCs from the required stakeholders identified by the EPCRA—including law enforcement, firefighting, civil defense, public health, transportation, and environmental groups—was reported by 87% of respondents. Unlike

previous surveys (Blackwood, 2003; EPA, 2008; Matheny, 2012) that asked each LEPC to report their member representation, this survey only asked if the EPCRA designated groups do or do not participate. Blackwood (2003) reported that firefighting participated in all surveyed LEPCs, followed by law enforcement and elected state and local officials with 91.1% participation each; later studies (EPA, 2008; Matheny, 2012) validated these findings with similar representation (>90%) reported for firefighting, law enforcement, and state and local elected officials.

### ***LEPC ERPs***

Despite Texas Disaster Act requirements deviating from the EPCRA requirement that LEPCs to maintain their own ERPs, 46% of LEPC participants report that their committee maintains its own plans; 23% reported no LEPC plans and nearly 31% don't know. This question design may have confused LEPC members who are aware of the state requirement for local jurisdictions to maintain the plan or because some LEPCs do support their local government by maintaining the Annex Q: Hazmat Response section of ERPs. This question would require follow-up in interviews to understand if LEPCs are being asked to support to their local government in emergency plans development or if they are maintaining plans that the jurisdiction has failed to provide. Future research should explore the advantages and disadvantages to LEPCs maintaining ERPs independent of their local jurisdiction and what implications this has on collaboration, training, and response. EPA (2008) asked LEPCs which ERP first responders would use during a chemical incident: 56.5% reported a plan developed by another emergency response organization, 54.3% reported the LEPC plan would be used, and 46.5% reported that responders would provide support based on the chemical facility's plan (p. 9).

### ***ERP Review Frequency***

The majority (40%) of survey respondents do not know how frequently their LEPC reviews ERPs and 30% of respondents report an annual review. Other frequencies noted are biennial review (10%), as needed (10%), and every five years for the Annex Q plan (10%). Nationwide, where other SERCs require LEPCs to maintain ERPs, nearly 60% of responding LEPCs conduct annual reviews and make updates (EPA, 2008). Matheny (2012) reported that over 80% of responding LEPCs had updated and exercised their ERP in the last 12 months.

### ***ERP Stakeholders***

LEPC ERP reviewers include various combinations of appointed LEPC officers, LEPC members, local government officials, local government employees, and community members. Approximately 20% of responses report that LEPC members are solely responsible for reviewing plans, while another 20% report that reviews are completed by LEPC appointed officers and local government officials collaborating together. One respondent noted that the plan is presented annually to their LEPC for input from all key stakeholders and interested parties. A follow-up survey question should measure respondents' familiarity with their LEPC or local government ERP to determine the relationship between participation in ERP review and knowledge of its content. Matheny (2012) found that 72% of those surveyed were "very familiar" and 28% only "familiar" with their LEPC ERP.

### ***ERP Distribution and Availability***

From the 10 respondents who answered an additional three questions regarding LEPC ERPs, 40% reported that their plans are not distributed to community stakeholders

or available online and 60% do not know. This question does not establish whether or not emergency responders and regulated facilities are briefed on LEPC ERPs. The availability of ERPs is an essential aspect of community engagement and right-to-know because the public should understand their own role in a chemical emergency and what is expected of them by responding agencies and organizations. Emergency response plans do not contain inventory lists of specific chemicals so there are no risks associated with homeland security. Adams et al. (1994) report that 51% of surveyed LEPCs failed to publish a newspaper notice about the public availability of the ERP, but that 88% do maintain a procedure that outlines a plan to make the information available. EPA (2008) report that 90% of LEPCs surveyed include a section in their ERP regarding public notification of natural hazards.

#### ***Local Government ERP Review***

Nearly 43% of respondents report that their LEPC does provide input to their respective county or municipality's emergency plan, while approximately 14% report that their LEPC does not participate and nearly 43% do not know. LEPCs' diverse and knowledgeable membership pool can provide bridging and linking social capital if meetings are properly organized and the public is notified. LEPCs with frequent, formal meetings are an opportunity for community engagement and interorganizational communication that is rarely otherwise available in communities (Barbour et al., 2020).

#### ***Annual LEPC Activities***

Survey participants were given multiple choices from which to select activities that their LEPC conducts or participates in annually. Nearly 65% reported that their LEPC participates in table-top exercises and 32% report participation in drills or

specialized training activities. The least common activities that LEPC members report committee participation in are full-scale exercises and responses to chemical incidents. Matheny (2012) found that public briefings were the least likely type of exercise practiced by Ohio LEPCs, with only 28% of responding LEPCs completing a public briefing in the last five years (p. 116). This data point links to issues with LEPC ERP distribution and public availability. Communities cannot hold regulated facilities or local governments accountable if they are unaware of what preparedness and response information exists and excluded from key stakeholder planning and training activities.

### ***LEPC Member Education***

When asked if members receive education from their LEPCs regarding the four major provisions of the EPCRA (emergency planning, emergency release notification, hazardous chemical storage reporting requirements (Tier I or II), and/or toxic chemical release inventory), 45% of members report that their LEPC does educate members, 18% do not, and 36% do not know. With over half of respondents either not receiving EPCRA education or not being sure if they receive it from their LEPCs, this would be a noteworthy topic to explore in focus groups.

### ***Public Notifications of Hazmat Information***

Six out of nine LEPC members report that their committee uses a LEPC website to notify the public about hazmat information. Around 27% report using community outreach activities and 18% use public meetings. However, the majority the members report that their LEPCs use a combination of communication methods and outreach activities. EPA (2008) found that nearly 60% of responding LEPCs notify the public of the availability of the ERP and chemical hazard information, primarily through

newspaper notices. At the time of the EPA (2008) survey, less than 25% of responding LEPCs had a website.

### ***Public Notification of Chemical Incidents***

Only slightly more than half (52.4%) of respondents report that their LEPC presents information on recent chemical incidents in their jurisdiction, while nearly 15% report no communication of recent incidents and 33% do not know. This raises questions about whether LEPCs are receiving information on incidents in their area and what communication gaps may exist between a LEPC and regulated facilities and/or a LEPC and emergency response agencies. For LEPCs who do present information on recent incidents it would be important to know how they receive it and if a formal reporting process exists.

### ***Collaboration with Regulated Facilities***

All respondents except one indicated that their LEPCs collaborate through a combination of activities, with the majority being LEPC meetings, meetings between first responders and facilities, exercises/drills, facility tours, and report collection. LEPC meetings are utilized by 95% of responding members followed by 55% conducting exercises and/or drills. It is unclear how this collaboration is spread across covered facilities or if LEPCs conduct a high volume of activities with only a few companies. Furthermore, what impact does membership participation by covered facilities have on LEPC collaboration?

### ***Planning and Preparedness for Other Incidents***

Nearly 64% of members surveyed note that their LEPC does plan and prepare for non-chemical safety and security incidents. Nearly 14% report no and 23% do not know.

Nationwide, many LEPCs report that the shift to an all-hazards approach means that LEPCs are duplicating local emergency management agency activities, which can be a collaboration benefit or an indication of a LEPC's weakening role in its jurisdiction (EPA, 2008). It is unclear if and how Greater Houston LEPCs establish planning goals for each year and what influence leadership, membership representation, current chemical industry and homeland security trends, and SERC priorities have on annual LEPC planning goals.

### ***Annual Planning Dedicated to Non-Chemical Incidents***

Planning and preparing for non-chemical safety and security incidents do not constitute the majority of the responding members' LEPC activities. Half of respondents report that their LEPC dedicates about 25% of annual planning and 28.5% report dedicating less than one-quarter of annual planning to activities unrelated to chemical incidents. Understanding how LEPCs identify and prioritize planning topics is necessary to understand the motives for including non-chemicals incidents. Do LEPCs that report low amounts of non-chemical incident planning focus primarily on meeting compliance requirements? What influence does the density of regulated facilities in a jurisdiction have on LEPC planning priorities (e.g., do LEPCs in areas with very little hazmat presence provide greater all-hazards planning to their communities)? Data from 2008 shows that many LEPCs have adopted an all-hazards framework since 9/11 and no longer serve their communities exclusively with hazmat incident planning (EPA, 2008). One reported benefit to the all-hazards approach is that LEPCs experienced increases in community interest and participation (EPA, 2008).

### ***LEPC Focus on Homeland Security Incidents***

Half of members surveyed report that their LEPC focuses on current homeland security incidents or emerging threats, while approximately 18% report no and nearly 32% report that they do not know. Blackwood (2003) reported that 53% of LEPCs with their own ERP addressed terrorism. However, this is not necessarily a post-9/11 effect since before the attack, the EPA already created a goal for 50% of LEPCs to include terrorism planning by 2005 (Blackwood, 2003, p. 156). EPA (2008) reported that 77.5% of responding LEPCs included homeland security in their ERPs, compared to the 1999 LEPC Survey when approximately 40% of active LEPCs included counterterrorism as a section in their ERPs. More research is required to determine if the 9/11 terrorist attacks motivated LEPCs to include homeland security or whether the national emergency management shift towards all-hazards was the leading factor.

### ***Obstacles to LEPC Improvement or Success***

Low turnout and involvement from members (66.7%) and funding (52%) are the two leading obstacles identified by the majority of survey respondents. Approximately 29% of respondents identify limited cooperation and/or participation regulation facilities as another obstacle. One member explained that their LEPC is relatively successful in meeting goals and objectives, but that they would benefit from technology assistance to improve the LEPC website. EPA (2008) found that a lack of funding was cited as the leading obstacle to success by the majority (37.3%) of responding LEPCs, followed by low membership. A discussion about LEPC obstacles to success is required in a focus group to achieve a diverse perspective and understand how different LEPC members may

define success based on their membership category and understanding of EPCRA requirements.

### **Document Analysis**

The eight LEPCs with a significant number of available documents regarding their committees' organization and activities illustrate varying degrees of compliance and operate with a combination of clearly defined mission, goals, leadership, and strategy for completing objectives. Compliance is determined by Lindell and Meier (1994) and Adams et al. (1994) as whether or not a LEPC conducts activities that achieve one or more EPCRA requirements. Adams et al. (1994) went further and established criteria to classify LEPCs as either not compliant, mostly compliant, and compliant based on a scale of how many EPCRA requirements are fulfilled. However, there is not enough data from this study to make similar comparisons with Greater Houston LEPCs. Five of the eight LEPCs are compliant based on the activities identified from available documents that are considered authentic and reliable. The predefined categories for content analysis are organization structure, collaboration, all-hazards, public outreach, and training activities. Each LEPC was randomly numbered one through eight for purposes of identification during coding and discussion, and since they are not active participants in this research.

### ***LEPC By-Laws***

Most compliant LEPCs have by-laws that outline the four major provisions of the EPCRA—emergency planning, emergency release notification, hazardous chemical storage reporting requirements (Tier I or II), and/or toxic chemical release inventory—dictate other operational requirements as determined by the SERC, municipal mayor, or county judge, describe membership requirements, and describe how activities are

determined. LEPC Chairperson and Vice-Chairperson officers are always elected, either by the general membership or by an executive committee, while Secretary, Treasurer, and Information Coordinator are either elected or appointed. For Information Coordinator, LEPC 1 appoints someone employed by their jurisdiction's office of emergency management; the LEPC 2 executive committee appoints someone from within the LEPC membership; LEPC 3 uses someone on staff of the local government that has been selected by the city mayor to serve as LEPC Secretary and Information Coordinator; LEPC 6 designates the local government emergency management coordinator; and LEPC 7 elects an Emergency Coordinator who fulfills the duties of IC. LEPC 6 and 7 also have a Plant Manager Liaison position that is nominated by an independent organization of plant managers in their respective jurisdiction and approved by the executive committees. LEPC 3 has a Community Emergency Coordinator position that is filled by the city's Director of Emergency Services and responsible for receiving hazmat release reports and conducting the annual review of the ERP. LEPC 7 funds a part-time secretary position to manage administrative duties regarding LEPC recordkeeping and notifications.

### ***Membership Requirements***

Membership requirements vary among Greater Houston LEPCs, which is likely attributed to the fact that the EPCRA determines what members must be represented, but does not provide a procedure for acquiring members. The county judge for LEPC 1 nominates the of names of Tier II reporting facilities to SERC for review and approval, while all other member categories identified by the EPCRA are formally invited to participate. Regulated facilities may be disqualified from the LEPC if they acquire five or more absences from formal meetings over two years. LEPC 2 classifies members as

affiliate (elected or appointed local government officials), industry (regulated facility), and community (private citizens and citizen groups). Industry members must be nominated by the LEPC and approved by the county judge before SERC is notified. Regulated facilities must be represented at 75% of formal meetings each calendar year and serve on at least one standing committee. LEPC 3 has community and industrial members, where industrial members have voting privileges and can be removed from the LEPC if they miss five or more formal meetings in a calendar year. LEPC 6 requires nomination by the county judge and approval from SERC and, in order to maintain good standing, must participate in one standing committee, not have more than five absences from regular or subcommittee meetings, and provide fair share financial support. LEPC 7 membership categories include government (appointed and elected), industrial (regulated facilities), and affiliate (the remaining EPCRA member groups, plus home owners' associations).

### ***Standing Committees***

By-laws also establish standing committees for each LEPC that assist in managing the required duties and developing activities to meeting EPCRA compliance requirements. LEPC 1 maintains right-to-know, public education and information, facilities liaison, and emergency response and resources committees that address chemical release reporting, trade secrets, recordkeeping, awareness campaigns, and ERP review and training. LEPC 2 has communications, planning, public education and information, and emergency response and resources committees. There is limited information available on these committees because LEPC 2 is new and their by-laws were implemented in October 2019. LEPC 3 has executive, communications, community

awareness, and emergency response/transportation preparedness committees. LEPC 6 has executive, emergency communications, emergency response and resources, hazmat facilities liaison, planning, and public education. LEPC 7 has emergency response and security, compliance, emergency warning systems, and public education and community awareness committees. Standing committees are typically indicative of a robust and involved membership and help show commitment to goals, which can motivate members (Lindell et al., 1996). The committees identified are all relevant to the major provisions of the EPCRA and link to the LEPCs' state objectives, so there is not ambiguity about why members are required to serve on committees or how responsibilities are assigned (Whitney & Lindell, 2000).

### ***Formal Meetings***

EPA (2008) found that nationwide 86% of active LEPCs have formal rules of procedure and 91% hold formal meetings. LEPC 1 meets odd numbered months, publishes notice of all meetings on the county website at least 72 hours prior and at least once per year a public notice on the county website and social media is published to invite public comment. LEPC 1 also posts meeting minutes dating back to 2014 on their website. LEPC 3 holds at least 10 regular meetings each year, which are published as public notices at the courthouse 10 days prior to each meeting date. Special meetings can be scheduled upon request and with approval from the executive committee and ad-hoc committees meet at least quarterly. LEPC 6 holds a minimum of 10 meetings per year with the agenda published on the LEPC website in advance and maintains meeting minutes dating back to 2018 on their website. LEPC 7 holds eight general meetings per

calendar year. These four Greater Houston LEPCs all meet at least quarterly, which satisfies one of the five proactivity criteria developed by Adams et al. (1994).

### ***Budgets and Funding***

Finances are another important aspect of an organization's operations as they typically drive the ability to conduct activities and expand in scope. EPA (2008) reported that 59.3% of LEPCs do not have operating budget and 64.1% do not receive direct funding, while Matheny (2012) found that 42% of active Ohio LEPCs lacked an operating budget. As a result, funding was cited as the single greatest obstacle from 37.3% of LEPCs surveyed nationwide (EPA, 2008). Blackwood (2003) found that 85% of inactive LEPCs lacked an operating budget, which is likely attributed to the fact that running an effective organization requires money to hire staff, perform outreach initiatives, and acquire equipment to perform training. Matheny (2012) reported that 65% of surveyed Ohio LEPCs had paid full or part-time staff, although some of these staffers were subcontracted from their local jurisdictions' office of emergency management. LEPC 7 pays a part-time secretary and LEPC 1, 3, and 7 all receive assistance from an employee of their respective local governments, which likely attributes to those LEPCs' breadth and efficacy of activities. The majority of LEPCs reviewed received funds from membership, reporting fees, and donations; however, donations are only an option if a LEPC is not quasi-governmental and maintains a 501(c)(3) non-profit status. LEPC 2, 3, 4, 6, and 7 all require regulated facilities to pay membership fees, and good financial standing is required to maintain voting privileges, while some have a sliding fee scale for other EPCRA membership categories. The membership fee schedule for LEPC 2 is broken down between Tier II-reporting facilities and all other members, where Tier II-

reporting facilities also pay a fee based on number of employees working within the LEPC jurisdiction. LEPC 3 requires regulated facilities to pay for full membership status, but those outside city limits pay 50% of the full fee, while other members like transportation and service provider companies pay a flat fee. LEPC 3 maintains a substantial budget, reporting approximately \$240,000 in December 2019, which is similar to 2018 end-of-year reporting. LEPC 6 also maintains a substantial budget, reporting \$116,000 in September 2017 from which \$92,000 came from a TCEQ LEPC grant, and maintaining at least \$50,000 in funds since then; another TCEQ LEPC grant was awarded in 2019, for an unspecified amount. Other funding sources include an annual golf tournament, which raised \$17,000 in 2018. LEPC 3 was awarded a TCEQ LEPC grant in 2020 and applied for a Hazardous Materials Emergency Planning (HMEP) grant, awarded by the Pipeline and Hazardous Materials Safety Administration (PHMSA). LEPC 4 also applied for a HMEP grant in 2020 and received a \$50,000 donation from a regulated facility. LEPC 6 requires its covered facilities to reimburse the committee, up to \$10,000, for incidents that require the distribution of public information materials and phone notification services to the community. EPA (2008) reported that HMEP grant funding accounted for nearly 40% of LEPC revenue, while Matheny (2012) reported that 72.7% of Ohio LEPCs receive this grant as a revenue sources. Additionally, EPA (2008) and Matheny (2012) report that local fees accounted for only approximately 9% of revenue, which suggests that the majority of LEPCs nationwide do not depend on membership fees to support activities.

Understanding how LEPCs allocate money is important for understanding the impact of funds on compliance and proactivity efforts. LEPC 6 has used golf tournament

contributions and TCEQ grants to sponsor a Household Hazardous Waste Day event, an EPA Risk Management Plan project, new radios for the local police department, upgrades to the city's five outdoor emergency sirens, triage equipment and gas masks for city EMS and police, and, most recently, a full-scale exercise. LEPC 3 used their 2020 TCEQ LEPC grant money to buy the city new emergency sirens, which would not have been affordable otherwise. The HMEP grant, if awarded, will be used for residential and business hazmat information packets. In 2019, LEPC 4 and 6 established a high school scholarships to be awarded based on an emergency management topic. LEPC 4 intends to use their 2020 HMEP grant money to conduct a Commodity Flow Study, which determines what chemicals travel down roadways on a daily basis and the regulated facility donation of \$50,000 was designated for a public education campaign on hazmat. LEPC 7 also uses their membership dues to support the region's emergency siren system. These initiatives all strengthen a community's preparedness and response capabilities and, in some instances, are providing essential emergency management equipment and/or training that the local jurisdiction may not otherwise be able to afford.

### ***Collaboration and Training***

Collaboration is an important characteristic of LEPCs because it creates and strengthens relationships that contribute to improved preparedness and response; incident management suffers when these relationships do not exist, and agencies do not know what is expected of one another. Most active LEPCs in Greater Houston illustrate high levels of collaboration, which includes planning, training, and public outreach, through partnerships with local government, community organizations, regulated facilities, or organizations from other required member categories. Matheny (2012) notes that

individual group weaknesses are overcome through collaboration, forming strong networks that are more capable of meeting compliance requirements. Collaboration is necessary as more LEPCs get tasked with implementing an all-hazards planning approach.

Due to the significant overlap between collaboration and training both are discussed in the section. LEPC 1 observes or participates in numerous community and facility drills and exercises each year, including the Strategic National Stockpile Full-Scale Exercise in 2017, one tabletop drill in 2018 and 2019 each, and one joint ACC CAER-LEPC exercise in 2019. LEPC 3 sponsored a drill and action-action review for members in 2018, conducted a drill in 2019 that used a recent local chemical incident as the scenario and involved all LEPC member categories, and has a tabletop drill scheduled with the city's emergency operations center for November 2020. LEPC 4 consistently participates in hurricane and other severe weather planning events, including a symposium hosted in 2019 by regulated facilities and a city-sponsored hurricane workshop. LEPC 6 is a lead coordinator in the city's annual shelter-in-place drill that trains the public on how to respond to an emergency siren and where to find critical information during an incident. LEPC 6 functions as an effective liaison between the community and chemical facilities by coordinating activities on behalf of the industry and taking advantage of greater participation than what would otherwise occur if each regulated facility performed outreach individually. This also signals to the community that regulated facilities are unified under a single organization with common goals.

***ERPs***

According to Matheny (2012), an approved ERP is the main deliverable of a LEPC, but, as previously stated, the Texas SERC left this responsibility with local jurisdictions. Barbour et al. (2020) recognize that LEPCs serve their communities in an advisory role, which reviews and gives feedback on emergency plans, or a coordinating role, which arranges planning and communications among organizations and hosts training (p. 6). Some Greater Houston LEPCs both advise and coordinate, so this may account for the wide variation in activities across committees. Trefz et al. (2019) note that Texas LEPCs should review local jurisdiction emergency operations plans and regulated facility plans annually or biannually, following any full-scale exercise, and after a chemical incident response (p. 5-1). LEPC 1 reviews the local emergency management plans (EMPs) of regulated facilities and cities within the jurisdiction at least annually with primary focus on emergency warnings, population protection, emergency public notifications, resource management, and hazmat response. The county maintains its own EMP that uses an all-hazards framework and addresses the role of the LEPC in hazmat and oil spill response with regard to chemical and other hazmat inventories and public notifications. LEPC 3 maintains its own Comprehensive Emergency Plan for its jurisdiction, but it is not publicly available and requires a public information request to access; there is not additional information available as to why the plan is restricted. However, since 1986 the city's CAER Team has produced an emergency preparedness guide that classifies incidents into three levels of severity and provides the public with a hotline to call for information on chemical releases. LEPC 7 does not have an ERP, but it does partner with the city's office of emergency management to serve as the official

repository for regulated facility ERPs. Plans can be viewed upon written request, but confidential information may be restricted; LEPC 7 classifies RMPs and security information regarding “terrorism mitigation” as confidential. For LEPC 8, the county maintains both an emergency management plan and hazard mitigation plan that identifies the LEPC as the owner of the Annex Q section. The emergency plan contains redactions for critical infrastructure protection that are “considered confidential and not for release to the public under Section 418.176 – 418.182 of the Texas Government Code,” which outlines under which circumstances information relating to emergency response providers, risk assessments, critical information, and security systems can be withheld from public disclosure.

### ***Public Outreach***

The EPCRA designed LEPCs with a bottom-up, whole-community approach, but this is not possible without adequate public outreach that engages all the organizations and individuals beyond the core group that play a direct role in chemical incident management. Barbour et al. (2020) note that LEPCs have previously been criticized for poor connections with stakeholders who exist outside of the core group, which is a fundamental weakness in collaborative risk communications. Trefz et al. (2019) identify warning systems, evacuation routes, and shelter-in-place (SIP) procedures as key topics for hazmat public outreach and multiple active LEPCs in Greater Houston are addressing these in their activities. Collecting data from individuals and institutions with no direct local emergency management responsibilities would help measure the impact of LEPC public outreach on communities.

Between 2017 and 2019, LEPC 1 held two public information meetings specifically designed to engage the community on hazmat and emergency management information rather than regular meetings that conduct committee business. In 2019, LEPC 1 collaborated with county officials to develop an app that residents can use to find all-hazards emergency information for the area. LEPC 3 produces a calendar for the public that covers a different chemical emergency preparedness topic each month, including air monitoring, flaring, sirens, SIP, and odor. In February 2018, LEPC 3 launched a new website that is now maintained with support from the city, so it is up-to-date and links to emergency management information on the city website. A new right-to-know initiative in 2019 was the aggregation of operating permits for regulated facilities at the city's public library that are available to view and copy during business hours; per State law the permits cannot be made electronic. In 2019, LEPC 4 focused primarily on developing a public notifications procedure, including the use of the software ENotify. Misinformation on Facebook was a concern, so it was decided that all emergency messaging would be communicated through the office of emergency management and the city's public information officer. LEPC 6 includes a chemical incident notification procedure in their by-laws, requiring regulated facilities to notify the city and LEPC via ENotify during any emerging incident so that information can quickly be pushed to the public. LEPC 6 maintains an all-hazards emergency preparedness guide that provides the public with details on every city notification system and information platforms, plus the outdoor emergency sirens schedule. The committee is also the lead coordinator in the city's annual shelter-in-place drill and conducts yearly training for the school district's teachers on how to protect students during a SIP alert. LEPC 7 publishes

an annual notice in the local newspaper regarding the availability of the city's ERP and inventory forms for regulated facilities. In 2019, LEPC 8 hosted their first annual County LEPC State of the Union meeting to provide the public with a broad overview of the committee's activities and discuss hazmat risks to the community.

### ***All-Hazards Planning***

While some Greater Houston LEPCs incorporate all-hazards planning and training into their activities, the majority of active LEPCs only apply it in the context of chemical incident preparedness. Annual hurricane planning workshops, cybersecurity briefs, and active shooter awareness were discovered in the meeting minutes of five LEPCs, but hurricanes and cybersecurity vulnerabilities both present direct threats to regulated facilities and failure to mitigate their hazards could result in hazmat incidents. Four of the eight Greater Houston LEPCs with a significant amount of documentation available focus almost exclusively on chemical incident preparedness and use the majority of regular LEPC meetings to review recent hazmat incidents within their jurisdictions, plan public outreach activities, and provide regulated facilities with the opportunity to present chemical hazards and emergency response planning information to the community. From the surveys, which largely captured data from a different set of Greater Houston LEPCs, over 50% of respondents reported that their LEPCs dedicate about or less than one-quarter of annual planning on non-chemical incident preparedness activities. Greater Houston LEPCs that are well-organized and highly active in collaboration, training, and public outreach appear committed to improving hazmat preparedness in their communities. The LEPCs that are less active or inactive do not have any associated secondary data that suggests they are providing all-hazards planning in

lieu of focus on ERPCRA requirements—they appear to simply not be doing any preparedness activities.

## **CHAPTER V**

### **Conclusion**

The passage of the EPCRA signaled a shift in federal environmental and emergency management policy by mandating that state governments take responsibility for developing LEPCs, which would then plan and manage chemical incident preparedness in communities (Lindell & Perry, 2001). Through participatory regulation community stakeholders can collaborate to fulfill the requirements established by the EPCRA in a manner that best engages the whole community and considers the all-hazards planning framework (Barbour et al., 2020; Matheny, 2012). The EPCRA requirements address ERPs, emergency public notifications of chemical releases, reporting requirements for hazmat inventory and storage, and right-to-know access (Blackwood, 2003). LEPCs that are compliant and effective coordinate community stakeholders for information sharing and advise local governments by providing feedback on ERPs (Trefz et al., 2019). The goal of LEPCs is not to respond to chemical incidents, but to build social capital, enhance local government emergency management planning, and build relationships among members and across networks (EPA, 2008). These functions create more resilient communities, because information is knowledge and by communicating hazmat risks stakeholders can develop appropriate mitigation strategies (Barbour et al., 2020).

This research explored the origins of local emergency planning and community resilience, established criteria for evaluating organizational efficacy and LEPC compliance, and the impact of homeland security, including securitization theory, on community engagement and right-to-know. Focusing events like the 9/11 attacks,

Hurricane Katrina, and Deepwater Horizon spill exposed significant policy failures in local, state, and federal preparedness (Birkland, 2009; Rubin, 2015). Post-9/11, heightened concerns of terrorism attacks straining local response capabilities led state and local governments to adopt an all-hazards planning approach that had been incorporated into the federal emergency management framework in the 1980s (Blanchard, n.d.; Blackwood, 2003). LEPCs are suitable for adopting an all-hazards framework because they are decentralized and function within close proximity to local hazards, which reduces operational barriers (Waugh, 1991). Blackwood (2003) argued that counterterrorism and, later, broader homeland security measures were adopted by LEPCs because local governments recognized the advantages to using an organization that already engages the community on other hazards.

To measure LEPC compliance and public outreach, Lindell and Perry (1990) and Adams et al. (1994) developed criteria that address EPCRA requirements and additional activities that represent a well-structured, led, and funded organization. Some of these elements were measured in surveys and assessed through document analysis, but there was insufficient data to make determinations regarding levels of compliance for Greater Houston LEPCs. Ultimately, the results are snippets and observations of incomplete data sets that require additional data points for triangulation. A summary of results is below, followed by recommendations for further research.

### **Summary of Results**

This research collected data from Greater Houston LEPCs using electronic surveys followed by document analysis, which was introduced in lieu of focus groups; changes to the multimethod research design were the result of data collection limitations

from COVID-19. The surveys resulted in an extremely low response rate, but focus groups were anticipated to be adequate in corroborating the quantitative data. Ultimately the data collected from surveys and selected from documents provided valuable insight into a portion of LEPCs within the sample population. However, while the data is reliable it lacks validity because it could not be triangulated. Generalizability is not possible because there is an insufficient amount of data from the sample population to make accurate determinations. The results from the data are inconclusive for answering the hypotheses presented in this paper, but present observations that are beneficial for additional research on Greater Houston LEPCs.

It is unclear why some Greater Houston jurisdictions do not have functional LEPCs, but literature suggests that funding is a leading factor. Blackwood (2003) found that 85% of inactive LEPCs had no operating budget and EPA (2008) cited funding as the single greatest obstacles to LEPCs' success. Another leading factor for Greater Houston LEPCs may be a failure by local governments to ensure that LEPCs receive adequate support and promotion. This is the responsibility of county judges and municipal mayors, but there are no clear enforcement guidelines from either the Texas SERC or the EPA to address this.

In 2016, the Houston Chronicle completed a months-long investigation into chemical manufacturing safety regulations and reported that multiple Greater Houston LEPCs went unfunded and that the City of Houston refused to provide any relevant employee or official to answer questions and discuss concerns with chemical incident preparedness (Dempsey & Collette, 2016). The Houston Fire Department refused to make their Hazmat Coordinator available for interview, citing homeland security

concerns regarding terrorist access to information (Dempsey & Collette, 2016). In May 2020, City of Houston Council Members Abbie Kamin and Sallie Alcorn sent Mayor Sylvester Turner official correspondence that expressed their concern with the state of the Greater Houston LEPC after receiving a public brief on its organization status in April 2020. The letter stated that Greater Houston LEPC members “don’t have the time or resources to carry out mandated responsibilities,” and that it requires participation from the City of Houston Office of Emergency Management, Houston Fire Department, and Houston Police Department to “provide increased support and communication” (Kamin & Alcorn, 2020). On June 3, 2020, the Greater Houston LEPC announced that the City of Houston had appointed the Director of the Mayor’s Office of Public Safety and Homeland Security to serve as the local government liaison to the committee. To what degree the Texas SERC promotes or hinders LEPC success is unclear, but the continued desire of the state government to restrict right-to-know access does not motivate local governments or LEPCs to be transparent (Dempsey & Collette, 2016).

In communities with a high density of hazmat, compliance and proactivity may be attributed to the willingness of regulated facilities to meet industry standards. The ACC’s CAER program started in 1986, before the passage of the EPCRA, and requires participation from all ACC company members. The ACC serves as a powerful trade organization that lobbies on behalf of the chemical industry, so there is considerable financial incentive for companies to remain members in good standing. Robust CAER programs in certain communities may bolster LEPC participation since many initiatives overlap. Barbour et al. (2020) posit that participating organizations may be better

prepared than non-participating organizations because the EPCRA gives clear guidelines to follow and preparedness reduces operating costs.

While the EPCRA intended for LEPCs to make information on chemical hazards available, it does not require that the information necessarily be distributed or easy to access. The EPCRA determines which community stakeholders must participate in a LEPC, but the EPA failed to provide an enforcement mechanism at the federal or state level to address this. Most Greater Houston LEPCs require members to remain in good financial standing to vote and private citizens and community groups are often excluded from holding voting privileges. Secondary data from multiple LEPCs suggests that they successfully bolster relationships between the chemical industry and local government (officials, emergency management, first responders), but cannot demonstrate examples of linking capital between the institutions that hold information and the people who need information. Bierling (2012) argues that in this sense LEPCs are representative, but not democratic, and citizen participation remains weak because LEPC leaders fail to appropriately incorporate the public into the organization's internal activities and sensitivity toward the information being handled leaves decision-makers reluctant to fully embrace stakeholders outside the core group (p. 31). The research questions, hypotheses, and results are presented below:

1. To what extent do Texas LEPCs currently meet the EPCRA requirements for chemical incident preparedness and communicating chemical hazards to the public?

Hypothesis 1: Texas LEPCs do not fully comply with EPCRA requirements regarding chemical facility inventories and right-to-know.

Results: The majority of Greater Houston LEPCs are either not compliant or mostly compliant, according to Adams et al. (1994) criteria, which means that they satisfy between 0 and 5 EPCRA elements or between 6 and 8 elements. However, this hypothesis lacks sufficient sample representation and data saturation, and is therefore unsupported.

2. What are the implications of all-hazards planning on EPCRA compliance and proactivity?

Hypothesis 2: Increased all-hazards planning in an effort to address more community threats reduces compliance, especially regarding public awareness and proactivity.

Results: Active LEPCs in Greater Houston do not dedicate a significant amount of time to all-hazards planning and, therefore, it does not appear to have any measurable impact on public awareness and proactivity.

### **Recommendations for Future Research**

Future research should attempt to fully explore Greater Houston LEPCs compliance levels and determine contributing factors to inactivity or significant non-compliance. The Texas Gulf Coast presents a unique demographic sample from which interpretations can be made to draw generalizations with other high-density hazmat regions. Additionally, understanding the second- and third-order effects of securitization on state-level homeland security and emergency management policies would reveal more insight to right-to-know restrictions.

## Limitations

The proposed research design underwent numerous modifications to address issues with qualitative data collection methods. Attempts to conduct both in-person individual interviews and focus groups were unsuccessful and as other recruitment or data collection options were being explored, the COVID-19 outbreak became a significant incident. The World Health Organization declared COVID-19 a pandemic on March 11, 2020, and President Trump declared a national emergency on March 13, 2020 (Trump, 2020). Challenges to interview and focus group data collection can primarily be attributed to the demographics of LEPC members and that despite the EPCRA requirements for representation, members volunteer their time in addition to their full-time employment responsibilities. Elected or appointed government officials, emergency management professionals, first responders, and chemical company representatives are often on-call, involved in 24/7 operations, and required to participate in a variety of emergency planning and response activities. These obligations have been greatly exacerbated during the COVID-19 pandemic and the start of the Atlantic hurricane season.

By using only Greater Houston LEPCs as the sample population there is an increased possibility of selection bias and limits to generalizability both for statewide and national assessments of LEPCs. Obtaining membership rosters for Greater Houston LEPCs was a challenge, so survey response rates reflect the willingness or refusal of LEPC leadership to forward survey details to members and/or encourage participation. Self-reported assessments of LEPC activities can provide widely varying responses since members are likely to over- or underestimate performance and respondents may lack of

knowledge about certain LEPC elements (Blackwood, 2003). Blackwood (2003) notes that a regional focus on certain threats or community planning might influence survey responses and this is true for a study region's political climate as well. Preparedness and risk reduction efforts require resources and buy-in from SERCs, local government, and the chemical industry. LEPCs are often, but not always, an official extension of their emergency planning districts (county, city, etc.) and can be either quasi-governmental or operate independently from local government as non-profits. Regardless of their organizational legal and tax status, they require formal and informal institutional support to exist, so their activity levels may be influenced by the motivation and resources of emergency planners and elected officials. NASTTPO (2016) found that 56% of responding LEPCs were chaired by an employee of the local government and 68% of responding LEPCs had their activities coordinated by the local emergency management director.

A future study with a longer data collection period and resources should pre-test the survey instrument with a LEPC population that is not being sampled in order to receive constructive feedback on the development of questions and their responses. Low response rates to certain questions may indicate that the respondents either lack the knowledge to accurately answer or that they do not understand the context of the question as it relates to the topics being explored (LEPC organization structure, EPCRA compliance, etc.) (Blackwood, 2003). This is difficult to overcome in surveys, but can be balanced with interviews which serve to corroborate and augment other data; this triangulation strengthens the reliability and validity of data (Blackwood, 2003). Testing for non-response bias should be conducted in future research to account for the

possibility that response data is not an accurate representation of the sample population. Even in a study with a 70% response rate, Adams et al. (1994) randomly sampled a number of LEPCs who did not respond in order to collect data that would either bolster or challenge the results. Addressing non-response bias can strengthen the persuasiveness of data and increase the survey completion rate (Adams et al., 2004).

Document analysis is dependent on the availability and access to documents that contain the desired information. Public information requests are valuable to research on LEPCs, but are time consuming, often costly, and have no guarantee that the records will be provided. Some TDEM documents that would have been extremely valuable for analysis could not be provided due to COVID-19 resource limitations. Upon submission of TDEM PIR #594 I immediately received an email from the TDEM Chief of Media and Communications asking that I call him to discuss my request. It was explained that TDEM was only able to fulfill a limited number of requests due pandemic response activities taking priority. Multiple LEPCs websites or pages on local government websites provided no information on how to submit public information requests. When only one researcher is performing the content coding there is possibility of bias and data categorization cannot be checked for thoroughness or applicability. Multiple coders would address any uncertainty with coding categories and identify issues with themes that one coder might miss. To achieve content saturation, a predetermined group of documents should be requested from each LEPC in the sample population and, once coded, analyzed with data collected from interviews to complete triangulation.

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## APPENDIX A

### Conceptual Synthesis Excel Dump

CITATION	MAIN IDEA	NOTES 1	CROSS-REFERENCE	QUOTATION
Lindell, M. K. & Meier, M. J. (1994). Planning effectiveness: Effectiveness of community planning for toxic chemical emergencies	LEPC effectiveness depends on disaster planning, strategic planning, and team effectiveness	Time commitments from LEPC members vary due to professional obligations and LEPCs lack a specific funding source designated by EPCRA	Drabek (1986); Drabek (1987); Dyer (1984); Lindell & Perry (1980); Lindell & Perry (1992)	The data here demonstrate the importance of considering the effects of both internal (structural) and external (contextual) factors on organizational performance. (p. 12)
Lindell, M.K. (1994). Are LEPCs effective in developing community disaster preparedness?	SARA Title III compliance has not been met by LEPCs, so it is unclear whether it is an effective preparedness program as currently mandated	LEPC effectiveness is measured from levels of compliance with EPCRA requirements	Dynes & Quarantelli (1975); Lindell & Whitney (n.d.); Lindell & Perry (1980)	
Lindell, M.K., Whitney, D.J., Futch, C. J., & Clause, C.S. (1996). Multi-method assessment of organizational effectiveness in a LEPC	LEPC effectiveness is largely influenced by org design addressing mission, stakeholder engagement, and resources; members' opinions conflict on these issues	Varying levels of effectiveness, hazard vulnerability, and community resources were measured from the combination of standard surveys and personal interviews	Adams et al. (1994); Lindell & Meier (1994); Lindell & Whitney (1995); Whitney & Lindell (1995)	There also were concerns expressed that transportation accidents had not received adequate attention, that the production of "paper plans" had created a false sense of security, and that the resources needed to implement the plans would not be provided (p. 206).
Whitney, D.J., & Lindell, M.K. (2000). Member commitment and participation in Local Emergency Planning Committees	LEPC org commitment (clear mission & goals, achievable objectives) influences member behavior and participation	Survey sample was 97 LEPCs in MI, which averaged 10 members per org. Questionnaires were mailed to 8 randomly selected members of each LEPC	Lindell (1994); Lindell & Meier (1994); Lindell & Whitney (1995); Lindell et al. (1996);	
Lindell, M.K., & Perry, R.W. (2001). Community innovation in hazardous materials management: Progress in implementing SARA Title III in the United States	The EPCRA program has positive impacts on community emergency planning despite having negligible funding and has increased contact among public safety orgs.	EPCRA is major shift in federal EM legislation - first time federal govt was implementing regulatory requirements without direct involvement	Adams et al. (1994); Drabek (1986); Drabek (1987); Lindell & Meier (1994); Lindell & Whitney (1995); Whitney & Lindell (1995)	SARA Title III's policy of local choice raised questions about environmental equity because poor and politically powerless communities might adopt lax safety standards to retain existing facilities and to attract new ones. (p. 173)

## APPENDIX B

### IRB Submissions and Approved Reviews

Date: 10-4-2020

IRB #: IRB-2019-350

Title: Local Emergency Planning Committee Planning and Preparedness Efforts

Creation Date: 10-21-2019

End Date:

Status: **Approved**

Principal Investigator: Laura Bobrick

Review Board: SHSU IRB

Sponsor:

#### Study History

Submission Type	Initial	Review Type	Limited	Decision	Exempt - Limited IRB
Submission Type	Modification	Review Type	Limited	Decision	Exempt - Limited IRB
Submission Type	Modification	Review Type	Limited	Decision	Exempt - Limited IRB

#### Key Study Contacts

Member	Magdalena Denham	Role	Co-Principal Investigator	Contact	mxm002@shsu.edu
Member	Laura Bobrick	Role	Principal Investigator	Contact	lcb028@shsu.edu
Member	Laura Bobrick	Role	Primary Contact	Contact	lcb028@shsu.edu

## APPENDIX C

### Electronic Survey Consent Form

#### Electronic Survey Consent Form

#### Local Emergency Planning Committee

Hello, my name is Laura Bobrick and I am a graduate student in the Security Studies Department at Sam Houston State University (SHSU). I am conducting a study under the direction of Dr. Magdalena Denham to identify planning and preparedness activities for Local Emergency Planning Committees (LEPCs). I am asking LEPC chapter members to complete a survey. The results will be reported in a thesis that I will complete as a requirement of my graduate program.

The following survey includes questions that ask you to describe your knowledge about LEPCs, including their mission, planning requirements, and legal expectations. You will also be asked to describe your opinions about your LEPC chapter's planning and preparedness activities and practices. The survey also includes questions about your occupation and resident community. It will take about 20 minutes of your time to complete the survey.

To qualify for this study, you must be over the age of 18 and have attended at least one LEPC meeting in the Greater Houston area in the calendar year.

Your survey responses will be kept confidential to the extent of the technology being used. Qualtrics collects IP addresses for respondents to surveys they host; however, the ability to connect your survey responses to your IP address has been disabled for this survey. That means that I will not be able to identify your responses. You should, however, keep in mind that answers to specific questions may make you more easily identifiable. The security and privacy policy for Qualtrics can be viewed at <https://www.qualtrics.com/security-statement/>.

Your participation in this study is voluntary. If you decide to participate, your responses will be anonymous - that is, recorded without any identifying information that is linked to you. If you have any questions regarding this survey, please contact the following:

Laura Bobrick, Principal Investigator  
Email: [lcb028@shsu.edu](mailto:lcb028@shsu.edu)  
Phone: 832-978-5735

Dr. Magdalena Denham, Research Advisor  
Email: [magdalena@shsu.edu](mailto:magdalena@shsu.edu)  
Phone: 936-294-4748

If you have any questions, suggestions or concerns about your rights as a volunteer in this research, contact the Office of Research and Sponsored Programs – Sharla Miles at 936-294-4875 or e-mail ORSP at [irb@shsu.edu](mailto:irb@shsu.edu).

I Agree - Click here to continue

I Do Not Agree - Send participant to 'Thank you' page

## APPENDIX D

### Survey Instrument

#### LEPC Member Survey

##### LEPC Membership

1. Which of the following LEPC meetings have you attended in the last 12 months?

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Austin County    | <input type="checkbox"/> Greater Baytown-Chambers County | <input type="checkbox"/> Liberty County     |
| <input type="checkbox"/> Brazoria County  | <input type="checkbox"/> Greater Harris County           | <input type="checkbox"/> Montgomery County  |
| <input type="checkbox"/> Chambers County  | <input type="checkbox"/> Greater Houston                 | <input type="checkbox"/> North Channel Area |
| <input type="checkbox"/> Deer Park        | <input type="checkbox"/> Jacinto City                    | <input type="checkbox"/> South Houston      |
| <input type="checkbox"/> Fort Bend County | <input type="checkbox"/> Jersey Village                  | <input type="checkbox"/> Southeast Regional |
| <input type="checkbox"/> Galena Park      | <input type="checkbox"/> Katy                            | <input type="checkbox"/> Tomball            |
| <input type="checkbox"/> Galveston County | <input type="checkbox"/> La Porte                        | <input type="checkbox"/> Waller County      |

2. Which of the following best describes your affiliation with a LEPC?

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Elected state or local official | <input type="checkbox"/> Public Health                    | <input type="checkbox"/> Hospital                    |
| <input type="checkbox"/> Local law enforcement           | <input type="checkbox"/> EMS                              | <input type="checkbox"/> Transportation              |
| <input type="checkbox"/> Community group                 | <input type="checkbox"/> Media                            | <input type="checkbox"/> Local environmental         |
| <input type="checkbox"/> Firefighting                    | <input type="checkbox"/> Employee of a regulated facility | <input type="checkbox"/> Municipal/county government |
| <input type="checkbox"/> Emergency management            | <input type="checkbox"/> Education                        | <input type="checkbox"/> Other: _____                |

3. Do you hold an appointed position within your LEPC (example: chairperson, information coordinator, secretary, treasurer, etc.)?

- ☐ Yes    If yes, what is your position: \_\_\_\_\_
- ☐ No

4. How many times per year does your LEPC meet?

- |                                    |  |
|------------------------------------|--|
| <input type="checkbox"/> As needed | <input type="checkbox"/> Every other month |
| <input type="checkbox"/> Weekly    | <input type="checkbox"/> Quarterly         |
| <input type="checkbox"/> Monthly   | <input type="checkbox"/> Annually          |
|                                    | <input type="checkbox"/> Other: _____      |

5. Does your LEPC notify the public of upcoming meetings?

- ☐ Yes
- ☐ No
- ☐ Don't know

6. How would you rate your familiarity of the mission and objectives of a LEPC as established by the Environmental Protection Agency (EPA) under the Emergency Planning and Community Right-to-Know Act (EPCRA)?

1      2      3      4      5      6      7      8      9      10  
 1 = not familiar at all      5 = somewhat familiar      10 = very familiar

7. Do you think that your LEPC is doing enough to prepare for chemical incidents?

- ☐ Yes  
☐ No

8. Please provide a brief explanation for your response to Question 7.

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9. Does your LEPC membership include active participation from local police, fire, civil defense, public health, transportation, and environmental professionals?

- ☐ Yes  
☐ No  
☐ Don't know

10. Does your LEPC maintain its own emergency response plan that includes information on chemical incidents?

- ☐ Yes  
☐ No  
☐ Don't know

**If you answered "Yes" to Question 10, please complete Questions 10a-10c. If you answered "No," please skip and proceed to Question 11.**

10a. How frequently does your LEPC review the emergency response plan for updates?

- ☐ Annually  
☐ Every other year  
☐ As needed  
☐ Other: \_\_\_\_\_  
☐ Don't know

10b. Who is included in the review process for the LEPC emergency response plan? Check all that apply.

- ☐ LEPC appointed officers (example: chairperson, information coordinator, secretary, treasurer, etc.)
- ☐ LEPC members
- ☐ Local government officials
- ☐ Local government employees
- ☐ Community members
- ☐ Third party sources or outside consultants
- ☐ Other: \_\_\_\_\_

10c. Is the LEPC emergency response plan distributed to community stakeholders or publicly available to view online?

- ☐ Yes
- ☐ No
- ☐ Don't know

11. Does your LEPC provide input to a county or municipality's emergency response plan?

- ☐ Yes
- ☐ No
- ☐ Don't know

12. Does your LEPC participate in any of the following activities on an annual basis? Check all that apply.

- ☐ Table-top exercise
- ☐ Specialized training for first responders and/or employees of chemical facilities
- ☐ Drill
- ☐ Public briefing on chemical incident preparedness and/or response
- ☐ Full-scale exercise
- ☐ Actual response to a chemical incident
- ☐ Other: \_\_\_\_\_
- ☐ Does not conduct any of these activities

13. Does your LEPC educate members about EPCRA requirements for emergency planning, emergency release notification, hazardous chemical storage reporting requirements (Tier I or II), and/or toxic chemical release inventory?

- ☐ Yes
- ☐ No
- ☐ Don't know

14. How does your LEPC notify the public that information on chemical hazards is available?

- |  |  |
|--|--|
| <input type="checkbox"/> LEPC website                | <input type="checkbox"/> Social media (Facebook, Twitter, Instagram, etc.) |
| <input type="checkbox"/> County or municipal website | <input type="checkbox"/> Community outreach activities                     |
| <input type="checkbox"/> Public meetings             | <input type="checkbox"/> Other: _____                                      |
| <input type="checkbox"/> Newspaper                   | <input type="checkbox"/> Don't know  |
| <input type="checkbox"/> Radio/TV                    |  |

15. Does your LEPC present information on recent chemical incidents that have occurred in your service area?

- ☐ Yes
- ☐ No
- ☐ Don't know

16. How does your LEPC collaborate with chemical facilities in your service area?

- ☐ LEPC meetings
- ☐ Meetings between first responders and facilities
- ☐ Facility tours
- ☐ Exercises/drills
- ☐ Collecting required reports
- ☐ Other: \_\_\_\_\_

17. Does your LEPC plan and prepare for other safety or security incidents besides chemical emergencies?

- ☐ Yes
- ☐ No
- ☐ Don't know

18. If you answered "Yes" to Question 17, approximately how much of your LEPC's annual planning efforts and activities are dedicated to incidents other than chemical emergencies?

- ☐ Less than 25%
- ☐ About 25%
- ☐ About 50%
- ☐ About 75%
- ☐ More than 75%

19. Does your LEPC incorporate discussion, planning, and/or activities for homeland security incidents based on current events or emerging threats?

- ☐ Yes
- ☐ No
- ☐ Don't know

20. Which of the following are obstacles to the improvement or success of your LEPC in fulfilling its required objectives regarding chemical incident planning and preparedness? Check all that apply.

- ☐ Low turnout/involvement from members
- ☐ Poor local government support
- ☐ Funding
- ☐ Lack of dedicated and knowledgeable leadership
- ☐ Limited cooperation and/or participation from regulated facilities
- ☐ Poor organization regarding meetings and communication
- ☐ Other: \_\_\_\_\_

## APPENDIX E

### Interview Instrument

#### LEPC Interview Instrument

##### Demographic Data Questionnaire

The demographic profile questionnaire is a 5-question instrument developed by the researcher. Data from the questionnaire will enable the researcher to correlate specific demographic variables with other study variables.

The questionnaire has been designed to collect the following data: affiliation with a LEPC (this may reveal occupational status), leadership within LEPC (if applicable), years involved in a LEPC, current LEPC chapter(s), and level of involvement with local emergency planning.

1. Which of the following best describes your affiliation with a LEPC?
  - Elected state or local official
  - Local law enforcement
  - Community group
  - Firefighting
  - Emergency management
  - Public Health
  - EMS
  - Media
  - Employee of a regulated facility
  - Education
  - Hospital
  - Transportation
  - Local environmental
  - Municipal/county government
  - Other: \_\_\_\_\_
  
2. Do you hold an appointed position within your LEPC (example: chairperson, information coordinator, secretary, treasurer, etc.)?
  - Yes      If yes, what is your position: \_\_\_\_\_
  - No
  
3. How many years have you been involved with LEPCs? \_\_\_\_\_
  
4. Which LEPC chapter are you currently affiliated with?
 

<input type="checkbox"/> Austin County	<input type="checkbox"/> Greater Baytown-Chambers County	<input type="checkbox"/> La Porte
<input type="checkbox"/> Brazoria County	<input type="checkbox"/> Greater Harris County	<input type="checkbox"/> North Channel Area
<input type="checkbox"/> Chambers County	<input type="checkbox"/> Greater Houston	<input type="checkbox"/> South Houston
<input type="checkbox"/> Fort Bend County	<input type="checkbox"/> Jacinto City	<input type="checkbox"/> Southeast Regional
<input type="checkbox"/> Galveston County	<input type="checkbox"/> Jersey Village	<input type="checkbox"/> Tomball
<input type="checkbox"/> Deer Park	<input type="checkbox"/> Katy	<input type="checkbox"/> Liberty County
<input type="checkbox"/> Galena Park		<input type="checkbox"/> Montgomery County
		<input type="checkbox"/> Waller County
  
5. How many years have you been involved in local emergency planning of any kind? \_\_\_\_\_

### LEPC Practices Questionnaire

The LEPC practices questionnaire asks focus group participants the similar questions used in the electronic survey. Data from the focus group will enable the researcher to perform descriptive and inferential statistics regarding members' opinions on LEPC planning and preparedness efforts for chemical incidents.

The questionnaire has been designed to collect the following data: whether LEPCs are fulfilling their intended mission as outlined by the Emergency Planning and Community Right-to-Know Act (EPCRA), how LEPCs plan and prepare for chemical incidents, what other hazards are planned for, and effectiveness of planning and preparedness activities.

1. Do you think that your LEPC is doing enough to prepare for chemical incidents? Why or why not?
2. Does your LEPC maintain its own emergency response plan that includes information on chemical incidents?
3. How frequently does your LEPC review the emergency response plan for updates?
4. Who is included in the review process for the LEPC emergency response plan?
5. Is the LEPC emergency response plan distributed to community stakeholders or publicly available to view online?
6. Does your LEPC provide input to a county or municipality's emergency response plan?
7. How does your LEPC measure the effectiveness of its planning and preparedness efforts?
8. Discuss some challenges to maintaining an active and engaged LEPC.
9. Is your LEPC leadership knowledgeable about the requirements of a LEPC under the Emergency Planning and Community Right-to-Know Act (EPCRA)? Is your membership?
10. Do you feel that the State Emergency Response Commission (SERC) provides adequate support and guidance for maintaining a LEPC and fulfilling the requirements?
11. Discuss how your local government does or does not provide adequate support for maintaining an active LEPC.
12. Does your LEPC plan and prepare for other safety or security incidents besides chemical emergencies? What type of incidents?
13. Does your LEPC incorporate discussion, planning, and/or activities for homeland security incidents based on current events or emerging threats?
14. Does an all-hazards approach to emergency management influence how your LEPC determines its planning and preparedness activities?
15. Discuss any obstacles to the improvement or success of your LEPC in fulfilling its required objectives regarding chemical incident planning and preparedness.

## APPENDIX F

### Content Analysis Code Frame

CATEGORY	DEFINITION	CODING RULES
Organization Structure	Appointed positions, formal LEPC meetings, member representation, and participation.	Content that indicates how the LEPC operates internally and its relationship to local government and industry.
Collaboration	Partnerships within LEPC, cross-agency, or interorganizational that address hazmat risks in the community.	Can include planning, training, and public outreach.
All-Hazards	Any non-chemical threats to the community, including homeland security topics.	This position can be a local government employee who serves on the LEPC or an employee of a member facility
Public Outreach	Public notification of LEPC information and activities.	Notifications regarding meetings, availability of ERP and/or hazmat information, updates from regulated facilities, review of recent incidents, etc.
Training Activities	Table-top exercises, drills, full-scale exercises, and other training addressing hazmat planning and response.	Can include planning for training or actual training that has occurred.

## **VITA**

Laura C. Bobrick

### **EDUCATION**

Master of Science student in Homeland Security Studies at Sam Houston State University, January 2018 – present. Thesis title: “Texas Local Emergency Planning Committees: Assessing compliance, proactivity, and the impact of all-hazards preparedness.”

Bachelor of Science (December 2014) in Fire Protection Engineering Technology, University of Houston-Downtown, Houston, Texas.

### **EMPLOYMENT**

EHS Supervisor and Facility Security Officer, Huntsman, January 2019 - present. Responsibilities include: conduct EHS procedure and facility audits, provide safety and security awareness training, and manage the occupational health program.

Safety Specialist, Huntsman, December 2014 - January 2019. Responsibilities include: train and manage contract security guards, coordinate emergency response at HQ, and develop safety and security policies and procedures.

EHS Coordinator, Saipem America, July 2014 - December 2014. Responsibilities include: administer general safety training, inspect and identify Life Safety hazards, and coordinate preventive maintenance needs.

Fire Inspector Intern, Harris County Fire Marshal’s Office, September 2012 – May 2013. Responsibilities include: identify code violations and plan discrepancies during inspections of facilities and assist with interpretations of Life Safety codes.

### **PROFESSIONAL MEMBERSHIP**

ASIS International, Professional Member

Board of Certified Safety Professionals

InfraGard, Houston Chapter

Montgomery County LEPC, Vice-Chair

### **PROFESSIONAL CERTIFICATIONS**

Certified Safety Professional (CSP-31552), Board of Certified Safety Professionals

Associate Protection Professional (#21630), ASIS International