SOCIAL CONSTRUCTION OF RISK ROLES, RISK PERCEPTIONS, AND EMERGENCY RESPONSE PROCEDURES: AN ETHNOGRAPHIC CASE STUDY OF TWO NEAR NEIGHBOR CHEMICAL MANUFACTURING COMMUNITIES

By

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Social perspectives on risk communication are gaining ground in a field that has been historically dominated by actuarial, economic, and psychological approaches. Through qualitative research methods, the purpose of this study was to examine how residents perceive and socially construct their risk roles related to living near chemical manufacturing facilities, explicating and expanding on taxonomy of risk roles. The study also examined and refined previously identified risk communication process variables and residents’ perceptions of community-right-to-know provisions and community emergency response measures. Based on 193 days of observation-participation while living in two communities as part of an ethnographic case study, which included 15 focus groups and 27 in-depth interviews, results of this study suggest that residents perceive their risk roles in more specific categories than previous research identified, and that residents’ sense of risk and knowledge of emergency response measures are socially constructed with emphasis on harms and benefits, control, uncertainty, and trust. This
study also suggests that sense of risk may increase with the use of sophisticated risk communication campaigns in response to community-right-to-know public policies, elevating the diligence of community residents, and that part of the community’s social construction of risk includes justification for living in the community. Also, effective risk communication campaigns were demonstrated to have a positive effect on support for industry. This analysis adds depth to the risk communication literature and suggests that public relations practitioners can and should attempt to understand risk discourse content as well as the communication processes and risk perceptions socially constructed by key publics.
CHAPTER 1
INTRODUCTION

Setting the Stage

Industrialization has been a two-edged sword. Since the latter half of the 19th century, as a result of the American Industrial Revolution, large industrial combines have served to create jobs, spawn small support and ancillary businesses, as well as create and innovate products and services that continually reshape lifestyles. Industrial combines have shifted wealth into the hands of a few, created new social classes, increased population and urbanization, formed at times poor working conditions and labor unrest, as well as fostered products, working conditions, neighborhoods, and natural environments that have at times taken advantage of and at the least strained people’s risk tolerance. Partly as a result of the advent and development of industrialization and manufacturing, governments, arts, literature, music, architecture, and man's way of looking at life, to name a few, have changed dramatically.

Among this progression, industrial refining, and specifically chemical manufacturing facilities, is one of the most significant and controversial inventions of human beings. Manufacturing facilities coordinate human and environmental resources to achieve notable and safe, and at times insignificant and hazardous, objectives. These facilities create constructive and responsible, as well as destructive and irresponsible, products and services.
Life hazards, and the collective management of those hazards, are a part of everyday existence in a modern, industrialized society. Media reports concerning hazardous materials, air and water pollutants, carcinogenic elements in our food supply, and a host of other risks bombard our attention on a daily basis. Iconic incidents such as Bhopal and Mayak internationally, and Three Mile Island and Hanford nationally, will always remind people of the dangers involved with the production, use, storage, and transportation of hazardous materials. These life hazards reflect the increasing size and complexity of modern science, technology, and industrial and chemical manufacturing.

Advances in science lead to an increase of fields that require risk management and risk communication initiatives. Biogenetics, travel, petrochemical and other specialty chemical manufacturing, to name a few, all require risk assessment and associated political and social discussions of risk communication procedures. New developments such as nanotechnology, alternate energy sources, virtual surgery and advanced space travel only increase the importance of sophisticated risk management and risk communication processes.

With the continuous expansion of products and services, however, comes the challenge of efficient production embedded in the strategic management of health, safety, and environmental risks related to manufacturing. In essence, the production and consumption of risks have become equally as if not more important than the production and consumption of goods and services (Beck, 1992).

Indeed, as Mary Douglas (1992) has argued, society is organized for the collective management of risk, which can be more functional through responsible advocacy in open contest. In this context, discussions center on communication and responsible advocacy.
Well beyond any communication model that might adequately rest on what has often been called sharing information, the sides—and there are many—engage in a marketplace of opinion through advocacy. Individuals and organizations make claims, and support and refute those claims in numerous manners. A variety of innovative communication processes have come to the forefront as companies, governmental and non-governmental organizations, and residents have engaged in dialogue intended to examine, weigh, and mitigate risks associated with work conditions, industrial processes near residential areas, and product design and use.

Community residents who live near these manufacturing facilities have legitimate reasons to be concerned for their own and others’ health, safety, and environmental quality; especially since there are no absolute standards. Alarm, anger, and outrage can result when people believe they are exposed to technologies that distress and even harm them, whether they live and labor near the risk or encounter it while using or consuming a product.

A primary motivator of community involvement and activism is people's desire to be safe and healthy coupled with their vigilance for problems of that sort which need remedying. They are sensitive to the fairness and equality of risk distribution. They do not like to bear risks that only benefit others. When organizations are seen as abusing the privileges given to them by their constituencies and other publics who affect and are affected by them, individual and community responses and governmental controls and regulations can and should sanction the capacity of organizations to continue to operate. “The emergence of the powerful consumer and the critical public is not coincidental but a symptom of the emergence of the risk society” (Jones, 2002, p. 49).
Safety, fairness, equality, and aesthetics are among the numerous motivators people use when deciding whether a problem exists that affects them and deserves their attention, including the option of making personal responses or collaboratively seeking collective solutions by engaging in public policy struggles. These motivators, among others, have been at the forefront of the public debates regarding risks over the past three decades. Translated into consideration of the benefits and harms of technologies, these motivators play a major role in the discipline called risk communication (Singer & Endreny, 1987).

Public relations, crisis management, and risk management professionals in key manufacturing industries recognized more than 20 years ago that traditional asymmetrical community relations and public education programs have a limited ability to forge effective, mutually beneficial relationships with members of the community in which manufacturing facilities operate. The Environmental Protection Agency (EPA) established risk communication as a means to open, responsible, informed, and reasonable scientific and value-laden discussion of risks associated with personal health and safety practices involved in living and working in proximity to harmful activities and toxic substances (National Research Council, 1989). Defined this way, risk management, including communication, is successful to the extent that people who fear that they may be or are demonstrably harmed by a risk can become more knowledgeable about and confident that sufficient control is imposed by the sources of the risk and by government or other external sources that are responsible for monitoring the risk generators.

Up to this point, a majority of the risk communication research has focused on a finite set of variables within linear relationships, and has not expanded the scientific
discovery to a public's sense of risk perceptions based on their interactive, social symbolic construction of reality. Some risk communication studies and prescriptions take an atheoretical approach that features an all-knowing source, with scientific or managerial credentials, who offers advice on risks to lay audiences. Covello, Sandman and Slovic (1988) designed one such treatise to assist the communication efforts of chemical plant managers. The manual advised risk communicators to relate to their audiences in dress and demeanor, to feature understandable risk comparisons, and to be attentive and personable. Such prescriptions, while important, do not address issues of conflict and negotiation, or see risk from the perspective of concerned members of the community who often believe they have reason not to trust any statement regarding risks.

In this equation, control first needs to be responsibly exerted by industry in the public interest. To the extent that such control is not proactively achieved, health, safety and environmental concerns will remain at the forefront of media and public policy discussions; community residents will continue to bear the risks of living near manufacturing facilities, outcries from community activists will continue to be fueled, and the credibility of the industry will be challenged. This is the crux of responsible advocacy – the engagement of concerned and interested parties.

This engagement is primarily communicative and as such language is indispensable. Through language, people interpret, create, share, and re-interpret perceptions of reality, including risk. With words, people internalize and externalize thoughts (Burke, 1961). Through language, people share and manage their sense of reality through social interactions. This sharing provides the foundation for cooperative behavior through social reality, which is the perception and understanding of what each
person has constructed of others' perceived experiences (P. Berger & Luckmann, 1966). In this manner, language not only helps contact, develop, and maintain social interactions, but it also plays a key role in the cognitive processes people use to describe, define, identify with, and evaluate one another and their own lives, both individually and collectively (C. Berger & Bradac, 1982).

Social symbolic interaction orientation focuses on meaning that evolves from intrapersonal and interpersonal transactions. From this orientation, meaning builds up and develops over time as individuals interact with themselves and others, comparing their interpretations with others' perspectives, and reflecting upon their similar and varied perceptions. Awareness, knowledge, attitudes, behavioral intentions, and responses to risk discourse are based ultimately on both the symbolic interaction of social construction and on attempted maintenance of familiar social identities; more complex and comprehensive than the dominant idea that (objectively existent) risks are perceived and valued according to a person's pre-existent and discrete values or interests.

Risks thus are embedded within and shaped by social relations and the continual tacit negotiation of our social identities (Wynne, 1992). Such an orientation toward risk communication adds value to organizations by increasing their sensitivity regarding how stakeholders create and manage interpretative frames related to issues that define, affect, and ultimately support or oppose organizational activities, such as supporting or imposing limits on business activities that can either be beneficial or harmful.

Strategic and ethical risk communication entails science and information within dialogic advocacy, the framing and interpretation of facts, values, and policy. Does ethical communication end with and become defined by science and public policy – that
which is legally required – or is there a higher standard to be borne by the good company/industry behaving and communicating well? In the scope and purpose of mandated community-right-to-know legislation, people are supposed to be alerted to the potentiality of a risk occurring that could affect their health, safety, or environment. Thus, responsible risk communication calls for strategic, continual, expert, honest, and ultimately effective communication about risks and the best way of responding to prevent or mitigate the risk, all framed within socially constructed risk perceptions.

Statement of Purpose

Prior to analysis, this research reviews the legacy of today’s philosophy of mandated and industry initiated community-right-to-know policies, and risk communication research and response measures. These points of analysis began to change dramatically in the mid-1980s following iconic manufacturing crises such as in Union Carbide’s MIC release in Bhopal and Three Mile Island’s nuclear generating facility accident that awakened a complacent public, alerted the media to risks, and fueled the arguments of many community activists.

The purpose of this dissertation is four-fold. The first purpose is to better understand through their own stories how near neighbor community residents perceive and socially construct their risk roles related to living near chemical manufacturing, storage, and transport facilities, explicating and expanding on Palmlund’s (1992) taxonomy of risk roles. Second, this study seeks to examine and refine, from community residents’ perspectives, four well-established risk communication process variables that have been introduced by numerous scholars including Covello and Sandman.
The third purpose is to examine community residents' awareness and understanding of two significant federally mandated and industry initiated risk communication public policies and risk management protocols. The fourth purpose is to identify a few key points of comparison of the two community residents' risk perceptions based on the level of previous and present risk communication campaigns and community-right-to-know initiatives. Within this analysis are strategic and ethical challenges for risk communication practitioners, scholars, and students. These include but are not limited to ascertaining the degree to which a risk exists, learning to manage that risk within tolerable limits, ascertaining those limits, understanding the perceptions of risk bearers through dialogue, adjusting policy and operational standards as warranted, and communicating with key publics about those risks by framing the discussion from their own unique perspectives.

This dissertation seeks to expand risk communication research in the direction of qualitative research methodologies as an important best research practice to understanding community risk perceptions, which should be able to help ground risk communication research as a community infrastructural, multiple stakeholder perspective that includes but does not limit the eye of analysis to organization-centric (e.g., corporate) perspectives. Such an approach can help public relations and risk communication practitioners develop models and strategies to create open, effective, and dialogic risk communication protocols that will benefit community residents and other personal stakeholders and stakeholders, the corporations and industry, associated health and environmental agencies, local governments and other regulatory agencies, and risk management and emergency response personnel. A commitment is vital since public
relations practice and scholarship should be interested in the processes of the practice and the ability of practitioners to listen, respond, take stands, and seek collaborative decisions in light of the risk perspectives expressed by their publics.
CHAPTER 2
BACKGROUND AND LITERATURE REVIEW

Risk Analysis, Perceptions and Communication

The Superfund Amendment Reauthorization Act of 1986 (SARA), Title III, Section 313, requires companies to provide public information concerning chemical emissions; in so doing this act gave a new scope and purpose to risk communication. Since passage of that law, much academic and professional research has explored the underpinnings of risk communication, and many tenets, taxonomies, models, and theories have been developed to explain and help implement risk communication strategies. Risk communication is grounded in various academic and applied orientations. These include an actuarial approach utilizing statistical predictions, a toxological and epidemiological approach including ecotoxicology, an engineering approach including probabilistic risk assessments, an economic approach including risk-benefit comparisons, a psychological approach including psychometric analysis, and cultural and social theories of risk (Renn, 1992a).

The literature distinguishes two types of risk communication. One form centers on an individual whose medical history and/or personal health practice puts him or her at risk. This category of risk communication and the appropriate risk responses it seeks start with experts who determine health/safety related risks and suggest ways in which people can alter their awareness, knowledge, attitudes, and behaviors to lead a more healthy and less risky lifestyle. Typical strategies include informing and persuading
targeted audiences to adopt attitudes and take actions that reduce their risk or the risk of persons close to them. Typical tactics of this version of risk communication can include recommended diet guidelines, safe sex education materials, and buckle up for safety public education campaigns.

The assumption is that people often tend to underestimate the level of risk associated with their behavior. Once they realize that level of risk and know what to do to reduce it by changing awareness, knowledge, attitudes, and behaviors, they will do so at the recommendation of risk management experts, such as physicians and public health officers. Such a statement captures the essence of that form of risk communication even if it over simplifies the challenge. In this case, risk communication is used to inform such people of the risks they take and to suggest preventative measures they can follow to reduce the risks to their health and safety.

The second kind of risk communication typically involves large organizations, such as chemical manufacturing facilities or nuclear waste remediation facilities, whose activities can pose a risk to community residents. Companies and governmental agencies attempt to share information provided through credible sources to interested stakeholders. Activism may result when stakeholders band together to pressure companies and governmental agencies into improved performance that reduces risk. The paradigm is to address and often allay the apprehensions and provide information to people who underestimate or over-estimate the degree to which they are at risk because of what an industrial interest or governmental agency does or says.

The assumption is that people in key communities need to understand the levels of risks that they suffer from working or living in proximity to them. They can take
measures that would reduce their risks; they need to understand the prevailing risk and collectively take actions so that it is reduced to or does not exceed tolerable levels. It is this latter type of risk communication that is the focus of this dissertation.

Overall, risk communication is a new and emerging area of public health communication research, and is one of the fastest growing parts of public health education literature (Covello, von Winterfeldt, & Slovic, 1987; National Research Council, 1989). It is both the natural and the manmade hazards in which risk communication has been the most developed (R. Kasperon & Stallen, 1991).

**Evolution of Risk Communication**

The history of risk management and risk assessment can be traced back beyond Greek and Roman times (Covello and Mumpower, 1985). The origins of risk analysis have been traced to the Babylonians in 3200 BC where myths, metaphors, and rituals were used to predict risks and to communicate knowledge about avoiding hazards; risk communication was embedded in folk discourse (Krimsky & Plough, 1988).

Formal risk analysis was developed in the early part of the 20th century by engineers, epidemiologists, actuaries, and industrial hygienists, among others, who looked at hazards associated with technology that was rapidly developing from and during the industrial revolution (Kates and J. Kasperon, 1983). The development of probability theory during the 17th century in Europe brought explicit formulations of risk concepts. Federal legislation in the 1970s, including the formation of the EPA, elevated the role of formal risk assessment. The increasing use of risk analysis in the industry and the regulatory process created some legitimacy and resources to the study of risk as a field of science for academicians (Lind, 1987).
Explicit, modern-era interest in risk communication can be traced back to the 1950s and the "Atoms for Peace" campaign. The later development of the anti-nuclear movement in the 1970s helped bring risk communication to the limelight (R. Kasperson & Stallen, 1991). Nevertheless, the study of risk communication as a distinct social phenomenon is relatively new (Krimsky and Plough, 1988). Prior to 1986, there was a limited amount of scholarly research about risk communication. Since then, scores of titles with the term "risk communication" have appeared in journals, magazines, and other published literature, along with conferences, presentations and special sessions in scientific meetings and federal oversight hearings.

If exposure to risk is not new, then why is there a renaissance in risk communication research and communication? According to Fischhoff (1990), "what is new in their [government’s] response to the risk of modern technologies is their [stakeholders’ and general public’s] insistence on having a role in deciding how those risks will be managed" (p. 84).

Another reason for the expansion of risk communication is people’s feeling of entitlement; key publics hold government and business officials accountable for their policy decisions and actions (Fischhoff, 1985). Public distrust of government officials is readily apparent. Officials often operate on the assumption that they and their audiences share a common framework for evaluating and interpreting risk information (e.g., Covello, 1992; Krimsky & Plough, 1988). This distrust also stems from the fact that prominent government officials often take opposing viewpoints about health, safety, and environmental risk matters and participate in highly public debates about risk estimations (Krimsky & Plough, 1988; National Research Council, 1989). Juanillo and Scherer
(1995) noted this decline of the public’s confidence in the ability of government and industry to act responsibly in risk assessment and risk management. This lack of confidence has created a public that is no longer the passive receiver of risk information. “Large segments of the public now demand more involvement in debates over risk issues and challenge conclusions and recommendations from scientists and experts” (p. 292).

Covello and Mumpower (1985) and Leiss (1996) have written extensively on the history of risk communication. Several events highlight the development of both the research and practice of risk communication science. Early risk research was conducted throughout numerous branches of the federal government, including the EPA, the Food and Drug Administration, the Nuclear Regulatory Commission, and the Department of Energy. The focus of funding on social and communication perspectives toward risk was advanced primarily by the EPA, with additional research funding from the National Science Foundation (NSF).

One of the turning points in the study of risk communication was in March 1979 when the U. S. House Committee on Science and Technology requested that the NSF develop the Technology Assessment and Risk Analysis Program for evaluating long-term comparative risks for alternative technological solutions to issues such as energy, materials, environmental quality, food, and drugs (U.S. Congress, 1979). This program strengthened the NSF’s attention and focus toward risk analysis and risk communication. The Ethics and Values Studies in Science, Technology and Society (formerly the Ethics and Values in Science, Technology Program) also funded a large number of risk management and risk communication research projects since the mid-1970s.
Another turning point in the study and practice of risk communication was the founding of the Society for Risk Analysis in 1980. The major aims of this society are to promote knowledge and understanding of risk analysis techniques and their applications, improved communication and integration among risk scholars, and the advancement of all aspects of risk analysis, including risk communication (Golding, 1992).

Along with the Society for Risk Analysis, numerous social science academic centers began to focus on the study of risk. Beginning in 1963 with the Disaster Research Center at the University of Delaware through the development of the Center for Risk Analysis in 1989 at the Harvard School for Public Health to one of the newest risk communication centers at the University of Georgia, these academic programs have focused on risk not only from a risk management perspective, but also from a social and communication perspective.

From a regulatory perspective, risk communication officially began with marketing by the EPA and the organizations it regulates. Beyond systems and regulatory standards, risk communication grew out of risk perception and risk management studies. Risk perception is a social science approach, as well as a mathematical, probabilistic analysis of the coorientation people have in regard to what they perceive to be risks in comparison to the analysis of actual risks that are performed by risk management experts.

Risk perception studies primarily focus on two issues: what are the probabilistic assessments of risks prepared by risk management experts and what factors influence the way in which different categories of individuals perceive risks? The central worry in risk perception studies is the tendency of laypersons to be inaccurate in their ability to assess properly the likelihood that certain risk events will occur and if they occur, whether they
will lead to negative or positive outcomes. The issue to be managed is how to understand and control risks, as well as gain acceptance for these measures in ways that foster the wisest outcomes in any community of interest (Freudenberg, 1984). As Krimsky (1992) noted:

The field of risk studies grew out of the practical needs of industrialized societies to regulate technology and to protect their citizenry from natural and technological hazards. From its inception the study of risk was positioned at the intersection of academic, governmental, and industrial interests. (p. 8)

In their struggle to control risks, people seek and contest facts, and evaluative premises and conclusions to be derived from those facts and premises. Risk management is the root discipline. It takes a highly positivistic approach to risk calculation and abatement.

As a discipline, risk analysis blends many scientific disciplines such as engineering, toxicology, industrial hygiene, and epidemiology. Principal assumptions and methodologies are derived from actuarial studies. One fundamental incentive of risk management is to use scientific methodologies to calculate the risk exposure accurately that various categories of people suffer because of their lifestyle activities, work practices, and their proximity to sources of risks in their communities. Controversy often surrounds the means for assessing the level of risk in a community or workplace. Conflict centers on methodologies, assumptions, and values about which experts and community members at risk disagree. Starr (1969) proposed that patterns of acceptable risk/benefit compromises can be inferred from historical data on deaths and economic benefits for various technologies. Advocates reason that, over time, society arrives at an "essentially optimum" balance between risks and benefits associated with an activity (p. 1233). Supporters of this "revealed preference" method maintain that data can be used to reveal patterns of risk-benefit tradeoffs acceptable to the public.
As a technical concept, risk is conventionally defined as something that can be given a numerical value by multiplying the probability of an outcome (typically one with negative consequences) by its severity. This expectancy value is used to estimate and compare risks (Hanson, 1989) that are perceived differently depending on the heuristics and biases each person uses to judge them (Tversky & Kahneman, 1986).

Concerned that residents rely on invalid assumptions, Fischhoff, Slovic, Lichtenstein, Read and Combs (1978; Covello, 1983; Slovic, 1987) initiated "expressed preference" research, which involves measuring a wider array of attitudes than benefits to ascertain tolerable risk levels. These researchers found laypeople's risk ratings, unlike those of experts, are not just influenced by fatality estimates but also by their judgments of several qualitative factors. Of particular note, the lay public evaluates an activity or technology as more risky if it is involuntary, unfamiliar, unknown, uncontrollable, controlled by others, unfair, memorable, dreaded, acute, focused in time and space, fatal, delayed, artificial, and undetectable, as well as if individual mitigation is impossible.

Researchers have used this approach to explain why the lay public shuns risks such as use of nuclear fuel to generate electrical power, a technology experts find acceptably safe (Otway, Maurer & Thomas, 1978), and why homeowners ignore risks such as radon that scientists rate as hazardous (Sandman, 1986).

As such, there is no single psychology or sociology of risks; risks must be looked at and dealt with in a variety of manners. Each society has its own list of risks that are believed worthy of concern. "Each society highlights some risks and downplays others; and each society institutionalizes means for controlling some risks and not others... Risks are exaggerated or minimized according to the social, cultural, and moral
acceptability of the underlying activities" (Brehmer, 1987, p. 28). Risks are not necessarily selected and perceived due to their scientific merit, but out of a combination of social and cultural factors, denotative and connotative reasons.

For example, Sandman (1986) and Sandman, Weinstein and Klotz (1987) suggested that the thing best known about risk communication and risk perception is that people and society make risk decisions less in terms of the hazard and more by what they call the outrage factor, which deals with issues of fairness and familiarity. It asks who has the control or trust, are they taking my concerns seriously, and are they listening to me? Sandman (1986) argued that it is well established that individuals are more worried about outrage than hazards. He takes this concept further by stating that social policy is based more on outrage (perceptions) rather than the actual hazards. Once researchers became aware that risk perception was a vital factor in risk management, attention turned from actuarial analysis to the development of lists of factors that appear to be fundamental to risk perception.

Risk communication has progressed beyond a source-oriented approach to a risk perception and a risk management approach. At its birth, risk communication took on a source-oriented, linear approach that privileged the "knowledgeable source" as the key participant in the process. Typical of the theme that characterized the source-oriented era is Covello's (1992) view of risk communication "as the exchange of information among interested parties about the nature, magnitude, significance, or control of a risk" (p. 359). Risk communication involves "the act of conveying or transmitting information between interested parties about levels of health or environmental risks; the significance or meanings of such risks; or decisions, actions, or policies aimed at managing or
controlling such risks" (Davies, Covello & Allen, 1987, p. 112; see also Covello et al., 1987; Covello et al., 1988).

Leiss (1996) called this the technical risk assessment period. In this period, industrial spokespersons were advised to appease or assuage the publics' apprehension by being credible and clear; it featured the role and work of experts who conducted epidemiological studies to ascertain whether risks exist. Typical of this view, the EPA's (1988) “seven cardinal rules of risk communication” advised communicators to tailor their messages to audiences and to use:

[S]imple, non-technical language. Be sensitive to local norms, such as speech and dress. Use vivid, concrete images that communicate on a personal level. Use examples and anecdotes that make technical risk data come alive. Avoid distant, abstract, unfeeling language about deaths, injuries, and illnesses. (p. 4)

The advice assumes that "if people are sufficiently motivated, they are quite capable of understanding complex information, even if they may not agree with you" (p. 5).

Part of the technical risk assessment period was the original work done by the National Research Council (1989) that emphasized the dissemination of information and featured potential outcomes. It treated risk communication as:

[A]n interactive process of exchange of information and opinion among individuals, groups, and institutions. It involves multiple messages about the nature of risk and other messages, not strictly about risk, that express concerns, opinions, or reactions to risk messages or to legal and institutional arrangements for risk management. (p. 21)

Accordingly, risk communication is "successful only to the extent that it raises the level of understanding of relevant issues or actions and satisfies those involved that they are adequately informed within the limits of available knowledge" (p. 21).

Risk communication progressed through a period during which experts advised organizations that pose health, safety, or environmental risks to assuage employees and
community members' apprehensions by being credible and telling the truth. The truth was to be based on the known likelihood of each risk's occurrence and the magnitude of its effect. The second phase of risk communication featured a more interactive approach: "We see risk communication as the interactive process of exchange of information and opinion among individuals, groups, and institutions" (p. 2). This definition suggests a movement from an asymmetrical approach of communication and decision making toward what J. Grunig (1992) defined as two-way symmetrical communication.

Is being informed the goal of risk communication? That seems to be a limiting sense of the total process. What about the abatement of risks thought to be intolerable? What about the values that guide assessments of when each risk is tolerable? What about the socio-political forces that bring a balance in each community between personal and organizational interests? Questions such as these suggest that factors are missing from this definition, particularly the desire on the part of key publics to control politically intolerable risks – their source, their likelihood, or their consequences.

One traditional weakness in this design of risk communication is the assumption that people receive most of what they know about risks and learn to respond to them by watching television, reading a newspaper, listening to radio, or accessing the Internet. A mass-mediated approach to the diffusion of risk information can fail to acknowledge the important role of conversation and interpersonal exchanges with friends and relatives (Gay & Heath, 1995; Heath & Gay, 1997; Juanillo & Scherer, 1995). Operationally risk communication is an interpersonal, organizational, and mass-mediated dialogue.

Previous models of risk communication predict that if people receive credible and clear information regarding scientifically assessed risk levels, they will accept the
conclusions and policy recommendations of risk assessors. These models over-assume the power of information and do not acknowledge the power resources that concerned publics employ to exert political pressure in their effort to impose higher operating standards on the source of the ostensibly intolerable risk. The view assumes that "if people are given the facts their subjective perceptions will begin to align with scientific judgments" (Liu & Smith, 1990, p. 332). That perspective reasons that if laypeople understand the company or government's side of the story, then confidence about risk would increase and complaints would go away (Gaudino, Fritsch & Haynes 1989).

Continuing his summary of the discipline's history, Leiss (1996) identified a third phase, the current version of risk communication that features social relations. Risk communication based on a shared, social relations, community infrastructural approach works to achieve a level of discourse that can treat the content issues of the risk-technical assessment – and the quality of the relationships along with the political dynamics of the participants.

Hadden (1989) observed crucial differences between what she defined as the old and new versions of risk communication. In the old approach "experts tried to persuade laymen of the validity of their risk assessments or risk decisions." This option is "impeded by lay risk perception, difficulties in understanding probabilities, and the sheer technical difficulty of the subject matter" (p. 301). In contrast, the new approach is based on dialogue and participation. According to Otway (1992):

Risk communication requirements are a political response to popular demands.... The main product of risk communication is not information, but the quality of the social relationship it supports. Risk communication is not an end in itself; it is an enabling agent to facilitate the continual evolution of relationships. (p. 227)
People often decide what levels of risk are acceptable not based on technical data analysis, but rather on a question of value, such as fairness (Krimsky & Plough, 1988). Perceived risk has a structure that differs from the structure of expert judgments about risk (Brehmer, 1987). This and other more recent approaches to risk communication highlight the importance of a dialogic, relationship-building approach to dealing with the concerns and perceptions of community residents and employees.

The new form of risk communication, however, is often impeded by the lack of institutions that are responsive to the needs, interests, and level of understanding of the publics affected by the potential or ostensible risk. Hadden (1989) found that institutional barriers stand in the way of meaningful dialogue in communities where people experience risks that they worry are intolerable. Such barriers result, at least in part, from statutes that do not specify what technical data are crucial and, therefore, should be collected. People often encounter a maze of agencies, do not know where to acquire information, and suffer data dumps that provide huge amounts of information in ways that make it difficult to interpret.

**Risk Communication Orientations**

A variety of theoretical orientations have guided the study of risk communication, building on different perspectives of risk taxonomies towards orientations and approaches toward risk research. A brief review of the more salient theoretical orientations provides grounding for understanding and categorizing the literature. These include: quantitative laws, static taxonomical frameworks, system models/theories, causal models, process models, functionalist explanations, cognitive explanations, rationale actor concept, social
mobilization theory, organizational theory, neo-Marxist theory, critical theory, and functionalism.

Quantitative laws numerically analyze how to communicate and were one of the early approaches to risk communication. Though quantitative laws failed to withstand the scrutiny of science, a few posit quantitative relationships were advocated. For example, Starr (1969) argued that risk acceptability and benefits can be figured accordingly: the acceptability of risks appears to be roughly proportional to the third power of the benefits.

Static taxonomical frameworks provide a conceptual template that provides structure to a field of study. The taxonomy provides no causal process, but rather provides categorical structures that stimulate inquiry; their value lies in suggested lines of inquiry and distinctions about modes of social behavior. For example, risk can be divided according to the nature of the hazard, medium of exposure, level of exposure, benefits, costs, communication tools, media, regulatory agency, or public policy. Slovic, Fischhoff and Lichtenstein’s (1985) risk characteristics remain one of the more lasting taxonomical frameworks.

Krimsky (1992) described three more approaches to social risk studies. Systems models represent the dynamical processes, relationships among parts within actions and reactions. Risk models do not necessarily relate to causal factors underlying the component of systems. Systems models have little predictive power but allow broader systems appreciation of the risk being studied. Kates and J. Kasperson’s (1983) model describing how humans adjust to natural hazards provides some understanding of human risk adjustment though with little predictive value. Causal models, on the other hand, are
a set of generalized principles in the form of a law, where risks are either deterministic or probabilistic. The strength of causal models allows for the prediction of events, behaviors or other actions. Process models provide an ordered set of rules or procedures that define an approach to an issue or problem. Process models define a prescriptive approach. The National Research Council (1989) developed a widely accepted process model for the social management of risk that identified four stages: hazard identification, risk estimation, risk evaluation, and risk management/communication.

One of the more common and particularly useful perspectives of risk communication is cognitive explanations. Categories of human thought or behavior are often used to account for awareness, knowledge, attitudes, beliefs, behavioral intentions, and behaviors. This cognitive or psychometric perspective toward understanding risk has been important to the development of risk communication studies, though it lacks embedment in broader social and cultural contexts.

Rationale actor concept, related more toward economic analysis of social behavior, is social actions that are seen as a result of deliberate actions by social actors to promote their interests (Dawes, 1988). From this concept, individuals and groups experience conflict as perceived risks, which can affect their interests, and each group will mobilize to take action. According to Stallings (1987), individual and group behaviors are governed by strategies to formulate the ideal way to address conflicts that result from the perceived or actual risks.

In a somewhat similar strain of thought, social mobilization perspectives focus their research on two critical aspects of risk resolution – circumstances in which individuals and groups are motivated to take action (McCarthy & Zald, 1977) and the
conditions necessary for the social groups to succeed in these actions to mitigate risk. An organizational theory focuses on the routine and structure of tasks and the diffusion of the responsibilities to address the tasks. A large amount of this research has focused on management within organizations in risk reduction and risk communication (e.g. Clarke, 1989; Perrow, 1984).

Neo-Marxist and other critical perspectives focus on the normative aspect of freedom from risks as opposed to an explanation of risk experience (Renn, 1992a). According to Habermas (1984) and Forester (1985), such critical approaches share the objective part of the rationale actor approach but rely on structural analysis for determining institutional interests and social group behavior.

Last, functionalist perspectives look for explanations that can provide an understanding of parts to the whole, demonstrating how the parts (e.g., individual community residents) support and affect the whole (e.g., culture of the community). The role of functional explanation has been described as:

[T]he explanation of anthropological facts at all levels of development by their functions, by the part which they play within the integral system of culture, by the manner in which they are related to each other within the system, and by the manner in which the system is related to the physical surroundings. (Nagel, 1961. p. 52)

For example, Plough and Krimsky (1987) analyzed the different functions of technical rationality (science) compared to cultural rationality (needs of community) in providing insight to risk perception.
Risk Communication Challenges

From the brief historical and orientations appraisal, views of risk communication have evolved from at least three separate streams of thought to guide the way risks are calculated, evaluated, perceived and controlled:

a) Scientific positivism, whereby data and methodologies of scientists dominate community efforts to ascertain the degree or risk and subsequent communications about the risk on behalf of the community;

b) Constructivism/relativism, which assumes that everyone’s opinion has equal value so that no opinion is better or worse than anyone else’s; and

c) Dialogue that through collaborative decision-making, scientific opinion becomes integrated into policies which are vetted by key public’s values.

Renn (1992b) observed that a positivistic/objective approach fails to account for cultural differences, whereas the relativism of constructivism leaves the decision-making process "with no anchor for baseline comparison" (p. 179). Relying on the data at hand that they believe to be convincing and that confirms their predilection to support or oppose the source of risk, "social groups in a political arena try to maximize their opportunity to influence the outcome of the collective decision process by mobilizing social resources" (p. 180). If they opt for political activism, rather than a purely scientific approach to risk assessment and abatement, "individuals and organizations can influence the policy process only if they have sufficient resources available to pursue their goals" (p. 181). Activists seek to have rules accepted and promulgated based on their values. In the absence of self-regulation by the ostensible source of risk, people turn to enforcement agencies to enforce the rules. "To be successful in a social arena, it is necessary to mobilize social resources" (p. 184). This is true both for responsible companies seeking community support and for activists working to wield their influence.
Responsible risk communication at first glance appears relatively straightforward. The elementary question seems to be this: how can spokespersons best develop and deliver targeted, data-driven risk messages as well as engage in symmetrical dialogues to reduce or increase key publics' awareness and knowledge of issues related to risk concerns, and ultimately increase key publics' positive health and safety actions?

Risk messages can be confusing because they come from a variety of media sources (can labels, public meetings, newsletters, and media) that involve a multitude of parties and often reflect competing scientific conclusions (Covello, 1992; Covello & Johnson, 1987; Krimsky & Plough, 1988; National Research Council, 1989). Experts and regulatory agencies often operate on the assumption that they and their audiences share a common framework for evaluating and interpreting risk information (Covello, 1992; Krimsky & Plough, 1988). This confusion also stems from the fact that prominent government officials take opposing viewpoints about environmental risk matters and participate in highly public debates about risk estimations (Krimsky & Plough, 1988; National Research Council, 1989).

In this mix of players, technical experts, whether or not they are employed by the industry that produces the risk, can play a vital role in community-based risk assessment because they are a key node in the dissemination and interpretation of technical data, even though their perceptions of risks may differ from those of the lay public (Heath & Gay, 1997; Palenchar & Heath, 2002; Thomas, Swaton, Fishbein & Otway, 1980). Studying this issue, Thomas et al. (1980) found policy makers more favorably inclined than the lay public toward the use of nuclear energy primarily because policy makers did not link the technology with psychological risk. At the same time, laypersons do not act
irrationally even though they may appear to do so; they tend to use a different rationality than do risk experts (Wandersman & Hallman, 1993). Fischhoff et al. (1978) found that laypeople incorporated considerations besides annual fatalities into their estimates of risk. Oftentimes their risk perceptions were unrelated to their own fatality estimates.

These are just a few of the infinite number of risk communication challenges.

Otway (1992) featured this complexity of risk communication:

Risk communication requirements are a political response to popular demands . . . The main product of risk communication is not information, but the quality of the social relationship it supports. Risk communication is not an end in itself; it is an enabling agent to facilitate the continual evolution of relationships. (p. 227)

Public relations is a practitioner and scholarly discipline increasingly devoted to understanding the quality of relationship construction, maintenance, and repair. For this reason, practitioners and scholars have reason to understand variables that affect the risk communication process.

As Fischhoff (1995) has modeled the risk communication process, it can be viewed as developmental: getting the numbers regarding risks correct, putting those numbers into a community at risk, explaining what is meant by them, showing that members of the community have accepted similar risks, showing the benefits of risks, treating the public with respect, and creating partnerships to understand and properly control risks. The strongest component of this progression is the creation of meaningful partnerships that respond to the concerns and needs of community members for information and bringing collective wisdom and judgment to bear on that problem. This stress on "we" gives a community grounding for two-way symmetrical communication and partnership development (Chess, Salomone, Hance & Saville, 1995).
Responsible Advocacy

From this community infrastructural perspective toward risk communication, risk assessors and communicators realize that each key public makes an idiosyncratic response to each risk based on unique decision heuristics. Each public has an inclination to engage in or at least support activism to exert public policy solutions to correct intolerable risk perceptions. Appreciating and working with idiosyncratic responses to risk is also an ethical challenge within responsible advocacy.

Philosophers and scholars have defined ethics as the study of what is right or wrong, fair or unfair, just or unjust. Others have argued that ethics is in essence morality. Within the field of public relations, numerous scholars and practitioners study and advocate various perspectives of viewing or incorporating ethics into the study, pedagogy, and practice of public relations. Fitzpatrick and Gauthier (2001), for example, reviewed previously suggested theories of public relations ethics ranging from attorney-adversary to the two-way symmetrical model, ultimately modeling their own professional responsibility theory of public relations ethics that is based on practitioners’ dual obligations to serve client organizations and the public interest. Such models can range from Aristotle’s golden mean, to utilitarian considerations and Kantian moral imperatives.

One model that receives considerable attention is the two-way symmetrical model. J. Grunig and White (1992) noted that “public relations should be based on a worldview that incorporates ethics into the process of public relations” (p. 57), while J. Grunig and Hunt (1984) summarized that public relations and social responsibility are interconnected. “Public relations managers should be ‘inside the door’ of management in
all kinds of organizations where they can provide internal social reports on the organization's public performance” (p. 59).

Within risk communication, the ethical dilemma may lie within people’s struggle to control risks, seek and responsibly contest facts, evaluate premises, and form conclusions derived from those facts and premises. The ethical risk communication dilemma is no different than the management dilemma; the challenge is how to understand, manage and control risks, as well as gain acceptance for these measures in ways that foster the wisest outcomes in any community of interests (Freudenberg, 1984).

According to Heath (2001):

Corporate actions are evaluated by key publics. For this reason, corporate social responsibility is value-informed choice making. Ascertaining appropriate ethical responses is a rhetorical problem vital to strategic planning used by excellent organizations that aspire to build and maintain mutually beneficial relationships. Public relations persons enjoy an ideal position to counsel executives on which values fit best with the interests of their markets, audiences and publics. (p. 46)

Responsible advocacy occurs when senior counselors make a case that reflects the arguments and claims of concerned citizens and employees. This is an internal voice for external interests.

Concern centers on organizational strategies that abide by the organization’s standards of ethics and resulting behaviors that are perceived and recognized by stakeholders and the market as credible, ethical, and positive. These standards should be based on genuine attitudes and actions of the organization, rather than an image that is inconsistent with organizational operations. “The character of this market recognition is therefore largely one of social agreement, i.e. one constructed by shared communication” (Spicektt-Jones, Kitchen & Reast, 2003, p. 69). This perspective is consistent with Pearson’s (1989b) contribution to public relations ethics that maintaining a
communication relationship with the public is essential and that the quality of those relationships is improved through dialogue.

**Risk Communication Process Variables**

A review of key risk communication process variables is warranted before examining the specific questions addressed in this study. Risk management, perception and communication research addresses five themes: likelihood specific risks will occur, who will be affected if they occur, magnitude of effect, mitigation of the occurrence, and mitigation of impact. Each of these themes has a technical and a perceptual dimension. Technical dimensions are those that yield to management and engineering decisions that change probabilities. Perceptual dimensions are those that result from feelings and beliefs citizens use to ascertain the likelihood of risks and their potential impact. To address and respond to these coupled issues, industries and governments study risk communication process variables imbedded in prevention and emergency response measures to reduce the likelihood the risk will occur, lessen the likelihood that specific people will be affected, and help those people to take action that can reduce the impact of an event on their health and safety.

Several public relations researchers (e.g., J. Grunig, 1992; Kruckeberg & Stark, 1988) initiated a paradigm discussion of the role that the concept of community could play in the application and study of public relations. A variety of research and best topics practices have outlined the central importance of community and relationship. Within risk communication studies, most of the research regarding the concept of community has developed from a corporate, scientific or regulatory perspective, such as trying to get community feedback (Braman, 1980), reducing fears by bringing people into the
community relations process (Price, 1994), and involving citizens to increase organizational credibility (Arnstein, 1994).

Recently, examination of the evolving nature of the relationships between an organization and its key publics has emerged as a rich area of public relations scholarship, and specifically the orientation that public relationship can be viewed as the management of relationships between an organization and its stakeholder groups (Ledingham & Bruning, 2000). Several leading public relations researchers (e.g., J. Grunig, L. Grunig, Hon) have focused particular aspects of their research agendas on organization-public relationships from the perspective of related disciplines such as interpersonal communication, organizational communication, and sociopsychology to identify key characteristics of relationships and to identify and develop measures of the quality of long-term organization-public relationships (J. Grunig & L. Grunig, 2001).

Two relationship orientations dominate the examination of public relations outcome variable research and literature: economic and humanistic. The economic orientation views relationships through costs and benefits accrued, while the humanistic orientation highlights the cognitive and emotional structures in relationship management.

Several different typologies of public relationship outcome variables identify trust, mutuality, commitment, and satisfaction as the most essential features (e.g., Bruning & Ledingham, 1998). Hon and J. Grunig’s (1999) taxonomy of perceptions of an organization’s relationships with key constituencies focuses on six elements: control, trust, satisfaction, commitment, exchange relationship, and communal relationship.

Overall, the relationship management perspective shifts the practice of public relations from the management of public opinion to the management of constructing,
maintaining, and expanding organization-public relationships (Ehling, 1994). According to Bruning & Ledingham (1998), this shift is fundamental for public relations evaluation in determining the influence that organizational activities have on stakeholders’ perceptions of the organization-public relationship and determining the outcomes of organizational activities on stakeholders’ behaviors.

In a similar research vein within risk communication, numerous scholars have slowly developed a typology of variables. Heath and Abel (1996) introduced an early model that included variables such as uncertainty, trust, information seeking, and cognitive involvement. According to Covello (1992), central factors in risk perception are catastrophic potential, familiarity, understanding, uncertainty, controllability, voluntariness of exposure, effects on children, effects manifestation, effects on future generations, victim identity, dread, trust in institutions, media attention, accident history, equity, benefits, reversibility, personal stake, and origin.

For example, catastrophic potential is the product of estimations that substantial environmental damage may occur or that many individuals or animals will be harmed or killed at the same time as a consequence of the risk. Familiarity is a function of the extent to which people routinely encounter the risk. Understanding is the extent that experts or laypersons comprehend the mechanisms that result in the risk or its consequences. Voluntariness of exposure addresses the concern that people have regarding how they become exposed to the risk: whether they opt to be exposed to it rather than if they are forced to suffer its occurrence or consequences against their will. When a risk has harmful effects on children, it is viewed as being less tolerable than if it affects older people. Another concern is how the effects are manifested – immediate or delayed. Impact of a risk can be immediate, but uncertainty increases as people attempt to predict its effects on future generations. Risk management experts attempt to reduce uncertainties to probabilities that some persons out of a population will suffer.

Increased media attention can magnify the degree to which people think a risk is in play. Risks are assessed according to accident history, their recurrence and consequences. Equity is an important dimension of risk because minority racial groups and lower socioeconomic levels may experience disproportionately greater risks. Risks are not without benefits; a balancing act of risk assessment is to determine whether the positives associated with the risk outweigh the harms and whether the benefits are clearly recognized. A risk is thought to be less tolerable when its effects are irreversible. If people have a personal stake in a risk, they respond differently than if they do not. As people assess risks they calculate the origin – whether natural or the product of human efforts – and respond accordingly.
Variations of the typologies of risk communication process variables abound. All the preceding variables have been documented as part of the risk communication process. For the purpose of this study, however, the following five risk communication process variables were highlighted in community residents' discussion of risk perceptions and risk management protocols: knowledge, harms/benefits, uncertainty, control, and trust.

Knowledge

Knowledge is one of the most problematic variables in this analysis. One underpinning assumption in risk assessment is that experts can obtain scientific knowledge about the degree to which a risk exists, use that knowledge to properly abate the risk, and supply concerned publics with the details of the risk and means for its abatement. The assumption is that once key publics receive technical information they make informed decisions and their concern will lessen. Advocated by the EPA, this focus leads it to require scientific analysis and reporting by thousands of companies and government agencies.

Despite its intuitive logic, there are flaws in relying solely on this approach. For example, people who work in an industry or who live closer to the risk tend to be more knowledgeable (Baird, 1986); knowledge is unevenly spread throughout a community. A risk management view of risk assessment and communication postulates that knowledge of risks – a positivistic approach assuming scientific knowledge – is the foundation for allaying apprehensions about risks. Knowledge is a residue of the information people have obtained and decision heuristics they have acquired to process that data. To ask them what they know is to have them report the residue of information, but not to assess how they reason or make decisions with it. The amount of information that a message
contains depends on its impact on the person who considers it; the amount of information is the difference between the degrees of uncertainty the person experiences before and after receiving the message (Krippendorff, 1975). This definition is fundamental to the assumption of information integration theory that a belief is a subjective probability—the degree of certainty—that a person associates any trait or evaluative attribute with an object, situation, or behavior. This theory has demonstrated that an attitude is the product of positive data integrated with negative data (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975).

The perplexing aspect of knowledge about sources of risks and the harms they may create is the absence of compelling evidence that knowledge of technical aspects of an issue accounts for much of the support or opposition that people express in regard to it. Baird (1986) found that factual knowledge basic to risk estimates did not predict tolerance of emissions from a lead smelter. He concluded that people tolerate levels of risk for reasons that may have little or nothing to do with factual details, formal risk estimates, or details of risk management proposals. Even though smelter employees faced the greatest arsenic exposure of all respondents, they were less likely to view the smelter as a personal health hazard and were more likely to voice confidence they would not become ill from its emissions. Although those who were less tolerant of the hazard had more information about it than those more tolerant, knowledge was not a useful predictor of risk tolerance.

In similar fashion, Nathan et al. (1992) discovered that knowledge about an alleged source of risk did not differ significantly for respondents who were less risk tolerant and those who were more tolerant. Likewise, Sandman et al. (1987) discovered
that knowledge did not influence homeowners' degree of distress about indoor radon and willingness to take action to mitigate risk. The researchers found that information was reaching the public, but did not affect residents' decisions to monitor for radon gas, intention to take remedial action, degree of distress about the gas and evaluation of the seriousness of one's own radon level. These studies indicate that much is yet to be learned about the kinds of data people use and the reasoning they apply to assess risks and attribute their causes. These findings are drawn into sharp relief by the fact that the EPA requires chemical companies to supply technical data based on the following assumption: People can understand and make personal decisions if they have basic information about which chemicals are produced and stored in a community, whether a chemical is harmful in the opinion of some authority such as the EPA, and whether that chemical is released into the environment where it comes into contact with people and other living things.

Harms and Benefits

Harms and benefits are important aspects of the risk assessment equation. Krimsky (1992) observed that expected utility theory includes a set of decision rules that define rational behavior; people would follow these rules if they had enough time and information to consider the consequences of alternative options. People may infer that they receive benefits (or suffer harms) and then decide whether they suffer risks that are intolerable. Those who think they are harmed do not support the source of risk (Heath et al., 1995).

Although technical knowledge may have little effect on risk tolerance, other types of knowledge, especially perception of benefits, may be relevant to risk tolerance. For
instance, Baird (1986) found judged benefits of the hazard were ranked first among other variables in correlation with risk tolerance. Fischhoff et al. (1978) found a weak but consistent relationship between perceived benefit and acceptable risk level. Gardner and Gould (1989) found benefits played a significant role in the risk acceptability of only two of six risky technologies they tested (and not for industrial chemicals). People tolerate higher risks from activities seen as beneficial, if benefits extend beyond economic to include qualitative variables such as basic needs, safety, security, and pleasure.

Otway et al. (1978) found that economic and technical benefits contributed most to the pro-nuclear respondents' attitudes toward nuclear power. The environmental aspect of nuclear power was seen as positive by the "for" group but was evaluated negatively by the "against" group. Thomas et al. (1980) found policy makers were significantly more favorably inclined than the public toward the use of nuclear energy primarily because they did not link the technology with psychological risk.

Considering questions by citizens during environmental reviews of incinerators, Konheim (1988) argued for a risk-benefit analysis and not just a prediction of upper bound risks. Often-repeated questions at hearings include: What are the risks compared to the benefits of the project? How is the risk calculated? Does the design of the facility make the risk as low as possible? Who in the community bears the burden of the risk? What are the chances of a serious accident? Are the risks identifiable? Can the public influence how the facility is designed and operated? An ideal risk-benefit approach should evaluate alternative risks, examine catastrophic potential and assess ways that enable those affected to control the risk in meaningful ways.
Several recent studies have shown significant relationships between perceived economic benefit and support for hazardous industries (Heath et al., 1993; Nathan et al., 1992). Flynn, Burns, Mertz and Slovic (1992) suggested that the local community would support hazardous facilities as long as the benefits of the facility outweigh the possible risks. This study of the Yucca Mountain Repository measured economic benefits as the perceptions of positive economic benefits resulting from the citing of the nuclear waste repository. The respondents in the study were well aware of the new jobs and public revenues promised by this project. The hypothesis was that those who felt the repository would bring economic benefits to the area would be more inclined to support its citing. Surprisingly, no statistically significant relationship was found between perceived economic benefit and support for the site. On the other hand, Flynn et al. (1992) discovered that those respondents who felt the citing of the plant would stigmatize Nevada as a nuclear waste dumpsite and thus negatively affect the state's image to potential tourists were significantly opposed to the site. In a study of a plastics plant near two small Texas towns, Heath et al. (1993) found evidence to support Flynn et al.'s (1992) findings. Respondents' support for the local plant was found to correlate positively with the perceived economic benefits of the plant. Additionally, those who perceived economic harm from the facility were significantly more likely to oppose it.

Uncertainty

Aristotle (trans. 1932), in discussing enthymene, suggested that people do not have to deliberate upon which is certain: that no human action is inevitable. Rather, people have to deliberate upon what is uncertain and judgment probabilities. These
uncertainties, and judgments based on them, are necessary elements of all discourse concerning risk. The very nature of risk prohibits absolute definitions and knowledge.

Risks by definition are matters of uncertainty. In this vein, Albrecht (1988) defined uncertainty as the lack of attribution confidence about cause-effect patterns. Publics want to reduce their uncertainties about the subjects under consideration and about the people who are creating those uncertainties. Thus, uncertainty is a measure of confidence regarding the ability to estimate risk and its consequences and the ability to communicate knowledgeably on the facts and issues surrounding any specific risk.

Concerning communication related to complex chemical manufacturing issues, it is understandable that for community residents risk messages can be confusing; they come from a variety of sources that involve multiple parties and often reflect competing scientific conclusions. Experts and regulatory agencies often operate on the assumption that they and their audiences share a common framework for evaluating and interpreting risk information. This confusion also stems from the fact that prominent government officials take different and often opposing viewpoints about environmental, health, and safety risk matters and participate in highly public debates about risk estimations (Covello, 1992; Krimsky & Plough, 1988).

To complicate matters, uncertainty thrives in risk communication issues:

In turbulent times, uncertainty and distrust soar. Highly involved people struggle to control sources of risks that affect their self-interests. Information and knowledge become less relevant to the need to exert control because they are only loosely related to risk tolerance. (Heath, 1995, p. 273)

Otway (1992) suggested that when policy decisions regarding technological risks need to be made, that is the time when scientific knowledge is often the most uncertain. During crises or other troubling times, uncertainty is likely to increase. This concept is evident

Within risk perception and communication discussions, uncertainty also has been related to estimating risk information about technical risks (Covello, 1992; Fischhoff, 1985; R. Kaspersion, 1986; Wilson & Crouch, 1987), to assessing the impact of a new or unfamiliar technology (Bord & O’Connor, 1990; Lindell & Earle, 1983) and to calculating the degree in confidence to communicate knowledgeably about risk issues (Heath, Abel & Dougals, 1996; Nathan et al., 1992), to identify a few. Uncertainty motivates information-seeking because it is uncomfortable. Using that principle, uncertainty reduction theory explains the human incentive to seek information (C. Berger & Calabrase, 1975).

Driskill and Goldstein (1986) defined uncertainty "as the perceived lack of information, knowledge, beliefs and feeling necessary for accomplishing organizational tasks" (p. 41). Publics want information to reduce their uncertainties about the subjects under consideration and about the people who are creating those uncertainties. In facing the uncertainty of the future, people use the best information available to reduce their fears, to achieve a sense of control over the future, to feel better about what they have to do – face uncertainty with incomplete information. Even with complete information (if such a thing is possible), the uncertainty of the future cannot be controlled. "The anticipating emerging issues and, more generally, the study of the future can reduce, but not eliminate the perception of uncertainty" (Renfro, 1993, p. 7).

Overall, very little direct evidence exists concerning what determines uncertainty, especially as it relates to influence. According to McGarty, Turner, Oakes and Haslam
uncertainty is a judgmental confidence, in a way that someone believes that a specific cognition is correct or incorrect; thus, people should be more confident in a response to the extent to which they have evidence in favor of that response. Abel (1995) noted:

In a risk situation, uncertainty refers to the inability of a person to accurately estimate, in his or her own mind, the likelihood of an occurrence of a risk and the degree of its negative impact. However, there may also be an amount of uncertainty regarding one's knowledge of the issue pertinent to the risk or hazard. The possibility of uncertainty being a multidimensional variable is quite important because where risk is concerned, conflicting information is likely to abound. (p. 22)

Renn (1992a) supported this multidimensional approach to uncertainty, suggesting that the perceptions of probabilities in decision making affect people's ability to draw inferences from probabilistic information based on the difficulties in intuitive processing of uncertainty. Overall, "the intuitive understanding of risk is a multidimensional concept" (p. 66). McGarty et al. (1993) also suggested that uncertainty is a covariate (cause or effect) on the influence process. "It is precisely because uncertainty varies as a function of the influence process that there is very little clear evidence showing variations in it due to agreement and disagreement" (p. 20). Both Heath and Nathan (1991) and Driskill and Goldstein (1986) concluded that one of the goals of risk communication should be to engage in dialogue to reduce uncertainty, that the goal of communicators is to reduce and manage their own and their audiences' uncertainties through language.

Control

Control is a natural response to the uncertainty that characterizes risks. Many studies have demonstrated that control is a primary variable in risk communication (e.g.,
Covello & Johnson, 1987; Heath and Palenchar, 2000; Lindell & Earle, 1983; Sims & Bauman, 1983; S. Thompson, 1981). S. Thompson (1981) defined control as the belief that an individual or organization can influence an event, or at least has the ability to do so if it chooses to influence the aversive situation. Control can be exerted to reduce the likelihood of a risk event or to minimize its impact. Like uncertainty and other risk communication process variables, control is multifaceted. Lindell and Earle (1983) determined that residents' lack of control created public opposition to hazardous facilities. Johnson (1987), as did Hance, Chess and Sandman (1989), determined that risk communication is likely to fail if it does not increase residents' control in the decision-making process regarding the risk. A risk is more acceptable to persons if they have some degree of control over the situation (Covello, 1989; Fischhoff et al., 1978). At-risk groups are more willing to accept risks if they have some control over them (Covello et al., 1988; Lindell & Earle, 1983).

Covello (1992) argued that an individual's control is a key determinant of people accepting risk, and Bord and O'Connor (1990) found that people's perceptions of industry control affect their risk estimates related to chemical cleanups. Weterings and Van Eijndhoven (1989) and Sharlin (1986) found that economic controls affected risk tolerance levels. R. Kasperson (1986) discovered a relationship between people's belief that they can control the gathering of information and the support for risk communication programs.

These examinations of control feature the variable as a personal trait, a trait of those who feel they (internal) or others (external) are responsible for their own actions, situations, and future. Internal control occurs when persons feel some control over their
destinies. Personal control extends to perceptions of speed of onset, scope (area), and duration of impact of the risk, as well as the quality of emergency preparedness. External control results when outside forces are perceived to have control over a risk source. In this regard, Sims and Baumann (1983) found that the more a person feels in control (internally or externally) the less he/she should feel that local chemical plant activities will affect their life. Community-based control means that members of a community seek to exert corporate responsibility standards on organizations that generate risks and their watchdog counterparts (including government and non-profit organizations).

Based on these findings, it is reasonable to assume that people respond to the uncertainties of risk occurrence and outcome by attempting to increase personal or community control over the source of the risk. Risk communication processes and statements are more likely to be effective to the extent that they empower citizens of a community of risk. As people think about risks, they ask many questions: Will something happen? Will it be bad? Will I suffer from the damage? To compensate for feelings of uncertainty, people want to exert control; uncertainty is a motivator and control is a means for reducing uncertainty.

Trust

Trust is also a central risk communication process variable. People tend to be less afraid of risks that come from places, people, corporations, or other organizations that they trust and are more afraid if the risk comes from a source they do not trust (Ropeik & Gray, 2002). If expert risk estimates conflict with one another, the decision to be made becomes more complex and requires greater amounts of trust. For effective risk
communication, the source of information and advice needs to have a satisfactory level of trust in the judgment of each public (Renn & Levine, 1991).

Trust is a multidimensional construct that results from the amount of control an audience believes it can exert over sources of risk information and assessment. As R. Kasperson concluded, "There is not a single risk communication problem; there is not a single social trust problem. There are many problems, and they are different" (In Davies et al., 1987, p. 45). Trust is affected by vulnerability, predictability, and reward dependability.

Trust predicts what people believe and the sources on which they rely. The infrastructure exhibits social amplification as various players receive, comment on, and pass along information and opinions. Making this point, R. Kasperson (1992) concluded: The concept of social amplification of risk is based on the thesis that events pertaining to hazards interact with psychological, social, institutional, and cultural processes in ways that can heighten or attenuate perceptions of risk and shape risk behavior. Behavioral responses, in turn, generate secondary social or economic consequences. These consequences extend far beyond direct harms to human health or the environment to include significant indirect impact such as liability, insurance costs, loss of confidence in institutions, stigmatization, or alienation from community affairs (pp. 157-158).

In this communication infrastructure, interpersonal communication is instrumental in place of or in support of mass-mediated communication. Through media reports and interpersonal contact, people seek confirmation for their conclusions about risks. Information seeking is predisposed to confirm assumptions and goals of the persons involved. This infrastructure is a dialogue – many people discussing issues and sharing
information through media and interpersonal channels. People rely on experts as well as acquaintances. The flow of information and opinion is complex and multidirectional, rather than linear from an expert source to lay publics. Residents may trust the process of dialogue more than the content of the process.

Trust is a vital part of this narrative. People in each community where risks occur must be able to trust the efforts to achieve reasonable levels of security. Such levels need to withstand the “smell” test of the area residents that they could and should trust industry to exert reasonable amounts of security and communicate in ways that increase rather than decrease citizens’ security.

Trust is a counterpart of control. It assumes that when people are vulnerable in one way or another to one another the matter of trust becomes relevant. Industry would like to say, “Trust us because we have planned and put policies into place that will reasonably protect your interests, your security and safety.” Trust is also a central factor in predicting whether members of a community accept and rely on the conclusions and recommendations of people who are trained in science, national security, business operations, engineering, emergency management and public policy. Risk assessments require scientific and decision-making techniques that are often foreign to community residents. If expert risk estimates conflict with one another, the decision to be made becomes more complex and requires greater amounts of trust. For effective risk communication, the source of information and advice needs to have a satisfactory level of trust in the judgment of each public (Renn & Levine, 1991).

Trust is demonstrated in word and deed. It is groomed and maintained. It can be lost or destroyed. Thus, it is an integral ingredient in risk communication. These factors
influence how, what, when, and to whom the industry will communicate. In essence, when it comes to risk communication related to chemical manufacturing, storage and transportation, variables such as knowledge, harms and benefits, uncertainty, control and trust remain key elements of stakeholders’ narratives that can provide insight into both risk management and risk communication protocols.

Social Construction of Reality

People do not form their identities because they set themselves apart from others in society. Individuals become selves as they realize themselves in relation with others and through interaction with others. In essence, the social quality of humanity is everything that people do with each other and what people – individuals, groups, communities and cultures – become as we do it, continually influenced and ever changed by the socialness that is inherent in the creation of self. “We individuate by identifying ourselves on a social landscape, a landscape we come to know as we interact with it. We discover and create ourselves and others by what we do with each other” (Bazerman, 1993, p. iix)

Social, thus, is the stage on which individuals enact themselves and their relationships with others. This social stage, however, is eclectic and infinite. It contains laws, ideas, history, culture, gender, knowledge, awareness, and discretion. It incorporates public, social, religious and economic policies. It includes character, ethics, morals, and organizational responsibilities. It involves individuals, small and large groups, private and public organizations, and small private businesses and industries. It wraps around hard, social, and human sciences.
Within this vast, complex landscape of social lies symbolic, transactional communication that socially constructs awareness, attitudes, knowledge, values and behaviors – all elements of perception and ultimately constructed realities. It is through a community’s oral and written words that much of this interactive human landscape is created, through words and symbolic representation. As Bazerman (1993) summarized, “We become ourselves by using the common symbols for our own ends, but these ends we often discover as we interact with others” (p. iix).

Following the lead of philosophers and historians like Nietzsche, Dewey, Heidegger, Wittgenstein, Scheler and Kuhn, social construction theorists generally accept the claim that knowledge is socially determined and constructed. The social construction of reality theory contends that reality is socially constructed and that the sociology of knowledge must scrutinize the manner in which this occurs (P. Berger & Luckmann, 1967). From this orientation, P. Berger and Luckmann described reality as “a quality appertaining to phenomena that we recognized as having a being independent of our own volition” and knowledge as “the certainty that phenomena are real and that they possess specific characteristics” (p. 1). In essence, people conceive their own distinctive social reality through contact and interaction with others (P. Berger & Luckmann, 1967; Watzlawick, Beavin & Jackson, 1967).

P. Berger and Luckmann (1967) contend that the sociology of knowledge must concern itself with whatever passes for knowledge in a society, created by individuals and groups within that society, regardless of the ultimate validity or invalidity of such knowledge (regardless of the criteria used to evaluate such knowledge). This human knowledge, or perception, is identified, developed, rationalized, maintained, and altered
in social situations. As if almost directly speaking to risk communication scholars, they argued that “the sociology of knowledge must seek to understand the processes by which this is done in such a way that a taken-for-granted ‘reality’ congeals for the man in the street” (p. 3). Building specifically on the work of Alfred Schutz, P. Berger and Luckmann (1967) argued that the reasonableness of knowledge in everyday life presents itself as a reality interpreted by individuals and subjectively meaningful to them as a rational and coherent perspective:

The world of everyday life is not only taken for granted as reality by the ordinary members of society in the subjectively meaningful conduct of their lives. It is a world that originates in their thoughts and actions, and is maintained as real by these… the objectivations of subjective processes (and meanings) by which the intersubjective commonsense world is constructed. (pp. 19-20)

The authors argue that our reality is constructed and maintained through language (see, e.g., pp. 58-62, 92-104).

Language and actions serve this principle sustaining function, but it is language, via symbols, through everyday speech that is the principle method (P. Berger & Kellner, 1964):

As the latter [speech] occurs, it validates over and over again the fundamental definitions of reality once entered into, not of course, so much by explicit articulation, but precisely by taking the definitions silently for granted and conversing about all conceivable matters on this taken-for-granted basis. (p. 220)

Speech allows the individual to adjust to changing, conflicting, and other new social contexts within his perspective. As P. Berger and Kellner pointed out, “One converses one’s way through life” (p. 221).

One of the strongest emphases of socially constructed and other social perspective orientations is the fundamental rejection of positivism. According to positivist language theorists, knowledge is a direct apprehension of reality, where an individual’s mind acts
as a mirror reflecting the outside world of existence, and ideas are considered true as much as they reflect what is seen or heard and ultimately confirmed by the outside world. Social theorists reject that notion (e.g. P. Burger & Luckmann, 1967; Burke, 1966; Fisher, 1985b; Thralls & Blyler, 1993). For example, political scientist Edelman (1988) described how politics is socially constructed through language:

It is the language about political events, not the events in any other sense, that people experience; even developments that are close by take their meaning from the language that depicts them. So political language is political reality; there is no other so far as the meaning of events to actors and spectators are concerned. (p. 104)

A large amount of risk communication research also comes from the traditional theoretical position known as objectivism. This perspective operates on the assumption that awareness, knowledge, attitudes, information, knowledge, behavioral intentions, and behaviors are a given in nature, essentially uncontaminated by social factors. The social construction of reality theory argues against a purely objectivist or positivist sense of perceptions. Knowledge is not something that only exists in our heads and is learned from informative communication, but is rather “the production of discourse... through social interaction, because discourse can be recognized as discourse only after it becomes part and parcel of the normative conventions that form the social communities in which we all must live and work” (Kent, 1993, p. 79).

For risk communication scholars and practitioners, the social construction of reality theory raises questions about whether the differences between key stakeholders’ realities may not be understood in relation to various differences between individuals and/or publics. Though not directly naming risk communication or public relations, Seibold and Spitzberg (1982) argued that communication cannot be considered and
realized without an appreciation for the interpretations communicators bring to symbolic discourse:

> Without attention to the ways in which actors represent and make sense of the phenomenal world, construe event associations, assess and process the actions of others, and interpret personal choices in order to initiate appropriate symbolic activity, the study of human communication is limited to mechanistic analysis. (p. 87)

Language is the means by which people function on two levels: their individual thoughts and the realization that others have similar meanings and interpretations (Heath & Bryant, 1992). By concentrating on language and the subsequent symbolic meaning, risk communication research can provide insight on relationships between words and issues, and between content and meaning, as well as by examining how interaction transpires regarding risk perceptions.

Risk communication scholars examine the social construction of reality through the scrutiny of symbols and meaning within the substance of messages constructed and shared by organizations with key stakeholders. It is through these messages — symbols — that people create, manage and share interpretations of reality through social interaction, allowing society to function by the sharing and giving of meaning to physical and social realities (Burke, 1966). Ultimately, this sharing provides a footing for cooperative behavior through social reality, the understanding each person has of what other people know (P. Berger & Luckmannn, 1967). The overall symbolic constructionist process here that is of particular interest to this study is the one that constructs, maintains, and alters a consistent reality that can be meaningfully experienced by the individual and community. As P. Berger & Kellner (1964) noted, everyday society has its way of defining, describing and perceiving reality, and it is through its overarching organization
of symbols that a system of ready-made typifications provide a framework in which the innumerable experiences of reality come to be ordered.

Though not the only influencing factor, an individual’s construction of reality clearly is related to the society or community in which the individual exists; in each community there exists an overall consensus on the range of differences deemed to be tolerable (P. Berger & Kellner, 1964):

This order, by which the individual comes to perceive and define his world, is thus not chosen by him, except perhaps for very small modifications. Rather, it is discovered by him as an external datum, a ready-made world that simply is there for him to go ahead and live in, though he modifies it continually in the process of living in it. Nevertheless, this world is in need of validation, perhaps precisely because of an everpresent glimmer of suspicion as to its social manufacture and relativity. This validation, while it must be undertaken by the individual himself, requires ongoing interaction with others who co-inhabit this same socially constructed world. In a broad sense, all the other co-inhabitants of this world serve a validating function. (p. 220)

Social Risk Perspectives

Social perspectives on risk managemenet and risk communication are gaining ground in a field that has been historically dominated by actuarial, economic, and psychological approaches. Dietz, Fray and Rosa (1993) may have summed up the commonality among social perspectives on risk. “Humans do not perceive the world with pristine eyes, but through the perceptual lenses filtered by social and cultural meanings transmitted via primary influences such as the family, friends, subordinates, and fellow workers” (p. 39).

For example, studies of risk, equity, and fairness (including environmental racism and risk distribution among classes and populations) have become a hot topic and important area of research (R. Kasperson & J. Kasperson, 1983). Reflecting this growing trend, Bord and O’Conner’s (1997) demonstrated gender differences toward perceived
risks and the concern that women face an unequal burden of environmental risks, while Boer, Pastor, Sadd and Snyder's (1997) demonstrated that hazardous waste sites are more likely to be located in working-class communities of color near urban areas. Other social perspective of risk studies have focused on the sociology of disasters (e.g., see Dynes, De Marchi and Pelanda, 1987), organizational aspects of risk (e.g., Clarke, 1989; Perrow, 1984), analysis of media coverage (e.g., Lichtenburg and MacLean, 1988), risk conflicts and their causes (e.g., von Winterfeldt & Edwards, 1984; Deitz, Stern & Rycroft, 1989) and epistemology or legitimation of risk knowledge (e.g., Dietz & Rycroft, 1987; Jasanoff, 1986).

Within organizational studies, for example, Neilson and Rao (1987) viewed organizational legitimacy as a complex process of a social constructed reality, based on localized social norms and values. In the science/health communication field, numerous researchers have examined media coverage of scientific findings as partially socially constructed (e.g., Friedman, Dunwoody & Rogers, 1999). Many researchers in the field of sociology of ignorance argue that scientists' claims regarding knowledge are either inherently social or at least partially subject to social processes (e.g., Proctor, 1995).

On a theoretical level, several social theories related to risk have been developed during the past 20 years. Theories developed from this perspective include social cognition theory, social exchange theory, social identity theory, social judgment-involvement theory, social learning-social cognitive theory, social penetration theory, and the broader category of social theories of media effects (Heath & Bryant, 1992). A review of the literature found some common areas of studies, but as Renn (1992a) noted,
“Any attempt to classify these studies and link them to underlying theoretical concepts is like trying to find order in chaos” (p. 67).

Three major social theories of risk, however, have direct implications for this study. These include the social amplification of risk theory, social arena concept, and social drama theory. R. Kasperson’s (1992) social amplification of risk theory is based on the condition that hazardous and other risk events interact with psychological, social, institutional, and cultural processes in a manner that can either increase or decrease perceptions of risk and resulting behaviors towards those perceptions. “The experience of risk is therefore both an experience of physical harm and the result of culture and social processes by which individuals or groups acquire or create interpretations of hazards” (p. 159). Within this theory, individuals act as members of groups (cultural) and social units (neighborhoods) that codetermine the dynamics and social processing of risk. These larger social units, according to R. Kasperson, are termed social stations of amplification. R. Kaspersion built this term on the idea that individuals in their roles as members or employees of social groups or institutions do not only follow their personal values and interpretive patterns; they also perceive risk information and construct the risk problem according to cultural biases and the rules of their organization or group (Johnson & Covello, 1987).

The second social risk theory is social arena concept. Advocated by Renn (1992b), the basic idea is that social groups in political arenas:

[T]ry to maximize their opportunity to influence the outcome of the collective decision process by mobilizing social resources.... The outcome of this struggle, however, is determined not only by individual or group actions, but also by the structural arena rules and the interaction effects among the competing groups. (pp. 180-181)
The term “social arena” is used to describe the social and political location of competing interests. This theory focuses on explaining the process of policy formulation and enforcement in a specific, risk policy field. Power is a strong variable in the equation, though power is appreciated by all areas of the social arena, including stakeholders, stakseseekers, political institutions, the public, and issue amplifiers.

Third, and most applicable to this study of risk from both a social and narrative perspective, is the social drama theory of risk. Palmlund (1992), building on the works of social philosophers and scholars such as Aristotle, Kenneth Burke, Mary Douglas, and Aaron Wildavsky, developed his social perspective of risk based on two primary concerns with the direction of other risk studies: that risks to human health and environment can be defined by quantitative estimates and priced as commodities, and that risk communication is being used to manage opinions solely for the purpose of advancing dominant modes of technology development. He argued that risk should be approached from a perspective that emphasizes the role of social interaction, emotion, and power in public life; the desire of humans to exert control over the unknown and uncontrolled. “In this interaction it is possible to discern patterns that are continually created and re-created through emotional and intellectual experience” (p. 199).

Palmlund (1992) saw social evaluations of risk as a contest, with competing views of reality among the participants. These participants (e.g., community residents, industry, government regulatory agencies, school systems, scholars) compete to define what should be seen as the benefits and liabilities of risk, some of whom have complementary interests while others have conflicting interests. For example, his analysis has led to identification of blaming games and stories of celebration – participants act to “convince
an audience” (p. 199). He described this acting out of a social process as social
dramaturgy.

Palmlund's (1992) analysis features characters typical of sociopolitical drama,
centering on audience agents and roles. Audience is the public or key publics whose
support each character seeks. Without an audience, you have no drama: “No decision on
acceptable risk would be taken” (p. 201). Characters are audiences to one another. There
have been a limited number of studies in relation to audiences beyond formal
organizations (e.g., corporations, governmental agencies). Bourdieu (1984) argued that
within the discourse of risk, a lot of the social action reflects a celebration of technology,
where a critique about the actual need for the technology or product would be an act of
self-destruction. As Goffman (1959) noted almost a half-century ago, within certain
settings [risk], open conflicts regarding the definition of situations are avoided.

Actors are considered agents or “persons acting to promote certain interests”
(Palmlund, 1992, p. 202). Actors take different roles depending on their position or
stance on issues. From this perspective, building on Goffman’s (1959) work among
others (e.g., Bourdieu, 1999), people are viewed not as individuals but as personae, as
human beings with masks that vary according to the context. These personae, and the
resulting behaviors, are influenced by the standards of the groups to which people belong
(Frank, 1957). As such, social construction and search for consensus and approval have a
great influence on human perceptions, including those perceptions of risk (Palmlund,
1992). As M. Douglas (1985) identified in her work, social concerns influence our
selective perception of risk.
The major risk roles identified by Palmlund (1992) include risk bearers, risk bearers' advocates, risk generators, risk researchers, risk arbiters, and risk informers. Risk bearers think of themselves as victims; they may or may not actually be victims of negative consequences of a risk. Risk bearers' advocates are heroic protagonists who speak on behalf of risk bearers. Risk generators create risks, or are perceived to do so; they are antagonists in risk narratives. Risk researchers apply science to determine whether risks occur and if so how they can be abated or mitigated. Risk arbiters take actions to save risk bearers. Risk informers, such as reporters and advocacy groups, comment on the actions, risks, policies and outcomes.

Another aspect of social drama theory relates to the dramatic process, or the representation of the risk conflicts and discourse. Part of this process is dramatic action of risk. Risk is, according to Palmlund (1992):

> [A] code word that alerts society that a change in the social order is being requested... Conflicts over risk are processes played out over time, where anxiety is contrasted with security, and where perceptions of chaos and risk are intermingled with perceptions of order and certainty. (p. 206)

A breach in regular patterns – risk – can be triggered by a sudden hazard or accident, when scientific findings reveal threats, or when slowly over a period of time evidence compiles that lends an individual or group to take action and put the risk in the political age.

**Narrative Theory and Rhetorical Enactment**

This section explains and draws on narrative theory to help explain how risk communication and other public relations professionals responsible for predicting and responding to risk management issues and community risk perceptions can approach such situations as though they were narratives. Knowing the common narratives of a group,
community or society allows risk communicators the framework for scanning, analyzing, identifying, and monitoring community residents’ perceptions related to living near chemical manufacturing, storage and transportation facilities.

Narrative theory is an important element of human communication analysis, not simply in the languages, drama and literature fields, but throughout various disciplines of human sciences, ranging from anthropology to linguistics to sociology. Historically, and still held true today, is that narrative functions represent “a universal medium of human consciousness” (Lucaites & Condit, 1985). White (1981) described narrative as a “metacode” that allows for transactional transmission of “messages about shared reality” (p. 2).

Narrative theory, devised by Fisher (1984, 1985a, 1985b, 1987, 1989), adds depth to the view that people enact their lives as actors in an undirected play (Pearce & Cronen, 1980; see also Cronen, Pearce, & Harris, 1982). What is a narrative? According to Foss (1996):

A narrative generally is recognized to be a way of ordering and presenting a view of the world through a description of a situation involving characters, actions, and settings.... A narrative, as a frame upon experience, functions as an argument to view and understand the world in a particular way, and by analyzing that narrative, the critic can understand the argument being made and the likelihood that it will be successful in gaining adherence for the perspective it presents. (p. 400)

Narratives are a way of thinking, a way of ordering the events of the world that would otherwise seem unpredictable or incoherent. Through narratives, people structure their experiences and actions. Narratives give meaning to the world. Through stories, the world and people's actions reflect a logic that explains what happens, why it happens, who makes it happen, when it happens, and how people should respond to these events.
Narratives express a set of preferences, the values of the persons who ascribe to those narratives. Scripted logics allow people to create and share a variety of social realities. Stressing this point, Gergen and Gergen (1988) concluded:

Narratives are, in effect, social constructions, undergoing continuous alteration as interaction progresses. The individual in this case does not consult an internal narrative for information. Rather, the self-narrative is a linguistic implement constructed by people in relationships and employed in relationships to sustain, enhance or impede various actions. It may be used to indicate future actions but it is not in itself the basis for such action. In this sense, self-narratives function much as histories within society do more generally. They are symbolic systems used for such social purposes as justification, criticism, and social solidification.

(Narratives have substantial rhetorical potency because they are a conventional and convenient means for understanding the theme that runs throughout a series of events – including health, safety, and environmental manufacturing incidents. Fisher (1985b) noted that the primary purpose of rhetorical narrative is to advocate something beyond itself. Fisher (1985b) summed up the strength of focusing on narrative from a rhetorical perspective, demonstrating the value for exploring narrative in the evolution of social and political consequences:

[A] rhetorical narrative is a story that serves as an interpretive lens through which the audience is asked to view and understand the verisimilitude of the propositions and proofs before it. Both content and form of the rhetorical narrative are thus subservient to the demands of the relationship between the specific audiences to which it is addressed, the specific context in which it appears, and the specific gain toward which it strives. (p. 94)

Two important forms with narrative, in relation to understanding social consequences of particular narrative forms and functions, are unity of direction and unity of purpose. Rhetorical contexts inherently include oppositionality – advocates taking one side or another in dispute – point and counterpoint. Since the rhetorical function of narrative advocates a particular understanding of the facts to a particular point of view, it
must be voiced and couched in terms of unity and single-purposefulness. Quintilian (trans. 1966) noted, “For we must state our facts like advocates, not witnesses” (p. 109).

For unity or purpose, it relates to the act-centered nature of rhetorical narrative:

Rhetoric is a discourse genre that exists for the purpose of wielding power by enacting the interest of a speaker in a specific, real world context... the successful completion of a rhetorical enactment requires more than a simple, textual construction. Rather, it must encourage, and indeed enlist, the audience’s active participation in the solution. (Fisher, 1985b, p. 100)

Fisher (1985b) argued that the unities of direction and purpose combine to form discourse dependency. In this sense, rhetorical narrative is not complete and self-sufficient textually. The claim supported by rhetorical narrative must be articulated outside of the narration as part of a whole and changing world:

Because the speaker in a rhetorical situation always seeks material gain in some measure, he or she is literally invested in the outcome of the rhetorical process and is therefore expected by an audience to assert and accept responsibility for the power and veracity of the narratives that are featured in discourse. (p. 100)

This view essentially supports Aristotle’s (trans. 1932) contention that investigation of public discourse cannot be separated from the role of discourse in society.

A social symbolic interactionist perspective for the study and practice of risk communication and public relations entails the analysis of words and other symbols via narratives. Specifically, words have propositional value (Burke, 1966), and the selection of those terms affects how information is considered, accepted, acted upon, or altered. These propositions, according to Heath (2001), compete “in ways that help to inform judgments and actions, clarify and order the evaluative (value) dimensions of thought and choice, and justify or deny the expedient wisdom of competing policies” (p. 32).

Meaning defines the identities and prerogatives of organizations, people associated with them, and their relationships (Heath, 1993, p. 142). Heath derived that
perspective from an examination of Burke's (1966) proposition that meaning is created and expressed through "terministic screens" with which people filter and form interpretations of reality and prescribe corresponding behaviors. Once these terministic screens, or interpretive patterns of perceiving and talking about reality, become observable through actions and discussions, Heath (1993) reasoned, they have become zones of meaning.

Thus, any observations made by publics, such as community residents, "are but implications of the particular terminology in terms of which the observations are made" (Burke, 1966, p. 46). Burke summized that "each of us shares with all other members of our kind... the fatal fact, that, however the situation came to be, all members of our species conceive of reality somewhat roundabout, through various media of symbolism" (p. 52). Each idiom reflected in the language and meaning of the risk community, according to Heath (1993), is a unique view of economic, political, social, corporate, personal and community interests.

Risk communication helps organizations enact and co-manage risk, stressing the roles of social interaction, power, and emotions in public life (Palmlund, 1992). "Societal evaluation of risk must be seen as a contest, where the participants offer competing views of reality. They compete to define what should be viewed as the benefits and the risks of prevailing production practices" (p. 199). Thus, risk perceptions can be considered a drama enacted by many personae, each attempting to create and live a different view of reality.

Social meaning constructed through language and experiences in these dramas are created in increments, one statement at a time. According to Burke (1966), Fisher (1987),
and Heath (1993), these statements become an encompassing statement expressing preferred perspectives. Thus, socially constructed meaning is self-reflexive as well as externally directed. People persuade themselves while they are attempting to persuade others at the same time. They create in a sense, which zones of meaning are best for themselves, for whatever reasons their zones of meaning construct and accept.

This contest is dialectic of issue positions and interests. Narrative is an appropriate means for assessing this clash because it is dialectic – characters who advance various plots and themes set positions against one another. To better understand a community or public, one can deconstruct its narratives. Risk assessment and planning that does not consider the dialectic dynamics – communication and opinion formation – of each community is likely to lead to frustrating outcomes for the person making the risk assessment and for the residents of the community. Data should also be judged according to premises that arise through community dialogue.

Understanding the narratives within zones of meaning held by key publics is therefore an integral part of risk communication and public relations studies. If zones of meaning – facts, value premises, and conclusions – in communities differ, then risk responses must be tailored to each public to achieve agreement. Combining the analysis of Heath, Fisher and Palmlund, researchers can look for specific roles and their perceptions that are located in a risk scene. Out of such a struggle emerge the culture of a story and a sense of the relationships that are at work. Deconstructing risk narratives ultimately can help public relations practitioners understand how key stakeholders navigate through the information environment by better understanding what sources of information and how narrative elements frame their perception of risk.
Culture

Culture shapes people's thoughts and actions. It accounts for how groups view and evaluate their physical and social worlds, so wrote Sapir (quoted by Whorf, 1956, p. 134). The culture of each entity (business, government, and citizen) influences its decision-making processes and expectations relevant to the formation of corporate, societal, and governmental policy. Cultures of organized publics are likely to attract supporters, including non-activist community members, detractors, and latent publics.

What is culture? G. Morgan (1997) viewed it as "a process of reality construction that allows people to see and understand particular events, actions, objects, utterances, or situations in distinctive ways" (p. 138). Culture is, he believed, "shared values, shared beliefs, shared meaning, shared understanding, and shared sense making" (p. 138). Culture is a set of unique opinions, a way groups think about themselves – their identity and actions – and view the world around them. Schein (1985) argued that culture "is a pattern of basic assumptions – invented, discovered or developed by a given group as it learns to cope with its problems of external adaptation and internal integration – that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think and feel in relation to those problems" (p. 9). Cultures are contained in its artifacts – stories, legends, myths and physical attributes of an organization. These artifacts are vital to understanding the politics and power that operate in an organization (Mumby, 1987).

M. Douglas (1992) saw culture as serving at least two major functions: fostering accountability and shaping knowledge. Cultural theory starts by assuming that a culture is a system of persons holding one another mutually accountable. A person tries to live at
some level of being held accountable which is bearable and which matches the level at which that person wants to hold others accountable. From this angle, culture is fraught with the political implications of mutual accountability.

Through culture, people express standards they expect others to meet. For instance, a culture defines theft as offensive. In similar fashion, industries that harm the health and safety of citizens can violate cultural expectations. Addressing the connection between culture and knowledge, M. Douglas (1992) concluded: "Each type of culture is based on a distinctive attitude toward knowledge" (p. 32). Culture influences the facts that people hold as knowledge. Thus, one culture may conclude that a particular risk is tolerable, whereas a conflicting culture might draw the opposite conclusion. Culture is evaluative, an expression of shared expectations and knowledge.

Culture is connected to risk perception. Making that point, M. Douglas (1992) offered cultural theory as "a way of thinking about culture that draws the social environment systematically into the picture of individual choices. It provides a method of analyzing public debates as positions taken in a conflict between cultures" (p. xi). The subtleties of a culture are an important part of building relationships and communication practitioners must understand and appreciate cultural differences and be responsive to them (Newsom, Turk & Kruckeberg, 2001).

The study and practice of risk communication can productively center on the role that culture plays in how organizations meet or violate the expectations of key publics. Risk communication is more effective when it considers publics as representing multiple cultures that define which risks are tolerable. Supporting this view, Rayner (1992)
concluded, "Cultural theory argues that risks are defined, perceived, and managed according to principles that inhere in particular forms of social organization" (p. 84).

Key publics can have different cultural perceptions of risk that can lead to conflict. "Cultural analysis of risk looks behind the perception of physical risks to the social norms or policies that are being attacked or defended" (Rayner, 1992, p. 91). M. Douglas (1992) also saw a culture clash in society regarding standards of risk assessment. "Risk analysis that tries to exclude moral ideas and politics from its calculations is putting professional integrity before sense" (p. 44).

Risk perceptions are affected by decision heuristics that reflect the cultures of key groups, based largely on their roles in society. These roles in society, constructed through narratives of risk, are culturally driven. In this vein, risk communication can be viewed as the understanding of different publics' cultures, addressing the concerns of a variety of stakeholders' cultures, and working with the influence of culture on relationships. The culture of each group influences how it and society evaluates business activities and governmental policies. Evaluations may conflict with or support the preferences of an organization's policies and actions. Cultures of each enterprise and any public may collide. With strategic risk communication, organizations can reduce cultural strains and thereby work to build positive, beneficial relationships with key publics. Such analysis supports the view that risk culture is enacted in narrative form (Heath, 1992; 1994).

Community Right to Know

The community-right-to-know provisions help increase the public's knowledge and access to information on chemicals at individual facilities, their uses and releases into
the environment. Ideally, states and communities, working with facilities, can use the information to improve chemical safety and protect public health and the environment.

In the scope and purpose of community-right-to-know legislation, people are supposed to be alerted to the potentiality of a risk occurring that could affect their health or safety. So, on one hand, responsible community relations and employee relations calls for effective, continual and honest communication about risks and the best way of responding to prevent or mitigate the risk.

Citizen participation in environmental regulation is a relatively new development, though since the mid 1970s it has been viewed as a standard feature of public policy (Szasz, 1994). The growing sophistication of the environmental movement led federal and state agencies to devise more public policy that involved public participation and was one of the bases for community-right-to-know legislation.

The legacy of today's philosophy of community-right-to-know began to change dramatically in the mid-1980s. Following Union Carbide India Limited's toxic methyl isocyanate (MIC) gas spill (40 tons) in Bhopal, India, which killed more than 3,000 nearby community residents and plant workers and injured hundreds of thousands (the exact death toll remains under debate, with some estimates reaching into tens of thousands of deaths considering long-term health consequences,) the U.S. federal government became deeply involved in chemical related risk assessment, mitigation and communication processes. This involvement was also spurred by another Union Carbide facility in Institute, West Virginia, where more than 100 residents were hospitalized after being exposed to fumes from the pesticide manufacturing operations. By 1986, 30 states or cities had some form of community-right-to-know pollution requirements (Hearne,
The Bhopal tragedy, along with other energy-related crises such as Chernobyl, Love Canal, Three Mile Island, and Exxon Valdez, motivated citizens to worry whether similar risks loomed near their homes or at their work locations.

Prior to these iconic events, a generally unconcerned public and injudicious regulatory climate were the norm. For example, prior to the Three Mile Island accident, a few local residents who opposed the licensing hearings for the nuclear reactors at Three Mile Island were not allowed to raise questions or discuss issues related to nearby resident evacuation in case of an emergency because risk assessors and hearings officials had determined a serious accident as virtually impossible (Walsh, 1987):

The partial meltdown of Unit 2 in 1979, however, undermined the credibility of the organizations responsible for such probability estimates while also serving as a major catalyst in transforming a previously docile and trusting population into antinuclear activists. (p. 85)

Activists of all sorts sought to compel changes on industry. The type of events awakened a complacent public and fueled the arguments of many community activists.

Immediately after the Union Carbide tragedy in Bhopal, India, Rosenblatt (1984) observed, "If the world felt especially close to Bhopal last week, it may be because the world is Bhopal, a place where the occupational hazard is modern life" (p. 20). The historical realities of risk management as the essence of society became front-page and top-of-the-hour news hooks.

Worries that what happened in India could happen in many communities in the United States prompted federal legislators to create the Emergency Planning and Community-Right-to-Know Act of 1986 (EPCRA), section three of The Superfund Amendments and Reauthorization Act of 1986 (SARA Title III; SARA, 1995). For risk communication, the key part of SARA is the EPCRA, which gives the EPA oversight of
risk communication efforts related to the formation of LEPC. In addition, the Pollution
Prevention Act of 1990, the Chemical Accident Prevention Act, the Clean Air Act
Amendments of 1990, and the Chemical Safety Information, Site Security and Fuels
Regulatory Relief Act guide risk communication efforts. SARA also mandated each
state's governor to appoint members to a State Emergency Response Commission
(SERC), which in turn created LEPCs. Each SERC is responsible for implementing
EPCRA provisions within each state, including the 3,500 local emergency planning
districts and appointed LEPCs for each district. SERCs supervise and coordinate LEPC
activities, establish procedures for receiving and processing public requests for
information collected under EPCRA, and review local emergency response plans.

Codifying environmental risk communication, SARA and other federal policies
require chemical companies to inform citizens regarding the kinds and quantities of
chemicals that are manufactured, stored, transported and emitted in each community.
SARA's underpinning assumption is that as companies report the toxicity about the
materials they produce, transport and store people could become more informed of the
level of risk in their neighborhood.

Among other outcomes, this federal initiative was intended to increase the flow of
various kinds of technical information from experts to community residents and to open
channels of commentary between them. It is also likely that some of the motive for the
legislation was to pressure the industry to adopt and implement even higher standards of
community and employee safety. The EPA (1988) characterized this initiative in noble
terms:

The EPCRA creates a new relationship among government at all levels, business
and community leaders, environmental and other public-interest organizations,
and individual citizens. For the first time, the law makes citizens full partners in preparing for emergencies and managing chemical risks. (p. 3)

Defined this way, risk communication is successful to the extent that people who fear that they are harmed become more understanding and confident that sufficient control is imposed by the sources of the risk and by government.

Such is the case because this body of legislation and regulation had substantial political motivation. It was aimed to force a standard of operating excellence on an industry thought by its critics to be indifferent to the interests of employees and people who live in the shadows of such industrial operations. Critics advocated for the interests of people who might meet catastrophe through manufacturing explosions, derailed trains, exploding pipelines, and over turned trucks hauling explosive and otherwise hazardous materials. Reviewing the community-right-to-know provision for the Public Relations Society of America, Newman (1988) concluded, "The theory behind these toxic laws is that this information will not only help answer citizen questions about [chemical] releases, but will also assist them in pressuring government and industry to correct practices that threaten their health and environment" (p. 8). Understanding the nature and impact of a source of risk is not the only factor involved in risk assessment, management, and communication.

Specifically, Local Emergency Planning Committees (LEPC) were designed to plan for manufacturing emergencies, but they were also designed to serve as community forums where nearby residents, government officials, industry representatives, health and safety officials, and any other concerned individuals and organizations could request information and voice concerns. LEPCs typically meet once a month and are comprised of individuals from local government, industry, the medical community, school district,
and local residents. LEPCs are financially supported through the local industry and the hosting city. Each LEPC typically has several subcommittees that are responsible for establishing and maintaining risk management and risk communication protocols related to chemical manufacturing. These committees can include but are not limited to communications, community awareness, emergency response, finance, and transportation.

The LEPC membership must include, at a minimum, local officials including police, fire, civil defense, public health, transportation, and environmental professionals, as well as representatives of facilities subject to the emergency planning requirements, community groups, and the media. The LEPCs must develop an emergency response plan, review it at least annually, and provide information about chemicals in the community to citizens. Required elements of a community emergency response plan include:

a) Identify facilities and transportation routes of extremely hazardous substances;
b) Describe emergency response procedures, on and off site;
c) Designate a community coordinator and facility coordinator(s) to implement the plan;
d) Outline emergency notification procedures;
e) Describe how to determine the probable affected area and population by releases;
f) Describe local emergency equipment and facilities and the persons responsible for them;
g) Outline evacuation plans;
h) Provide a training program for emergency responders (including schedules); and,
i) Provide methods and schedules for exercising emergency response plans.

EPCRA, and thus community LEPCs, has four major provisions: emergency planning (Section 301-303), emergency release notification (Section 304), hazardous chemical storage reporting requirements (Sections 311-312) and the Toxic Release Inventory (TRI). EPCRA, Section 313, requires a publicly available, EPA database that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. Facilities are required to report their environmental releases and waste management practices annually to the EPA. Covered facilities must disclose their releases of approximately 650 toxic chemicals by roughly 23,000 factories to air, water, and land, as well as the quantities of chemicals they recycle, treat, burn, or otherwise dispose of on-site and off-site. These chemicals range from acetone to vinclozolin. While TRI is the most comprehensive national source of information about toxic chemical releases, it has critical limitations (Environmental Defense Fund, 2003):

a) Does not cover all toxic chemicals that have the potential to adversely affect human health or the environment;

b) Does not require reporting from many major sources of pollution releases;

c) Does not require companies to report the quantities of toxic chemicals used or the amounts that remain in products; and

d) Does not provide information about the exposures people may experience as a consequence of chemical use.

The EPA (SARA, 1995) has argued that it is one of the most successful environmental laws in the United States. Critics, however, have argued that the TRI is simply a pollution accounting system and makes no attempt other than through the power of information to control how pollution is managed or market incentives to minimize
pollution (Hearne, 1996). Since 1998, national environmental groups have been compiling TRI data, placing the information on their Web sites for an additional access beyond the EPA’s Web site, and annually listing the 12 top offenders in the “Dirty Dozen” club in an effort to put pressure on industry to change environmental and manufacturing practices. Numerous examples (e.g. Hearne, 1996) exist of TRI data being used by communities to exert pressure on industry to reduce emissions (e.g., B.F. Goodrich plant in Akron, Ohio).

Industry groups, such as the Public Environmental Reporting Initiative (2004), argue that public reporting of emission and other environmental and risk management data and efforts helps provide a strong connection between improved environmental reporting, improved environmental performance, improved organizational performance, and increased satisfaction of key stakeholders such as community residents and local governments. At the same time, numerous industry groups, as identified by Hearne (1996), have requested the EPA not to require this kind of chemical use listing because it is not a good indicator of risk because it is not the same as exposure. Her research identified numerous groups such as environmental, labor, and community organizations who all feel that chemical use information, though limited to TRI reporting, is an important component of risk analysis.

Grant’s (1997) findings indicate that, net of other predictors, states that provide substantial funding for community-right-to-know programs have significantly lower rates of toxic emissions over time. “Results are consistent with the arguments of conflict environmental sociologists, who suggest that, unless citizens are provided real resources
to mobilize their interests, citizen participation schemes will tend to be only symbolic gestures” (p. 859).

Of the research related to the effectiveness of the risk communication protocols of SARA Title III, and specifically the LEPCs, most of the research has focused on the creation of the LEPCs, their effectiveness at disseminating risk information, and the perspectives of the LEPC’s efforts from LEPC representatives’ perspectives. Conn, Owens and Rich (1990) summed up both the strengths and weaknesses of the LEPCs. Their research identifies that LEPCs are capable of sharing technical communication with community residents, but they lack sophistication in community dialogue, involving residents in the planning and research process, and fail to stimulate community dialogue. They cited the problems of promoting their existence, poor location of outreach offices, and the lack of assistance to the community in deciphering complicated manufacturing information.

Baram, Dillon and Ruffle’s (1990) case study research identified significant progress in chemical manufacturers’ reducing emissions, preventing accidents, planned emergency responses, and communicating risks to the public. Their research suggests that the changes were the result of internal initiatives rather than pressure from citizens groups or LEPCs. The EPA, however, reports that industry attention to public’s concerns is among the top reasons private companies take waste minimization actions (Szasz, 1994). Regardless, most of these research approaches, including Rich, Conn and Owens (1993) and Baram et al. (1990), focus on a limited number of case studies, and fail to address the influence of the threat of citizen pressure and mobilization as opposed to direct and immediate citizen pressure (Grant, 1997).
These types of legislation are in support of conflict environmental sociology literature (Schnaiberg & Gould, 1994). This line of research contends that pollution and security is a result of differences of power between industry and community residents (and other classes). In relation to community-right-to-know legislation, asymmetrical information flows among classes are part of the reason for pollution and other health and safety issues. Policies that address this asymmetry should reduce industrial pollution. Schnaiberg and Gould argued that compromise may not be the most effective means of resolution because compromise typically favors those organizations with higher power resources. Others (e.g., Grant, 1997) have argued that regardless of power structure, community-right-to-know provisions legitimate citizens’ demands and provide opportunities to mobilize resources.

One of the strongest arguments against community-right-to-know provisions is the lack of financial incentives or penalties for offenders. Peterson’s (1981) research argued that states are under pressure to raise tax revenues and thus are under pressure to lower environmental standards to attract capital and employees, thus likely to be more symbolic. Lindblom (1982) similarly argued that the economic market and the role of state governments as enforcers of such federal community-right-to-know policies limit states’ effectiveness.

Risk Management Plan (RMP)

Another part of LEPCs efforts includes the RMP. When Congress passed the Clean Air Act (1994), specifically section 112(r), it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The RMP Rule was written to implement Section 112(r) of these
amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop an RMP, including:

- a) Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases;

- b) Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and

- c) Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g. the fire department) should an accident occur.

According to the American Chemistry Council (2004; formerly the Chemical Manufacturers Association), the RMP is about reducing chemical risk at the local level. The industry uses a list of factors that can affect a company’s strategy to communicate RMP information with the community. These include:

- a) Proximity, size, and type of nearby community,

- b) Apparent community interest level in plant operations,

- c) Recent plant and safety and environmental performance,

- d) Plant complexity and worst-case scenarios,

- e) Presence of activists or aggressive news media,

- f) Community outreach status,

- g) Effectiveness of the LEPC,

- h) Economic importance to the community,

- i) Presence of other RMP-regulated facilities in the community, and

- j) Other significant factors such as labor/management relationships and environmental justice issues.
This information helps local fire, police, and emergency response personnel (who must prepare for and respond to chemical accidents), and is useful to citizens in understanding the chemical hazards in communities. The EPA anticipated that making the RMPs available to the public stimulates communication between industry and the public to improve accident prevention and emergency response practices at the local level. As of April 2000, more than 15,000 facilities have submitted RMP to the EPA (1994). However, following September 11, 2001 (9/11), RMPs were temporarily removed from public access.

**Responsible Care**

Responding to community-right-to-know initiatives and legislation in the early 1990s, numerous industry associations developed various risk communication protocols and programs. These include the American Institute of Chemical Engineers, American Petroleum Institute, and the National Propane Gas Association. The dominant industry association, however, is the American Chemistry Council, which developed the Responsible Care program to meet the requirements of SARA Title III. Responsible Care works to achieve improvements in environmental, health and safety performance. The guiding principles of Responsible Care include (American Chemistry Council, 2003):

a) To operate facilities and develop processes and products in a manner that protects health, safety and environment;

b) To lead in the development of responsible laws, regulations and standards;

c) To work with customers, carriers, suppliers, distributors and contractors to foster the safe use, transport and disposal of chemicals; and

d) To seek and incorporate public input regarding our products and operations.
The Responsible Care program established standards in six different areas: community awareness and emergency response (CAER), process safety, distribution, pollution prevention, employee health and safety, and product stewardship.

Part of the Responsible Care program includes the formation of community advisory committees or panels (CAC/P) that serve as a forum for public dialogue related to manufacturing concerns and risks. CAC/Ps are comprised of individuals, with membership drawn from a cross section of the community, who provide a link between the public and various organizations that operate in the region by providing counsel and recommendations on matters of public affairs and public policy.

CAC/Ps perform key functions for community residents, private interest groups, government, non-governmental organizations, and private industry. They are designed to improve the quality of services by encouraging closer ties between the public and organizations that have an affect on their community, and make for improved decision-making capabilities that involve perspectives from interested parties who participate in the process. CAC/Ps incorporate strategic community relations values such as the cooperation of key stakeholders, information and perception exchange, and the development of trust, sense of control, credibility, and consensus making. Through the implementation of public policy at the community level, CAC/Ps provide a level of accountability for government, non-governmental and private organizations, opening up decision-making and policy formation processes to concerned citizens, while providing resources for citizens to participate in the public policy process (American Chemistry Council, 2004).
The use of advisory committees is supposed to move the role of external input and influence to an internal advisory role working within the system. This public/private partnership facilitated by the role of the advisory committee is the “buckle that fastens the administrative process to the dominant institutions, elites, and value in society” (Cottin, 1973, p. 1140). The proliferation of and increased use and dependence upon advisory committees is a product of a response to the needs of the citizenry, the needs of government officials, and the demands of special interest groups to work together in reaching compromise and solutions to numerous public policy concerns (Petracca, 1994).

The western development and use of citizens committees can be traced back to England, where the use of such advisory groups for education and government was seen on a wide scale. In the United States, formal community advisory groups have been in operation since the first presidency. There was a significant increase in the number and types of community advisory groups during World War I, where many governmental commissions had citizens serving in an advisory capacity. Their role expanded during the depression of the 1930s, providing counsel on such topics as national illiteracy and emergency aid. During and following World War II, CAC/Ps expanded into areas of labor-management relations and post-war training programs for agricultural and industrial production (Stauffer, 1957).

At the federal level, the 1972 Federal Advisory Committee Act (P.L. 92-463) defined an advisory committee as any committee, board, commission, council, panel, task force, or similar group established in the interest of obtaining advice or recommendations for the president or one or more agencies of offices of the federal government. Federal advisory committees constitute one of the most significant vehicles for special interest
group representation and influence on the policymaking process of the national government (Petracca, 1994). This form of government by committee has been termed the fifth arm of the federal government (Anderson, 1979). The development and expansion of CAC/Ps have been driven not just by citizens' desires to participate in the public policy process, but also by national legislation aimed at increasing community input on vital issues. This approach is often called legislative citizen participation. In the past 20 years there has been a tremendous growth in legislated citizen participation in many areas. At present, most federal agencies have mandated citizen participation for many of their programs. The Mental Health Systems Act of 1980 (Public Law 96-398), for example, relies heavily on the voluntary efforts of citizens who advise and govern local community mental health center programs.

Typically, there are two types of CAC/Ps; short-term committees are organized to address specific issues and concerns for a finite time period, while long-term committees address specific as well as sweeping concerns and problems, providing continuous feedback from the community. There are some typical rules and responsibilities of CAC/Ps across a broad spectrum of organizations. Advisory committees are appointed when there is a definite function to be performed; they are appointed primarily to advise and are not typically requested to perform specific services. Their composition should represent the entire community related to the function to be performed, with membership representing various segments of community life ranging from lay representatives to acknowledged experts. Staff members typically are not appointed, but if they are, they constitute a minority of any such committee and the chairperson is chosen among the lay
members. Typically, the public is made aware of major recommendations, and the board or organization to which the committee reports controls public announcements.

The effectiveness and value of CAC/Ps in relation to chemical manufacturing have been questioned. David Hunter (1992), former editor-in-chief of Chemical Week, noted that the most beneficial aspect of the Responsible Care program has been the industry’s efforts to establish a dialogue with the public. Chemical Week’s former Gulf Coast Editor Gregory Morris argued that the CAC/Ps are not dialogic forums but rather vehicles to provide information asymmetrically: “These panels are not two-way streets” (Hunter, p. 5).

Positive impact of such measures is not a given. For instance, research has led to mixed reviews of LEPCs and CAC/P’s abilities to communicate environmental information to citizens. Heath, Bradshaw and Lee (2002) found a lack of awareness of their existence and low use of such organizations, while at the same time more than two-thirds of the residents surveyed approved of their intended functions.

Responsible Care Security Code

A recent addition to Responsible Care is the Responsible Care Security Code, developed in response to 9/11, the focus of which is to safeguard against potential terrorist attacks, expand industry relationships with law enforcement, and provide a model for chemical site protection. This security code, adopted June 2002, was developed in partnership with EPA, Office of Homeland Security, Federal Bureau of Investigation, Defense Department, Coast Guard and other agencies to protect citizens from possible threats.
Security has always been a high priority for the refining and chemical industry, but security related to terrorist threats was not a high priority before 9/11. Plant security issues focused on vehicle break-ins, theft, perimeter access, trespassing, personnel problems, bomb threats, and the like. Historically a second-tier industry issue when compared to health, safety and the environment, security came into its own in a significant way after 9/11. Two driving forces that led to an increased openness in security communications have been the ongoing and at times relentless media interest and a justifiably concerned public – primarily community residents near industrial facilities (Heath, McKinney & Palenchar, 2005).

According to the American Chemistry Council (2004), the purpose of the Security Code is to help protect people, property, products, processes, information, and information systems by enhancing security, including security against potential terrorist attack, throughout the chemical industry manufacturing chain. The Security Code uses a risk-based approach to identify, assess and address vulnerabilities, prevent or mitigate incidents, enhance training and response capabilities, and maintain and improve relationships with key stakeholders. Some specific examples include companies using tools to analyze the security of products sales, distribution, and cyber security; facilities protection actions such as the installation of new physical barriers, modified production processes, or materials substitution; measures to protect Internet commerce; additional screening of transportation providers; and maintaining open and effective lines of communication including steps such as sharing effective security practices with others throughout industry and maintaining interaction with law enforcement officials. The Security Code requires industry members to verify security enhancements through
independent third parties such as firefighters, law enforcement, and other state/federal officials.

Four other key information and communication programs related to the chemical industry are the Chemical Transportation Emergency Center (CHEMTREC), the Transportation Community Awareness and Emergency Response (TRANSCAER) program, the Chemical Sector Information Sharing and Analysis Center (ISAC), and the Emergency Response Mutual Aid Programs. When an emergency occurs, CHEMTREC provides first responders to the crisis with technical assistance from product safety specialists, toxicologists, and other industry experts to have the information and proper resources to appropriately handle the emergency. TRANSCAER provides information to communities through which hazardous materials are transported, offering community education, guidance in developing plans to respond to an incident, and training for local emergency responders. ISAC, established in June 2002, is a public-private partnership that shares vital security-related information between the multi-agency National Infrastructure Protection Center, which is based at the Department of Homeland Security, and companies that manufacture and use chemical products. The Emergency Response Mutual Aid Programs refers to programs among manufacturers of products that pose a very high risk if spilled or involved in an accident or catastrophe. These companies have developed a mutual aid agreement to provide immediate assistance in an emergency, agreeing that the closest capable response team will assist until the shipper or manufacturer of the products involved is able to take over at the scene.

A limited review of the chemical industry's steps to strengthen security at their facilities includes (American Chemistry Council, 2004):
a) Tightening access to facilities, including issues such as deliveries of materials and parking on site, and increasing perimeter protection such as strengthening fences and exterior walls, creating setbacks and clear zones that eliminate hiding places near a site’s perimeter, and installing additional lights;

b) Recommending to federal law enforcement officials that they should examine all licenses for drivers of hazardous materials;

c) Changing transportation standards, such as truck shipments cannot be left unattended and no stops can be made between the plant and delivery;

d) Communicating with local officials and briefing them on facility security efforts;

e) Using the industry’s existing risk assessment tools for national security purposes;

f) Permitting cleaning crews to work only during business hours;

g) Improving information security such as prohibiting radio conversations about sensitive topics, using voice encryption for some radio conversations, and prohibiting employees from giving out potentially risky information over the phone;

h) Increasing the number of properly trained security officers and developing a security center to monitor and support security processes;

i) Ensuring availability of backup systems for electricity, communications, water/sewer/gas, control centers and computer servers;

j) Improvements in marine and rail security, such as establishing protocols for actions that correspond with different Homeland Security Threat and Marine Security levels;

k) Improved security planning, training and drilling; and

l) Improvements in hiring and employment termination practices.

Research Questions

Developed from a literature review regarding risk communication and related social theories of risk, social construction of reality theory, narrative theory and rhetorical
enactment, culture, and community-right-to-know provisions, this research project asks

the following research questions:

RQ1: What risk roles do near neighbor community resident perceive themselves and others (individuals and organizations) in relationship to living in a community with a high concentration of chemical manufacturing, transportation, and storage facilities?

RQ2: How do near neighbor community residents' perceptions compare to previously identified risk communication process variables – harms and benefits, uncertainty, control, and trust?

RQ3: How do near neighbor community residents' risk perceptions of emergency response measures compare to some of those required by the following federal and industry community-right-to-know legislation, policies and guidelines: SARA Title III, LEPC, and Responsible Care?

RQ4: What are some key differences and/or similarities between the two communities regarding the near neighbor community residents’ risk perceptions and their role in the risk management and emergency response preparation process associated with the production, storage, and transportation of chemicals in their community?
CHAPTER 3
METHODOLOGY

Assumptions and Worldview

The fundamental concerns that lie at the heart of researchers' assumptions and worldviews (philosophy of science) antedate historical record by thousands of years. Assumptions and worldviews guide and base a philosophy of science in an attempt to understand order in the world, to explain why things happen, and why they ought to happen. The philosophy of science has been described as an effort to come to terms with the demand for unity and concern for issues and affairs that are difficult to discern, even those things that are beyond humans (Solomon & Higgins, 1997). While some philosophers suggest what is beyond us is mythological or cosmological, philosophers who study science from a positivist perspective suggest that what is beyond us is an underlying or constant truth. On the other hand, constructionists and emotionalists, for example, might argue that there is a relative ground in the pursuit of science due to the intersubjective nature of constructed reality.

Researchers' ontological, epistemological, and methodological assumptions guide assumptions and worldviews. Ontology refers to issues concerned with being, with what people believe and understand to be the case. For social science, ontological assumptions are those surrounding the nature of the subject matter of the research, namely the social world. Epistemology refers to the question of knowing and the nature of knowledge. Epistemological assumptions surround such issues as the basis of knowledge, the form
Methodology refers to the frames of reference of knowing that shape the selection of a particular set of data-gathering techniques.

The dominant ontological perspective of the past two centuries is logical positivism, that social nature is encoded in an objective reality with associated variables that can be identified, analyzed and interpreted, and causal relationships measured (Lincoln & Guba, 1985). Logical positivism suggests a structured and ordered world, a physical and social world that exists independent of people's perceptions. Research from a positivist orientation expects that, though different results may yield from different analysis of similar phenomena, findings will ultimately uncover and emerge with a consistent objective reality or truth (Hudson & Ozanne, 1988). This positivist worldview has dominated risk communication research (e.g., Krismky & Golding, 1992; National Research Council, 1989; Palenchar & Heath, 2002).

In contrast to positivists' belief in an objective reality, a naturalist perspective believes in multiple realities that are constructed by social beings as participants (Lincoln & Guba, 1985). Naturalism asks questions about what. This is the original, predominant language of qualitative research. A common orientation of naturalistic inquiry is to understand social reality on its own terms, working to gain rich descriptions of people and their interaction as they take place in their natural settings. Robert Park, University of Chicago, was one of the early pioneers of this approach. From a naturalist perspective, researchers assume that there is a "there" that you can get into and out of. There are issues as to whom the researcher is when embedded – researcher, participant, and hidden role – while assuming a subjectively stable environment and discourse, objects and
actions illustrative as empirical material. Naturalism draws on the work of symbolic interactionism, phenomenology, and hermeneutics, arguing that the social world cannot be understood by simple causal relationships or social events under universal laws. Naturalists advocate examination of phenomena holistically and in context in an effort to gain and produce a level of understanding (Lincoln & Guba, 1985).

A naturalist perspective based on symbolic construction leans more heavily on constructed reality as opposed to either a positivist or natural reality that is present for examination. Social meaning within constructed narratives, rather than information, causal relationships, or functions is the primary investigative. This orientation of meaning in communication studies is founded on three philosophical orientations: that humans use symbols to communicate, that reality is constructed and not discovered, and that symbolic activity is public and social (Pauly, 1991). From this orientation derives the notion of symbolic interactionism, which describes the symbolic relation between self and society.

Reality is then shared, subjective, and unstable. No two people have the same past experiences or interpretations about any object, person, or situation. This perspective suggests that reality is context-bound; as such it is socially created rather than some objective, pre-existing, non-subjective, and stable reality. Each person has a basic understanding of symbols/words but they each form their own perceptions and interpretations of what those symbols/words mean. With words, people internalize and externalize thoughts (Burke, 1961), and people share and manage their sense of reality through social interactions (P. Berger & Luckmannn, 1966). Individuals and groups have a strong instinct for creating systems of meaning and symbolic interaction (Burke, 1966).
Two primary orientations guide this study: meaning and reality exist through human interaction with others and self, which allows meaning to develop over time as individuals interact with others, compare and adjust those interpretations and self-consciously reflect upon their varied experiences (Taylor, 1994); and that socially constructed meaning and reality exist and can be interpreted in reconstructed narrative (Fisher, 1984).

**Researcher Subjectivity**

In qualitative investigations, the researchers have been described as a kind of instrument themselves who sort and search for patterns (McCracken, 1988). Weber (1968) coined the method “verstehende sociologie” about the sociology of meaning, which lays a foundation for ethnographic fieldwork to avoid researcher interjection. This, Weber and others argued, is required to develop and maintain a close relationship with those who are part of the case study, relying on them for information about actions and behaviors and what it all means to them, all the while maintaining a social scientist’s distance that allows for neutral analysis. Intuitively, this case study follows this approach of creating distance between what you study and yourself.

Qualitative researchers are not certain and cannot claim commonality with the participants in their research projects. A researcher’s goal is to render plausible the terms by which individuals and groups explain themselves to the world and clarify the role that communication plays in such explanations (Pauly, 1991). Qualitative research is geared toward capturing unique meanings from the social actor’s perspective rather than verifying the researcher’s theory (Taylor, 1994).
A natural, social constructionist perspective acknowledges the role the researcher plays in understanding and interpreting research. Described as bracketing (Gubrium & Holstein, 1997), which was developed from the work of Alfred Schutz (trans. 1967), researchers analyze and acknowledge their own personal and cultural assumptions in an effort to avoid unknowingly prescribing these points of view to the topic, individuals and groups, and questions being analyzed.

The researcher’s interest has developed from both an academic and professional interest in the area of risk communication and community perceptions of risk related to chemical manufacturing. The researcher has worked for an oil-and-gas boutique public relations agency, and continues to this day to conduct risk communication research for various organizations including private chemical companies, federal regulatory agencies, city governments, academic institutes, and regional manufacturing associations. From these professional experiences, several researcher orientations and subjectivities should be acknowledged:

a) Most prior risk communication research has been dominated by a scientific, actuarial perspective that assumes risk can be objectively calculated.

b) Most prior risk communication research has failed to acknowledge the social constructionist perspective toward risk perceptions and associated behaviors, focusing more on scientific or public policy perspectives.

c) Most prior risk communication research has been conducted from a corporate-centrist perspective in an effort to generate data related to industry support rather than explanations of such phenomena.

d) Most prior risk communication research has failed to acknowledge the role of community residents, who as risk bearers have a right to determine their role and behavior in complex risk scenarios, even if it is to their detriment.
Research Design

After addressing ontological orientations and related researcher subjectivities, as well as defining research interests and points of inquiry within the literature review and the development of appropriate and achievable research questions, elements of the research design were the next methodological step. The first step in the research design was to identify the population of the research project. This step has been described by Miles and Huberman (1994, p. 25) as “bounding the territory.”

Attention was focused on two high-risk communities. A broad review of a variety of different types of communities dominated by chemical manufacturing facilities was conducted in an effort to recruit resident participants who lived in proximity to a high concentration of chemical manufacturing, storage, and transportation facilities. Efforts were made to identify two drastically different communities in the same geographic region that would allow for some limited comparative analysis, and the researcher sought an eclectic array of community residents’ backgrounds, experiences, and perceptions as a heuristic to help uncover and identify as many themes and narratives as possible. One of the primary differences sought between the two communities was the level of sophistication in the development and application of emergency management risk communication campaigns conducted by the chemical industry and related governmental organizations.

Thus, the Texas-Louisiana Gulf Coast, and the Houston Ship Channel in particular, was identified as an ideal location to conduct this ethnographic case study. Often referred to as the “Chemical Coast” by industry or as “Cancer Alley” by health
Kevin and Devon activist organizations, this region has the largest concentration of petrochemical plants in the United States.

The Houston Ship Channel, located in Harris County, opened in 1914 and began to attract refineries after the end of World War I. According to the Environmental Defense Fund (2003), Harris County ranked among the dirtiest/worst 10 percent of all counties in the United States in terms of air releases and in terms of an average individual's added cancer risk from hazardous air pollutants, and ranked among the dirtier 30 percent of all counties in the United States in terms of land releases. Within the Houston Ship Channel area, there are a large number of communities that are dominated by manufacturing industries. Previous research (Heath & Abel, 1996; Heath, Abel & Douglas, 1996; Heath & Palenchar, 2000; Palenchar & Heath, 2002) identified some of these cities based on the amount and duration of their emergency preparation (e.g., installation of siren systems) and their risk communication efforts (e.g., Wally Wise safety education campaign). Specifically, characteristics profiled for this designation include:

a) Proximity/size/type of nearby community,

b) Apparent community interest level in plant operations,

c) Community outreach status,

d) Effectiveness of the LEPC,

e) Economic importance to the community, and

f) The presence of other RMP regulated facilities in the community.

Three distinct classifications of risk communities have been identified in relationship to risk communication and emergency preparation efforts (Heath & Abel,
that address the designated profiles of this research project. Briefly, the first community classification is defined as a higher profile city, one with a longer record of community outreach, larger communication budget, and more resources utilized in the emergency response preparation and risk communication campaigns. The two other community classifications were moderate profile and lower profile either because of a smaller emergency outreach budget per capita or because the implementation of warning systems and community-based emergency response was less well developed. This study examined individually as well as compared/contrasted one higher profile community (Deer Park, Texas) and one lower profile community (Galena Park, Texas) from the Houston Ship Channel region.

Data collection and analysis were conducted with residents who live in either Deer Park or Galena Park’s near neighbor, manufacturing facilities geographic corridor. This residential and business corridor typically incorporates less than one-to-two square miles that surround hazardous manufacturing facilities. Near neighbor zones are identified by city emergency management departments, in coordination with industry and trade associations, and city and state emergency response teams. The near neighbor community zones studied for Deer Park include Zone 1 through Zone 3, and the near neighbor community zones studied for Galena Park include Zone 0 (some community residents live in industrial zone) through Zone 3. However, residents and visitors who do not necessarily live in the near neighbor community zones were at times part of the study.
**Data Collection Method**

Participant observation, ethnographic interviews, and focus groups are the three primary research means utilized for gathering data. D. Morgan (1997) and others have emphasized the value of cross-validation of qualitative research tools as a means to address validity and reliability issues related to qualitative data collection. Overall, the benefit of triangulation is increasing the value of the data collected. "The goal of triangulation is to strengthen the total research project, regardless of which method is the primary means of data collection" (p. 31).

Triangulating the participant observation to interviews and then to focus groups allows the researcher to explore perceptions in more detail that came up during the participant observation process and to clarify areas where there seem to be different viewpoints with the individual respondents during the focus groups. This project also triangulates focus groups with participant observation as a means to develop a more sophisticated and deeper insight into the community constructed narratives. Interviews and focus groups also were used as a means of the constant comparative method itself, a fundamental methodological approach of this project. It is also an appropriate means to test the researcher's understanding of the phenomena studied (D. Morgan, 1997).

Also, the use of a research assistant who spoke Spanish was initially considered an integral part of the research design. The research assistant has worked with this research in past projects (Heath & Palenchar, 2000; Palenchar & Heath, 2002) and is trained in risk communication studies, translation services, and interview and focus group data gathering techniques. While the researcher has a limited understanding and use of Spanish, there were numerous times throughout the research project that a Spanish
translator was used to assist in the participant observation, interviews, and focus groups. While this assistance was beneficial at times, it was not the critical requirement that was expected, as almost all of the daily communication, as well as interviews and focus groups, were conducted in English.

**Sampling Strategy**

Regarding the selection of participants during all three research phases, purposeful sampling was based on the researcher’s conceptual focus of near neighbor community residents, taking into consideration key interests such as setting, persons, activities, events, and time. “Qualitative sampling is purposeful because its practitioners strive to locate themselves at the sites of specific communicative performances and practices” (Lindlof, 1995, p. 126).

Participants for both the interviews and focus groups were systematically gathered from the relationships, networks, contacts, and general community knowledge developed during the participant-observation research phase, while other participants were identified during the pre-test stages of the research project. Specifically, snowball-sampling techniques were utilized, developing sources from within the community. More importantly, however, is that snowball sampling enables the researcher to develop samples that represent social networks in the community (Lindlof, 1995), providing an opportunity to examine the community social construction orientation of the risk communications process.

**Participant-as-Observer**

Participant observation provides an excellent qualitative research tool for analyzing poorly understood phenomena, such as the social construction and justification
of community residents’ risk roles and perceptions. Lindlof (1995) suggested two major benefits of participant observation that have direct implication for this study: the researcher becomes skilled in the standards and performance of the group(s) being studied, and the researcher improves ability to create detailed and theoretically informed descriptions.

The first issue addressed is the choice of ethnography as a qualitative, methodological approach. Ethnography was originally developed by anthropologists and sociologists (e.g., Tocqueville) during the early 19th century. Early on, there were no formal rules for avoiding the imposition of researcher on the data collected until numerous researchers argued that to understand human society and their behaviors, social scientists should not impose their own views on gathering, analyzing, and reporting data.

Ethnography is based on extensive field observations. The researcher immerses himself or herself in the lives of the people being studied. By participating in the lives of consumers, community residents, employees, or whoever forms the focus of the study, the researcher’s goal is to attempt to understand and experience the problem from the perspective of those being studied. According to D. Morgan (1997), three major advantages of participant observation are collecting data on a larger range of behaviors, a greater variety of interactions, and a more open discussion of the research topic. Field studies can be conducted from several different perspectives: observe the context, observe and participate in the context, or participate and observe in the context — all different degrees of the researcher’s role varying from less to more participation.

This case study combined both participating and observing. Observation provides some depth to understanding perceptions and behavior, but participant-as-observer
approach provides a better tool for analyzing this phenomenon. Through participation while observing, a researcher can gain a rich sense of the community residents, a more thorough appreciation of their particular intentions, motives, behaviors, rules, and values. Participant observations within normal situations are useful to see how individuals communicate and behave (Becker, 1958).

The researcher had an openly acknowledged research purpose, participating in the environment to the extent negotiated with near neighbor community residents and local organizations. The creation of data-texts was an ongoing part of the participant-as-observer methodology, building data until new themes failed to reveal themselves. Scratch and head notes, extensive field notes, journals, and documents were utilized, with a nightly review of data collected standard research protocol.

Depth, Ethnographic Interviews

Depth, ethnographic interviews (those that occur in the course of participant-observation studies) were utilized to gauge near neighbor community residents' risk roles and perceptions toward related to living in a community with a high concentration of chemical facilities. Major research areas include residents' health, safety, and environmental risk perceptions; residents' perceptions of their relationship with key risk generators and arbiters; and residents' perceptions of their role in emergency response preparation protocols.

Interviews were conducted at two points in time: part way through the participant observation and prior to the focus groups. Consistent with qualitative approaches, however, data were collected until no new themes emerged in later interviews. Interviews were conducted in the participants' homes unless a neutral site was preferred.
Interviews lasted between approximately 30 and 50 minutes. Interviews began with broad, grand tour questions followed by more specific questions, inviting the participants to describe their own perceptions in their own words. It was anticipated that as the number of interviews conducted increased, there would be an increase in the use of more specific questions to test previous findings and expand on theoretical issues, which was the case. Field notes were recorded after each interview to provide the most accurate collection of data and observations. Written memos were used as a device for ongoing evaluation of data, questions, and the decision to end data accrual.

Focus Groups

Focus groups were conducted at one point in time: following the depth, ethnographic interviews but while still remaining in the community. Focus groups were utilized to gauge near neighbor community residents' risk roles and perceptions related to living in a community with a high concentration of chemical facilities. Major research areas addressed include residents' health, safety, and environmental risk perceptions; residents' perception of their relationship with key risk generators and arbiters; and residents' perceptions toward their role in emergency response preparation protocols.

The appropriate number of focus groups is a primary dimension of focus group qualitative research projects (D. Morgan, 1997). Typically, six to eight or more focus groups are required for detailed content analysis. For exploratory research with a moderate-imposed structure to identify perceptions, it may take only a few focus groups to get to the point where a researcher can anticipate what might be said (D. Morgan, 1997). Broom and Dozier (1990) recommended the use of one or more focus groups (as
required) to pre-test questions and gain an appreciation for the subject matter under investigation.

Optimal group size is between six and 10 participants (D. Morgan, 1997). Groups on the smaller end of the scale are typically used for detailed analysis where a clear sense of each participant's reaction to the question is required. Smaller groups tend to be more costly and less productive. Larger focus groups are sometimes utilized to determine participants' symbolic convergence related to attitudes, behaviors, and actions (Cragan & Haas, 1987; Cragan & Shields, 1995). D. Morgan (1997) suggested that if the research goals are purely exploratory, then running a few large groups might well provide a "quick and clean solution."

A fair amount of homogeneity is required to foster discussion (D. Morgan, 1997). Following participant observation, the research design identified focus groups based on gender or ethnicity (along with a few age) characteristics that have been identified during the participant-observation and interview phases. Consistent with qualitative approaches, however, data were collected until no new themes emerge in later focus groups.

The level of moderator connection with focus group participants was a combination of low and high moderator involvement called the "funnel" approach. According to D. Morgan (1997), this approach begins with low moderator involvement, which provides time for discussion, but then poses more specific questions on the research topic.

**Feasibility and Emergent Design**

One key aspect of qualitative research is the role of emergent design, that research projects require adjustments and alterations to research protocols as required by the
individuals and context being examined, before initiating and during the research project (Lincoln & Guba, 1985). Research steps were taken to develop and adjust research protocols following the initial research design.

First, a preliminary environmental scan was conducted to test the feasibility of this research project. Four months prior to initiating this study in the spring of 2003, the researcher visited three communities for two days each to test informally observation-participant. The intent was to explore potential challenges such as access into the community, living accommodations, to ascertain if residents are or would be willing to discuss perceptions of living in their communities, and how comfortable would residents be in self-disclosing and describing their roles and perceptions. These initial results yielded several important findings:

a) That community residents appeared comfortable in sharing their stories, experiences and concerns about living in such communities,

b) That most of risk perception discourse is event driven and thus might influence the research design, and

c) That time spent networking and using snowball sampling based on access from community leaders would be important to observing and participating in the community, let alone gaining access.

Interview and focus-group protocols were pre-tested in several other research projects conducted with residents of both communities identified for this research project (Heath & Palenchar, 2000; Palenchar & Heath, 2002), limiting concerns about the effectiveness of these data gathering techniques.

Summary of Data Collection and Information Pool

The research design directed three different research tools. The researcher was an observer-participant in the two communities for a total of 193 days. The researcher lived
in the high-profile community for 92 days, with 63 days spent observing and participating in the community. The researcher lived in the lower-profile community for 101 days, with 71 days spent observing and participating in the community.

The researcher conducted 27 interviews, with 12 in the high profile community and 15 in the lower-profile community. Fifteen focus groups were also conducted, with six in the high profile community and nine in the lower profile community. Interviews and focus groups participants were distributed to represent a cross-section of both residents who lived in the near neighborhood sections of the communities (previously defined), with distinctions being made for ethnicity (Hispanic, African-American, white), age (more than 18 years old), gender, and direct employment in the industry. Observation participation, interviews, and focus groups took place over the course of almost seven months, from mid July 2003 through late February 2004.

Residents who participated in the research project come from a wide variety of background, demographic characteristics, work experience, and community history. The ages of residents who participated in either the focus groups or interviews from both communities ranged from a recently graduated 18-year-old junior college freshman to a 73-year-old retired man who lived in an assisted living center. Occupations were as diverse as most communities, including teachers, students, homemakers, professionals, blue-collar workers and laborers, civil employees, hourly service workers, and small business owners. Interviews included 14 females and 13 males, while focus groups consisted of four all-female groups, two all-male groups, and nine combined-gender groups. Ethnicity distribution was approximated to 2000 census data, and none of the
participants in either the focus groups or interviews worked directly for the chemical industry.

Most interviews were conducted at the residents' apartments or homes. Three were conducted in local community centers and four were conducted in an apartment complex clubhouse. Focus groups were conducted in a variety of settings, including community centers (5), apartment complex clubhouses (4), day spas, beauty shops, barbershops (3), and private homes or other small businesses (3).

Observation participation entailed a wide variety of data collection means. Typical means of observing and participating in the daily life of the community include:

a) Listening to or directly joining residents at community bakeries, coffee shops, lunch stands, and restaurants;

b) Walking around and jogging;

c) Attending formal community events such as holiday celebrations, city memorials, and non-governmental organizations' fundraisers such as barbecues;

d) Attending informal community events such as soccer matches, neighborhood picnics, and residents "squatting" on their porches together;

e) Attending school functions such as plays, musical performances, sporting events, and neighborhood restoration projects;

f) Invited to lunches and dinners in private homes;

g) Meetings with civic, government, and business leaders;

h) Attending church events such as fundraisers, morning and evening services, and religious holiday celebrations;

i) Browsing and shopping in community stores and service providers; and

j) Running common errands as part of living in a community – paying local bills, going to the library, going to the post office, purchasing newspapers, and dropping off /picking up dry cleaning.
Transcript Quality

The researcher transcribed the data as part of the ongoing process of learning about the community. As Whyte (1984) noted about data collection in regard to his seminal ethnographic case study *Street Corner Society*, part of his learning about, understanding, and appreciating the community evolved from his daily transcription of field notes.

The means of transcript acquisition for the depth, ethnographic interviews and focus groups was audiotape. The researcher provided the appropriate equipment, with a 360-degree microphone, tape recorder, blank tapes, and spare batteries. The audiotape provided a recording of the focus group discussions and did not appear to be intrusive for the participants. While videotaping provides a visual and auditory representation of the actual focus group in progress, D. Morgan (1997) cited two reasons why videotaping should be avoided. First, it does not provide an abundance of useful information. Although the purpose of videotaping is to capture facial expressions and group dynamics, such detailed observations require several cameras and additional lighting. Most data analysis is based on transcripts from audio recordings and not video recording. The second reason videotaping was avoided involves invasion of privacy issues. According to Lindlof (1995), the use of cameras can distort participants' attention and heighten their feeling of being watched. Videotaping is common in marketing research but is not typically utilized in social science research. Third, the focus of analysis was on the narrative and narrative elements of conversation as opposed to the nuances of non-verbal gestures or specific elements of speech patterns that could be aided with the availability of video.
Emerson, Fretz and Shaw (1995) argued that the quality of transcription is also very important to rigorous qualitative research. Verbatim is the goal but is a problem because it does not often take into consideration nonverbal and emotion, such as paralanguage and proxemics. The use of field notes, journals, and transcriptions acknowledges the socially constructed nature of research, not a quasi-positivist approach where a transcript freezes in time; it is still open to multiple interpretations and changes with every fresh reading of the data. Other issues such as reflexivity, deliberate or accidental data alterations, and the quality of transcribers were also addressed prior to collecting data. Also, transcriber training was conducted during a pre-test of the research protocols in an effort to examine the guidelines and syntax used prior to data collection. An assessment of the trustworthiness of the transcription was conducted, based on a review of selected transcripts in the context of an explicit acknowledgement of the interpretive nature of the transcription process (Emerson et al., 1995).

Fieldnotes Quality

There are a wide variety of manners and examples regarding how to write and analyze fieldnotes. Ethnographers, however, can move beyond the impasse created by differing perspectives on fieldnotes by making explicit the assumptions about the nature of ethnography as a set of practical research and writing activities (Emerson et al., 1995). Overall, the researcher wrote down in regular, systematic ways observations and conversations that occurred during the course of participating and observing in the daily lives of others, creating an accumulated written record of observations and experiences. Developed from Emerson et al.’s (1995) work, four basic perspectives toward writing fieldnotes grounded this research project:
a) What is observed and ultimately addressed as data is directly linked and inseparable from the observation process.

b) Writing fieldnotes requires a unique attention to the indigenous meanings and concerns of the residents studied.

c) Contemporaneous fieldnotes are a key component and resource for developing and writing broader and more coherent accounts of residents’ perceptions, lives and concerns.

d) Fieldnotes detail the social and interactional processes that make up individual residents and the communities everyday lives and activities.

The researcher observed and participated in the social life of the community. At first communication and observations were recorded as jottings, noting initial impressions, then focusing on key events and incidents, acknowledging personal reactions to these events, and ultimately moving beyond personal reactions to an open sensitivity to what the residents in the setting experience and react to as significant (Emerson et al., 1995).

Following this jotting down procedure, the researcher wrote up more extensive fieldnotes. From these bits jotted down, the researcher developed sketches of social scenes, identified recurring incidents and narratives, noted unique and local expressions, explored residents’ distinctions and accounts, and detailed dialogue among those present (including the researcher). All attempts were made to write fieldnotes up immediately after leaving the setting, in an effort to produce fresher, more detailed recollections about the day’s events and conversations. Typically, participation in the field lasted only one or two hours at a time, allowing ample time to reflect and expand on the gathered data. Initial jottings were collected in a small notepad, visible and open to the residents. That was followed by typing notes with a computer.
Writing up the fieldnotes was developed from a third-person point of view that allows the researcher to express thoughts and feelings, while maintaining the primary focus of describing what others are saying and doing (Emerson et al., 1995). This writing format is effective for conveying the residents’ words and actions.

It is important to acknowledge that fieldnotes represent inscriptions of social life and social discourse. Geertz (1973) described this as the core ethnographic process. “He [researcher] writes it down. In doing so he turns it from a passing event, which exists only in its own moment of occurrence, into an account, which exists in its inscription and can be reconstructed” (p. 19).

Strategy for Analysis

Analyzing qualitative data is a continuous process that occurs throughout the course of study (Lindlof, 1995). The use of an open-ended approach to data analysis lends itself to a more thorough and rich understanding of the phenomena being studied. However, reduction, explanation, and theory issues were addressed prior to conducting the study. Reduction – sort, categorize, prioritize, and interrelate data – followed emerging schemes of interpretations (Lindlof, 1995) utilizing the constant comparative coding method (Glaser, Barney & Strauss, 1967). The benefits of this coding approach are the means by which theory is grounded in the data, and the explicit means for organizing and conceptualizing data throughout the process (Lindlof, 1995).

Data collection and analysis focused on the actors, scene, initial and sustained interactions, how do actors claim attention, principal actors meeting and interaction, and the significance of physical and communication events (Lindlof, 1995). At the same time, data collection and analysis remained open to community residents’ perceptions and
roles both anticipated and not anticipated. The creation of data-texts was an ongoing part of the participant-as-observer methodology, building data until new themes failed to reveal themselves.

Taylor (1994) argued that incorporating multiple perspectives on meaning throughout a research project provides stronger data sets and improved data analysis. He identifies three theoretical orientations that guided analysis: meaning and reality exist in the reconstructed narrative, meaning and reality exist through interaction, and meaning and reality exist in contrast. Primarily, however, data were analyzed as reconstructed narratives that are socially constructed. Meaning and reality exists in the reconstructed narrative or that meaning comes out of the retelling of the individual’s or group’s experiences. This type of interviewing and data analysis relies upon respondents’ memories as the source of meaning as developed from the individual lived experience.

Evaluative interpretations, checking for reliability, and validity are an area of concern for all methodologies. Triangulation, member checks, and leaving the field at the appropriate time (theoretical saturation, taken-for-grantedness, heightened confidence; Snow, 1980) provided a standard measure of certainty to the data. While the resulting stories are shared without note citations (see Chapter Four), the analysis, results, and discussion section (see Chapter Five) includes citations within the data text arranged in the following order: city (DP = Deer Park; GP = Galena Park) – type of data set (OP = observation-participation field notes; PI = personal interview; FG = focus group) – catalogued number of data set – page number on transcript or field notes. For example, DP-FG-2-7 cites that the narrative comes from the second focus group conducted with residents in Deer Park, page seven.
Overall, the development of four levels of data analysis also provided a standard measure of certainty to the data and analysis: comprehending the data collected while keeping the literature at bay; synthesizing and merging the stories and experiences to describe a typical, composite pattern of communication and behavior; a level of theoretic activity; and recontextualizing the data. The overall goal of the project and subsequent methodology was to become a sharper, more intelligent, and more grounded researcher who uses the appropriate method required to answer basic questions that need to be asked, rather than a directed researcher.

**Limitations of this Study**

The search for patterns in human communication and responses is fundamental to research. While this dissertation addressed those commonalities and patterns, it did not build on exploration of exceptions. For the most part, negative cases or exceptions to identified experiences were not considered to the extent that should be required, thus compromising a level of scientific objectivity.

Another limitation of this ethnographic case study is in relation to some confusion regarding etic and emic data reporting. Emic data, derived from the residents that address meaning ascribed to the phenomena, were interlaced with etic data, derived from the researcher's observation and participation that described awareness, knowledge, and behaviors. Though attempts were made to differentiate the data, the differences between what residents said and what they did often overlapped in data analysis and in writing up the results and subsequent discussion.

A third limitation of this study was a reliance on data pertaining to what residents shared and what was observed and experienced, without including the products of the
residents’ activity, such as documents, mass media materials, and community records. While a partial review of such residents’ activity was conducted in providing a context for the community, as well as in the selection process during pre-testing, more materials could have been incorporated into the overall analysis and discussion of community risk perceptions and knowledge of emergency response protocols.

A fourth limitation is in regard to the amount of data collected and the temporal limitations of writing a dissertation. While a vast amount of data were collected, much of it was beyond the scope of the research questions addressed in the study and the practical limitations of completing a dissertation. For example, four major discussion items regarding the research questions were developed, addressed, identified, and explicited in relation to the research questions asked and the most apparent themes for discussion. However, the discussion items list could have increased several fold without time and resource limitations. Thus, at times major themes were highlighted and discussed at the expense of minor themes. Overall, this limitation presented and framed objects in a particular way, missing other ways that events might have been developed and framed (Emerson et al., 1995).
CHAPTER 4
SITUATING THE RESEARCH

"Houston's spring: Birds sing, Flowers bloom and smog returns"
(front page headline, Houston Chronicle, March 31, 2004)

Community Context of Harris County, Texas

Chemical manufacturing and oil refining are a key element in the American lifestyle and economy, and a critical element in the nation's infrastructure. The chemical industry is a $460 billion enterprise with more than one million workers in the United States, producing more than 70,000 different products ranging from petroleum used to lubricate motor vehicles, bicycles, strollers, and other things with moving parts to the production of planes, automobiles, paints, inks, drugs, fertilizers, clothes, and plastics. It is the nation's largest exporter, accounting for approximately 10 percent of U.S. exports. Chemistry companies invest more in research and development than any other private business sector, accounting for one in every seven patents awarded each year in the United States (American Chemistry Council, 2004).

Within Texas, the chemical manufacturing industry remains one of the largest economic forces in the state. Texas has 1,115 businesses in the state that are directly related to chemical manufacturing, employing almost 78,000 state residents with an annual payroll of approximately $4 billion. The Texas chemical manufacturing industry generates more than $67 billion in shipments, sales, and receipts (U.S. Census Bureau, 2000).
In Houston, the oil and chemical industry is the foundation of more than 6,000 energy-related companies (Marland, 2004). According to the Greater Houston Partnership (2004), approximately half of the region’s economic base is directly related to energy. Houston and surrounding communities have 30.2 percent of the nation’s jobs in crude petroleum and natural gas extraction, 14.9 percent of oil and gas field services jobs, and 42.5 percent of oilfield machinery manufacturing jobs.

The Houston Ship Channel, which separates Galena Park from Deer Park, links Galveston Bay-Gulf of Mexico with more than 100 major industrial facilities. The Port of Houston Authority owns and operates the public facilities located along the Port of Houston, a 50-mile-long complex of public and private facilities that handle more than 175 million short tons of freight worth more than $60 billion annually.

Since the time the Houston Ship Channel was launched as the Harris County Ship Channel Navigation District in 1909, according to Hensel (2003, p. 5D), the Port of Houston “has been a product of audacious engineering and political influence.” With about 6,000 ships passing through the channel annually, the port of Houston is one of the nations largest in foreign cargo tonnage and serves most of the Gulf Coast refineries with their oil imports. The volume of marine cargoes of raw materials and finished products to and from the facilities make the channel one of the nation’s busiest waterways. Often referred to as a “target of opportunity” along with airlines, airports, nuclear power plants and other critical infrastructures, the Houston-area refining and petrochemical facilities (industry) have been at the front line of intensified security assessment and enhancement since 9/11. Former U. S. Department of Homeland Security Secretary Thomas Ridge identified Houston as “one of seven cities most vulnerable to a terrorist attack, based on
criteria that include population density and intelligence squeezed from al-Qaida

According to the Environmental Defense Fund (2003), in 2001 Harris County
ranked among the dirtiest/worst 10% of all counties in the United States in terms of air
releases. Five of the 20 largest polluting facilities within Harris County are in Deer Park,
including TM Deer Park Services L.L.C. (2.76 million pounds), Deer Park Refining
Limited Partnership (2.02 million pounds), Rohm & Haas Texas Inc. (1.08 million
pounds), Shell Chemical Co. Deer Park (1.04 million pounds), and BP Amoco Polymers
Deer Park Facility (472,000 pounds). The top 10 major pollutants that are reported in
TRI sources in 2001 include methanol (5.7 million pounds), ethylene (3.4 million
pounds), propylene (2.87 million pounds), nitrate compounds (2.51 million pounds),
ammonia (1.38 million pounds), sulfuric acid (1.24 million pounds), styrene (1 million
pounds), toluene (940,00 pounds), vinyl acetate (905,000) and ethylbenzene (903,000
pounds).

Harris County ranked among the dirtiest/worst 10% of all counties in the United
States in terms of the number of people living in areas with non-cancer risk from
hazardous air pollutants, with 3.38 million people who face a cancer risk more than 100
times the goal set by the Clean Air Act. However, only 5.9 percent of the air cancer risk
is from point sources that include major industrial facilities like chemical plants, steel
mills, oil refineries, power plants, and hazardous waste incinerators. Point sources are
defined as those that emit 10 tons per year of any of the criteria pollutants or hazardous
air pollutants or 25 tons per year of a mixture of air toxics. Harris County has 13
Superfund sites, though none of these Superfund sites are in Deer Park or Galena Park.
In 2001, this county ranked among the dirtier 30 percent of all counties in the United States in terms of land releases.

Scorecard's 2001 TRI data are derived from the reports of almost 20,000 industrial facilities. Seven "new" industries (e.g., metal mining, electric utilities, commercial hazardous waste treatment) were required to report their release and waste management data for the first time in 1998, substantially increasing the total amount of chemicals tracked by TRI.

There are always debates about the numbers reported to state and federal regulatory agencies as required by the Clean Air and Water Act. For example, the Galveston-Houston Association for Smog Prevention (2002) (GHASP), reviewing findings of the Texas Commission on Environmental Quality, argues that the chemical plants and refineries in Texas release three times more pollution than they report to state and federal agencies, far more than their permits allow. The discrepancy, GHASP argues, is due to grandfather exemptions, permits that allow leaks and conflicting data that result in no action.

Throughout the Houston Ship Channel operates a large number of government, private and public health, safety, and environmental organizations related to chemical manufacturing, transportation, and storage facilities. This list includes large federal agencies such as the EPA, industry associations such as East Harris County Manufacturers Association (EHCMA), international environmental activist organizations such as Green Peace, moderate-sized, regional, non-profit health organizations such as GHASP, and small, poorly funded local community activist groups such as Women Acting for Smog Prevention.
Community Context of Deer Park, Texas

Deer Park, Texas, located in the industrial section of central Harris County, was named after a private park for deer. In 1896 the community had a population of 40, and by 1940 the population had increased to 100 and remained an unincorporated area that included a local post office and four local businesses. By 1946 the area began to expand as Deer Park became the site of petrochemical refineries and toluol (a flammable liquid derived from coal tar and petroleum) plants for the production of trinitrotoluene (TNT). Other industries manufactured plastics, paper products, carbon, concrete products, and alkali materials. The city was incorporated in 1948, the first major subdivision was developed in 1955, and by 1967 the number of subdivisions expanded to 25. From 1970 to 1990 the population continued to increase, reaching a high of 27,652 in 1990 (Deer Park, Texas, 2003). Deer Park currently has 28,520 residents (U. S. Census Bureau, 2000).

Elevator, Valvoline and Vopak Industrial Services USA Inc. The largest and most prominent facility in Deer Park is the Shell Deer Park facility, the sixth largest refinery operating in the United States with a crude oil capacity of 340,000 barrels a day. Within the past two years, 12 of these facilities have been in violation but not in significant violation, and four presently are currently designated as a high priority violator under the Clean Air Act or is in significant noncompliance under the Clean Water Act or the Resource Conservation and Recovery Act (RCRA). These designations indicate violations by point source dischargers of sufficient magnitude or duration to be a regulatory priority. Removal from the significant violator list varies somewhat by program. For example, for air emissions, sources continue to be considered high priority violators until they are in full compliance and all penalties are paid.

According to TRI reports (July 25, 2003, using reporting year 2000 data, which are the most recent TRI data available) at the start of this study, the following industries have on-site and off-site reported releases ranging from chloromethane to ammonia to propylene, from plants including AKZO Nobel Polymer Chemicals L.L.C., BP Amoco Chemical Co., BP Amoco Polymers D.P., BP Solvay Polyethylene N.A., Deer Park Refining Ltd., Equilon Lubricants Co. Deer Park, Global Octanes Corp., Lubrizol Corp., Oxy Vinlys L.P., Oxy Vinlys L.P. Deer Park VCM Plant, Resolution Performance Products, Rohm & Haas Texas Inc., Rohmax USA Inc., Safety-Kleen Deer Park Inc.,Shell Chemical Co. Deer Park, Solvay Interox Inc., S SE MFG. Inc., TM Chemical L.L.C., TM Deer Park Services L.L.C., Valvoline and Vopak Industrial Services USA Inc.
TRI data from these facilities include 1.36 million pounds of fugitive air releases. Fugitive air emissions are all releases to air that are not released through a confined air stream. Fugitive emissions include equipment leaks, evaporative losses from surface impoundments and spills, and releases from building ventilation systems. Stack air emission, which are air emissions that occur through confined air streams such as stacks, vents, ducts or pipes, accounted for 2.6 million pounds of release. Total on-site releases, which is the sum of total air emissions, surface water discharges, underground injections and releases to land, accounted for 8.68 million pounds of releases. Total off-site releases, which include metals and metal compounds transferred off-site for solidification/stabilization and for waste water treatment, accounted for 950,000 pounds of releases.

According to the U.S. Census Bureau (2000), females make up 50.3 percent of the total population. The median age of a resident is 34.7 years, the median household income is $61,334, with 24.1 percent of employed residents 16 years and older working for manufacturing industries. Private wage and salary workers account for 83.1 percent of the work force. The racial composition of the community is 80.8 percent White, 15.2 percent Hispanic or Latino, 1.3 percent Black or African-American, 1.1 percent Asian, 0.4 percent American Indian and Alaska Native, and 0.1 percent Native Hawaiian and Other Pacific Islander. For populations five years and over, English is the only spoken language in 86.5 percent of the homes, with 5 percent of residents who described themselves as speaking English less than very well. Educational attainment for residents 25 years and over includes 11.5 percent did not graduate from high school, 32.8 percent high school graduate (includes equivalency), 39.3 percent with some college or an
associate degree, and 16.5 percent with a bachelor’s degree or higher. More than 58 percent of residents have lived in the same home since 1995.

Deer Park is described in a city fact sheet as being situated “in the industrial section of Central Harris County. It offers pleasant residential surroundings in close proximity to several of the major Houston Ship Channel industries, which employ approximately one-half of Deer Park’s residence labor force” (City of Deer Park, 2004, para. three).

Deer Park is dominated by one street and one highway. Highway 288 literally and intentionally separates the residential and small business area of the city from the major manufacturing, transportation, and storage facilities. There are no small businesses or private residences on the north side of Highway 288, with industry facilities that bank the south side of the Houston ship channel. Center Street heading south away from the chemical facilities and starting at the public entrance to Shell Deer Park refinery is the major thoroughfare through the city. Heading south on Clinton Drive with the plants in the background, residents, workers and other travelers are surrounded by small businesses catering to plant workers and local residents on both sides of the street.

The Deer Park CAER Team was established in 1986 in a joint effort between industry and the City of Deer Park as part of the requirements of the Community Right to Know Act. The Deer Park LEPC meets once a month and maintains an annual budget of approximately $100,000. Industry incidents are reported to the Deer Park LEPC, the police and fire departments, and the emergency operations center. Notification is required when there is “any incident of smoke of more than five minutes duration, any unusual odor that might extend outside the facility boundaries, or any unusual noise
which could possibly be heard outside the facility boundaries should be reported to the Deer Park police dispatchers immediately, and to the CAER Line as soon as possible, generally within 15 minutes” (Deer Park LEPC, 2004). Deer Park emergency communication systems, operated by and overseen by the Deer Park LEPC, include:

a) Outside alarm system – activated by a police dispatcher when a Level III release (an industrial incident is in progress at a facility that will affect outside areas) is reported. Activation takes approximately 15 seconds. This system includes eight siren-type alarms mounted on utility poles and can be heard throughout the city or can be targeted to specific regions of the city that are directly affected by chemical emergencies.

b) AM radio station 830 – also activated by a police dispatcher when a Level III release is reported, with an activation time of approximately five seconds, a generic emergency message is provided. A member of the city’s emergency operation center takes over message input within 15 minutes of the initial announcement.

c) Automated Telephone Notification Network (CAN) system – a computerized calling system that automatically dials community residents’ phone numbers that are listed in the local city directory and provides information about the chemical manufacturing incident. Activated with a Level III release, the system can begin calling within five minutes of a release notification. The system works on a grid or zones of the community, with community areas most directly affected by the release called first, progressing throughout the city.

d) First Alert – an emergency notification system is located in the school administration building, as well as all schools and public buildings, delivering emergency messages, with an activation time of one minute.

e) CAER Line – a phone number that residents can call to find continuous information about an emergency incident; activation time is typically 15-20 minutes.

A variety of risk communication tools have also been developed and/or utilized by the Deer Park LEPC. These include a speaker’s bureau, resource library at the Deer Park Public Library, an annual household hazardous materials collection day, school book covers and grocery bags with emergency SIP (SIP) information, the Deer Park
LEPC emergency information video, Web site, cable television notices, an annual calendar distributed to residents and businesses with SIP and other appropriate risk management information, and the ongoing Wally Wise Guy campaign.  

The Wally Wise Guy risk communication campaign was developed by Ford Advertising and Public Relations for the LEPCs of Lake County, Ohio; Pasadena, Texas; La Porte, Texas; and Deer Park, Texas. As the leading LEPCs in the development of Wally Wise, other community LEPCs can purchase the right to use the campaign in their communities for $295, and more than 110 communities across the United States have purchased such rights. The Wally Wise Guy campaign utilizes a turtle character to inform children, and indirectly other community residents, about SIP procedures during an emergency incident. Wally asks residents to SIP: go/stay inside homes or businesses, turn off air conditioning/heating systems, stay off the phone, and stay tuned to the emergency radio station for more information. Public relations tools used as part of the ongoing campaigns include the Wally costume for community events such as parades and fairs, press releases, comic strip, “Be Wally Wise” stickers, coloring books, school rulers, television public service announcements, school book covers, leaflets, media kits, refrigerator magnets, telephone stickers, and posters. Deer Park’s LEPC campaign won the 2003 Chemical Education Foundation 2nd place national award for LEPC achievements. The Institute for the Study of Issues Management has also evaluated the effectiveness of Deer Park LEPC’s risk communication efforts for the past ten years.  

Deer Park’s Story: One Day of Risk  

A tugboat captain, just finishing up plowing through the early morning, mucky, pewter-colored waters of the Houston Ship Channel, says that there is nothing more
powerful than guiding cargo ships full of raw materials through the channels and shipping canals that meander through one of the largest concentration of chemical plants in the world. "It's a job, my job, was my uncle's job," he says. Resolute and unwavering without antagonism or demand, he emphasizes that despite it being just a job there is a larger importance to his work – the work "being done around here," and the importance of the industry to Houston and the rest of the world. "We need this stuff [oil]. We're going to war over this stuff. It may not be pleasant at times, but it's all we got."

"J," as the captain refers to himself, says he has been working on and along the Houston Ship Channel for almost 20 years. Before that, he has had a variety of jobs throughout the area, but finally settled down in Deer Park when he needed some regular work, "some good work." He acknowledges that the hours are long and dirty but the pay is good. He adds that there is something remarkable about how the plants look in the morning and evening, especially during clear and calm weather. According to J, they can be "loud and stuff, all the loading and unloading and commotion," but at the same time, however, he says that when you step back, "there is an unexpected presence out there; with all the lights and exhaust from the stacks... it can look like Christmas decorations on your neighbors trees and homes."

"That's exactly how it looks," responds a young woman, stopping to pick up some kolaches on her way to the local community college, where she works as an administrative assistant. She happily though hurriedly shares that when she was a little kid she always thought it was cool that the plants did not take down their supposed Christmas lights. "I always wanted to leave my lights up at our house... just like the
plants.” She leaves mumbling something about how that might be the reason she uses a few strands of Christmas lights in her apartment throughout the year for decoration.

And there is something about how all the chemical, storage, and transportation facilities look, especially the plants. They stand like towering, intertwined pipes, making a city-like fortress of miles of metal, pipes, catwalks, and ladders, all illuminated by lights reflecting and highlighted by exhaust and smoke from the catalytic cracking furnaces, steam superheaters, and cooling stations. These towering facilities are surrounded by massive warehouses, piles of raw materials, railroad tracks, and massive domed storage tanks – all of it coursing with the raw and refined chemicals, such as oil, gas, benzyl, propane, benzene, kerosene, chlorine, styrene, hydrochloric acid, and a large variety of polymers.

Most notable, however, are the up to 200 foot high funnels shooting at times up to 20 foot long flares into the sky. Visible from miles away as you enter Deer Park, depending on the weather, it is surprising how loud they can be standing across from some of the plants that lie beyond a simple metal fence on the westbound feeder lanes of Highway 225. However, on this morning, like many mornings in Deer Park, the sky looks like a splotchy canvas of stained concrete.

Despite the activities surrounding the plants, mornings in Deer Park are relatively quiet and peaceful. There is almost no talk of the plants, nor mention of health, safety, or environmental effects related to intimately living near chemical manufacturing facilities. As residents and plant workers come and go from rushed morning breakfasts, with a large number of men and women wearing colored coveralls with identifying company logos and names that are noticeable throughout the city, one knows who others work for in the
industry without a word. Morning conversations around popular morning breakfast restaurants that dole out donuts, kolaches, and Mexican breakfast tacos include your typical fare for a small, southern city on the edge of the fourth largest city in the United States. Topics range from children, teachers, and schools to plans for the weekend; what needs to done around the house and going down to Home Depot and getting some supplies to do some fixin’ to barbecuing with friends and watching college football on Saturdays. Sports are a big topic, ranging from local football to the newest National Football League franchise the Houston Texans. Quite a few residents sport the new team’s jersey on weekends in the fall.

The conversations of daily life in this small town ignore one basic component: the air stinks. Nobody is talking about the very evident and pervasive odor in the air. The palpable odor is typically associated with the refining of hydrogen sulfide (H2S), which is a flammable, colorless gas that smells like rotten eggs, but different units with different stages of processing have different odors. This is true for a refinery and a chemical plant. Not necessarily noticeable inside getting pastries in the cool, air-conditioned donut-kolache shop located four blocks from Shell Deer Park, one is immediately met with the foul air walking out the door. Just rolling down the window to get a morning coffee at a fast-food restaurant’s drive through window can be at times shocking to the olfactory system. Yet few people seem to naturally talk about it unless it is brought up, and the only people who appear bothered by the smell are outsiders or those who do not regularly work in the city.

The conversation of plants’ odors does come up, however, at one of the numerous day spas and beauty salons that are located along a ten-block spread of Center Street.
According to a receptionist, women and some men come to our salon from all over the area, even from as far away as south Texas. “Deer Park has some of the best beauty salons in Houston… the air may smell at times but we have the best kept women in town.”

Sharing stories about what it is like to live in Deer Park, the conversation turns to the peculiar odor in the air. “Well, that’s the smell of money, honey,” one woman giggles, politely separating herself from her beautician to gauge the group’s response. “You get used to it after a while” and “it’s not really so bad” are common refrains from the group. No one in the group knows exactly what is in the air that causes the odor and they do not really think about it frequently. “Every place has its own little quirks, and we have ours. The plants here are a part of the city; this place wouldn’t be here without them.”

Another woman, lecturing as one can to an outsider who is curious about their city, suggests this is the way Deer Park has always been. “Deer Park is like a diamond with a few imperfections,” she explains. “This is a great place to live, a wonderful town, but if you look too closely you can start to see some of the imperfections… yes, we have odor, and all the plants, but that makes us unique… I wouldn’t live anywhere else.”

The owner of the beauty salon, Becky, has been listening to this and many other conversations about what it is like to live in Deer Park the past month. Becky recounts an incident within the past few years at the local Shell Chemical plant, the largest manufacturing facility in Deer Park. “I just remember the sirens going off, and realizing this was not the time for tests, and wondering what was going on. It wasn’t like we were scared here, you just want to know what’s happening and if you’re safe.” Others
remembered the incident, though could not recall exact details of the problem, how long
the city was on alert, or what eventually was the cause of the commotion. “We ought to
know,” Becky says, looking at her group of customers. “I’m sure they [Shell] told the
city, and it was in the papers, but you never really know what exactly happens.”

The biggest recent intrusion as a result of living in such proximity to a large
number of chemical plants was when the two of the nearby highways, including the main
toll bridge over the ship channel, were closed for several hours following a chemical
release at the local Shell Deer Park facility. “I had to drive all the way down to the tunnel
to cross the river; I hate when that happens, or when one of those large trucks coming and
going from the plants has an accident, things get all backed up, you might as well take
out a book and read you can’t go nowhere.”

In general, when asked about what the chemical plant’s produce, what is being
transported in the communities, or what is being stored in the domed tanks, their
responses are consistent and similar: oil, gas, and the stuff that makes plastic. No one is
able to provide additional insight regarding the materials being produced at facilities less
than a mile away.

The elder woman of the group, listening patiently until the end of the at times
frantic conversation, suggests that this is just the way of life here in Deer Park. “We
don’t think about these things too much. You can’t or you could just drive yourself
crazy. It’s the bad that comes with all the good in our community.”

Becky, who appears to be as gracious and open to strangers and customers as she
is with her children who often stop by after school, brings this conversation to a close,
with several of her clients’ appointments already falling behind schedule. Moving back
to her private office, Becky shares a concern that underlies her joy with living in this
town. She says that like most of the men and women who come into her salon she really
does not like to talk too much about all this stuff unless there is a plant explosion or
someone gets hurt at the plant. “Otherwise, you just cannot worry about everything…”
Deer Pak is a nice, safe town, great school and great people.” She explains how she does
not have to lock her doors when she leaves her house, but that she does have to lock up
the salon – lots of expensive equipment and not all of it is hers. “Maybe we should think
about what goes on at the plants more, but we don’t. My husband and I just love living
here,” adding, however, that she knows that her kids would rather live in Clear Lake or
Houston.

When brought up, however, the odor in the air goes hand in hand with pollution.
“I don’t think it’s getting any better, I think it’s going to get worse before it gets better, I
worry about when I go outside what my kids are going to be [breathing]. Is it really ever
going to get any better?”

Having lunch later that day with a group of retired men, none who have worked
directly for one of the chemical plants, they appeared eager to share their “war stories”
about living in Deer Park. For the most part all the men enjoy living in Deer Park
because it is safe, everything is close, the prices are right, and they all own their homes.
According to Jim, the clear leader of this group who organized this lunch, they all bought
their homes before the prices started soaring. He says that he never could have afforded
to live here if he had not bought his home more than 30 years ago, which seems to be the
group’s consensus.
Jim recounts how that over the years he has seen many of his friends die of cancer and other respiratory illnesses. Not willing to directly lay blame on the chemical plants, Jim also does not trust the industry. "I realize the plants are necessary," he says, adding that all their retirements are indirectly tied into the plants being successful. "But, I wish I knew exactly what was going on over there [pointing across Highway 225 toward all the plants]. Mark, the only other person at the table willing to share critical thoughts about living here, is more direct. "They lie to us all the time... what's in the air and water?" Mark adds that they try to tell the community what is going on, there is always stuff in the paper and on the radio, but insists it is "always only part of the story."

Some of the other men at the table, however, suggest it is not that way, that it is much more complicated than that. They talk about all the red tape and requirements of the plants. Charlie, who worked for the local government for a while, argues that the city gets lots of information about what's going on around there. "They [industry] have to report to the city, and especially to the fire department, in case of an emergency... They [city] probably don't tell us everything, but no one can, I don't tell you guys everything."

Charlie also suggests that most of the residents of Deer Park do not want to really think about or know what is going on. "People who live here, and who live in some of the surrounding areas, know how good we have it here in Deer Park... This is a great quality of life... I never expected to live and retire so well."

They all agreed that most of the folks who work at the plant care about the city and the people who live around the city, but more and more people who live outside of Deer Park manage the plants. Jim recounts how he received most of his information about what was going on at the plants from an old neighbor who worked for one of the
chemical companies. But since Jim’s friend retired and moved away, he has not kept up as much with what is going on. “I have enough of my own health problems to worry about.”

Like Jim, Sarah lived and worked in Deer Park for more than 10 years. Sarah is an apartment complex property manager and can see the plants from the front door of her office. Sarah says she is “comfortable living here because her kids are comfortable because of the schools.” For her, Deer Park is “small, not as big, schools, the people… everybody knows everybody, it’s a small little town.”

Sarah “does not give a whole lot of thought” to living next to the chemical plants. “My mom’s an operator at a chemical plant, my brother works at a plant, everybody works at a plant around here, and it’s always like cancer this and cancer that, but I’m not a worrier, but there are things, everybody saying you’re going to have cancer and no telling what’s all in the air, but unless you want to move somewhere down in the valley away from all this, you’re going to die somehow, someway, something.” Sarah continues that she does not think much about the risks. “I’m sure long-term, after years and years, some people have gotten sick and they’re blaming it on the air, but right now, no, at this point in my life no [she does not think about the risks of living near the chemical plants].”

Relatively unconcerned about long-term health issues, Sarah also is not worried about short-term health and safety issues, such as plant explosions, nor what to do if something should happen. Asked about a variety of procedures and precautions people can take during an emergency, she was initially unable to recall and was unaware of any of the communication tools used to inform people about what to do during an emergency except for Wally Wise Guy. “He’s [Wally Wise] the one who talks about the chemicals
in case of an emergency. According to Sarah, Wally wants "us to stay put, I guess, in whatever location you are in," the basic element of SIP though she does not know what SIP is or what the term means.

After thinking about it more, however, she recounts how she gets the Deer Park calendars. "There is always a little note, they give you that little magnet, they do advertising, the city does and puts out little memos, and I don't pay a whole lot of attention to them... I'm just too busy, with stuff that's probably not even important but."

Another woman who works at the apartment complex wants to share her thoughts about living in Deer Park. Melissa, who graduated from the local high school three years ago, has chosen to remain here. "I love living here... it's a small town growing, everyone knows everybody, I love it, everything is right here... it's weird but I love driving down Clinton Drive and you see all these people, all my friends there, all my school friends, I mean everyone that I've grown up with... I moved away once for a year and I had to [voluntarily] come back."

Melissa appears familiar with the city, where to go and what to do, what restaurants are cool, and what's going on in the neighborhoods. What she does not know much about is the industry. When asked about the industries, she struggles with the idea, finally understanding that this discussion is about the "plants, well there's Shell, there's Shell, there's um, there's a lot on 225, I can't remember the names but they are right there on 225 [pointing towards the plants], I know where they're at, one starts with a 'c.'"

Though Melissa does not think about the industry, she does think about safety. "I mostly think about the safety stuff, and like the explosions, and ever since 9/11 target wise, it may sound corny but that's what I really think about, and a couple of times there
has been a couple of accidents, not exactly right here, little explosions that shouldn’t have 
 happened and people getting hurt and fired, I have a resident, he is a firefighter at Exxon 
 and there was a fire when we first met and one of his friends had gotten hurt, caught on 
 fire, and we ended up having to attend a funeral for him.”

Surprisingly, there is little conversation about terrorism concerns, despite the 
 media bombardment. Similar to the odor in the air, little natural discourse evolves 
 around concerns for health and safety related to a terrorism attack. Melissa is similar to 
 others regarding this subject: a proud, strong bravado that this city is prepared. “I know 
 for sure that the plants are ready [for a terrorist attack]” and “they [terrorists] have 
 probably tried already [to blow up a plant] and we just don’t know about it” are common 
 refrains from local residents.

In some respects, there is a “we-have-been-through-the-wars” mentality when it 
 comes to terrorist attacks in their city. “I know we are a prime target,” one man 
 acknowledged, “and I just read about it the other day, but we deal with this kind of stuff 
 every day, we are better prepared than most places.”

Like many other residents, Melissa also thinks a lot about all the trucks, related to 
 the plants, which drive through the area, especially along Highway 225. “They [trucks] 
 are always on the freeway, driving, you hear a lot about accidents… and the wrecks, the 
 18-wheelers on the freeway dropping their loads, stuff like that, it always worries me 
 because my mom has to drive so far every day, and I am thinking ‘oh my God.’”

Despite these concerns and issues, Melissa reflects on her high school days and 
 how living in Deer Park is considered somewhat extravagant, as opposed to living in 
 other communities along the Houston Ship Channel. “Yeah, you don’t want to live in
Stinkadena (nickname for Pasadena, Texas),” also citing Galena Park and La Porte as two other cities that fail to compare to the “upscale” Deer Park. “Everybody knows that Deer Park is the nicest place to live around here. We used to make fun of people from other places, maybe in the same way that folks in Houston might make fun of us for living here.”

This theme, that Deer Park is in someway the Palm Beach of the Houston Ship Channel, was clear during high school football games in the fall. Though all the focus was on football, friends, family and the community on these Friday nights in town, some residents were glad to share why they lived in Deer Park and how much better their children and schools are compared to other Houston Ship Channel cities, including Houston.

The schools here are great, great teachers, plenty of resources, we have lots of computers, the community is really involved; typical of comments shared while parents watched their children, the games, and all the events surrounding the field. “My kids love going to school here, all their friends are here,” one parent shares, while another explains how she tried to get her daughter to go to a prestigious private school in Houston but failed to convince her daughter. “Going to Deer Park High School is like going to a private school in Houston.”

Other afternoon and evening events draw community residents together, from group and educational activities at the local community centers for everyone ranging from children to senior citizens to fairs and fundraisers celebrating the town’s history, the country’s history, other holidays, and the fire department. One local fair, celebrating, honoring, and raising funds for the local fire department, drew a large crowd of residents
and supporters of the fire department. Wally Wise was passing out information to the children. The LEPC, along with the city and emergency personnel, operated an information table providing Wally Wise Guy magnets and other promotional materials, information on SIP and hazardous waste recycling efforts, hurricane preparedness information, among other community safety brochures.

Though the event itself was operated by those directly and indirectly related to emergency management, there is little conversation about the industry, health and safety concerns, environmental impact of the plants, other than those generated by Wally and the information table. The focus is on barbecue, thanking everyone, raising money, and enjoying the weather on this beautiful, relatively clear sky, late afternoon.

But once again, with the topic raised, people were glad to share their opinions and stories. After Wally Wise passed out some information to a table of local residents enjoying the five-dollar barbecue plates, they began talking about what to do during an emergency to a newcomer to the community. “It’s not something that you really have to worry about, at least not on a regular basis,” one father said while encouraging his son to finish his plate. “They have lots of alarms and sirens that go off all the time... we all share what to do when something really happens.”

Another father mentions that all you have to do is grab your family and stay in the house for a while. If the problem is real bad, he continues, “Just grab your family and dog and head to the city [Houston].” Others chime in that it has never been so bad here that we had to evacuate family because of a plant explosion, but they all mentioned that they were prepared in case something should happen. “I keep a wireless radio around,
some water, and maybe a little better track of where my kids and wife are,” one father says.

All agree, however, that they have seen Wally Wise around a lot lately. They also agree that the industry provides information about what to do during an emergency, and several recall seeing advertisements, shopping bags, and the LEPC calendar, even if they do not exactly recall the exact SIP protocols. “I think you’re supposed to stay inside and watch TV,” and “don’t forget your pets” happily shouts a passerby. But when pressed about specifics, such as what is the emergency radio station frequency, other aspects of SIP, and when is it OK to evacuate, they became muted for the first time during this discussion. “It does not matter,” says one parent, it’s “common sense, you know what to do when you have to do something.”

“I worry about that big Shell plant at the end of Center Drive,” one mother says after finishing her meal, describing how the plant is right outside their back door. “I can hear the fire [flare].” She shares how she would like to air the house out regularly, remembering how it was like when she was little to have the fresh air in the house sleeping at night, but that she cannot do that because the house would smell like the outside. But mostly, she says, “I worry about if something should happen at Shell, then the other plants will go off like dominoes.”

One common complaint, which all the residents who are enjoying themselves at this fair agree upon, is that they believe the companies are more likely to release hazardous materials at night and when the weather is bad. “I can hear the flares burning in the night but not in the day,” one resident recalls. “I think they dump stuff at night when everybody is sleeping” or “when it’s raining and not as noticeable.”
A man who has been quiet this entire conversation joins in, saying he likes the companies and the jobs and that this "fine little city" would not be here without all those "big companies." But at the same time, he reflects, "I don't trust 'em" regarding dumping hazardous materials into the air at night. He shares how he has lived in the city a "long time" and thinks that things [environment] have gotten better in the past ten years. But not at night: "I think they save all their stuff up and send it off at night."

(Many/most facilities operate on a continuous processing basis, which means they cannot tolerate "spiked" releases without causing problems that are operationally disruptive and expensive. The wastewater treatment systems are based on regular quantities of water. Overloading the systems with more materials can harm the "bugs" that are critical to treating the water).

But if somehow sensing that they are leaving a stranger with the wrong impression of the city, they recite a litany of things the chemical companies do that help the community. "I don't think they could have this here barbecue without them," one resident says. "You think they make much off of five dollars a plate." According to them, most of the money raised today will come from the plants.

What else do the plants do for the community? Jobs, they say, and great schools, and nice homes. "And I think they care about us... most of them [plant workers] live around here anyway... they have to care because they would only be hurting themselves." As another resident walks away from the table, she adds one more thought as the discussion wraps up and folks grab their children. "They [industry] put out lots of stuff [information about what to do during an emergency]... we're just not worried about it."
Later in the day during a city holiday festival (Halloween), a group of parents share their knowledge of what to do during a chemical emergency. "They tell us all the time, the companies and the people who work for the city, how can you not know what to do." Asked to provide some details for a newcomer, parents share strategies, almost interrupting each other as in an effort to impress a teacher. "Most importantly, you want to SIP," which leads to a series of nods and agreements from those around the table. "It's all common sense, you want to get inside, wherever you are, and do everything you can to not breathe outside air."

Beyond the basics, however, few of these parents are able to provide more detailed emergency response information. Several share how the schools and businesses in town have their own emergency alert systems, they all cite Wally Wise sharing information to their children, and they all have mentioned the siren system in town. "At first it can scare you, I had no idea what that was the first time I heard it. But now I don't even pay attention to it unless the sound is different; then I know something is wrong."

"You can get information about problems from so many places, so no one can tell you that it isn’t out there," argues one parent. They list the television news, the emergency radio station, and the sirens as sources for quick emergency information. "You really have to pay attention to hear the city loudspeakers," one mother adds, while her husband notes that if you are down by the plants you can just listen to their loudspeaker system – "that’s getting it from the horse’s mouth."

As this discussion continues, folks rotate to and from the table, as some parents run after their children while other residents leave to clear plates and space for new arrivals with a plate full of holiday goodies. "I think everyone here does a great job of
looking after each other... people are so nice, and I hear folks complaining about this or that of the plants, but they take care of us, they really do... I've lived in a lot of towns around here [Houston Ship Channel] and this is the best by far, now they could do more, but they already do a lot." This quick expression of industry support is echoed by others at the table. "I use to live in Pasadena, but it never felt like home, this place feels like home, I know there are problems but we are taking care of them, and if you think about it, there are a lot less problems here than say in Houston, you couldn't pay me to live in Houston."

Though many of the residents share that they are not "really worried about it [health and safety]," many are quick to share stories about iconic plant incidents that have happened in the area and along the ship channel. Two stories from the past, one more than half a century ago, come up often in group discussions: the Texas City disaster of April 16, 1947, and several Amoco plant incidents in Pasadena, Texas.

Comments such as "we're not Texas City" and "we're not Stinkadena" came up several times during discussions of plant safety. The Philips plant in nearby Pasadena has had several high profile incidents during the past two decades. On October 23, 1989, an explosion at the Phillips petrochemical plant killed 23 workers, injured more than 130 personnel, and caused physical damage in excess of $1 billion. The explosion, where approximately 1,150 workers operate on a 640-acre complex, was felt 25 miles away, caused fire and heavy black smoke, and showered debris for miles around (Warren, 1989). The second explosion occurred March 27, 2000, which left one employee dead and 69 workers injured at the plant. The employee killed had worked for Phillips for 19 years and survived the 1989 explosion. Injuries included burns, cuts from flying
fragments of debris, and wounds from falls (Rendon, Bryant, Hopper & Antosh, 2000, p. A1).

The Phillips incidents are talked about in the sense of something can happen now and this close to home. Though Philips is not the only company to have explosions and other incidents, the 1989 explosion is often recalled when sharing stories about living in the area. “I remember when Philips went up” is a common introduction to residents sharing old stories about plant explosions. Smaller-scale incidents, such as plant leaks or limited explosions, some that have even led to death(s), are rarely mentioned in the annals of the community history.

And the Texas City explosion is probably the most frequently historical plant explosion talked about in the community, though primarily by the older generations who were around to experience it or at least had parents and grandparents who have shared their personal experiences. The “Texas City disaster,” as it is frequently referred to, tops all other major industrial incidents in the United States as far as loss of life, property, and injuries. Though the exact count was never determined, it is estimated that more than 600 people were killed and more than 5,000 injured. The homeless was estimated at 2,000 residents, with businesses, defense plants, refineries, homes, churches, planes, cars, trains, ships, and the local port destroyed. Most of the city was destroyed, including the entire fire department. The S.S. Grandcamp, a seven-ton freighter filled with several thousand tons of ammonium nitrate, ignited in the port, which sent off a chain reaction of explosions of nearby chemical plants and other manufacturing, storage and transportation facilities (Minutaglio, 2003).
"I remember my parents telling me about the Texas City explosion. We apparently had family who worked for one of the local plants, who died in the explosion," one resident shares while telling her own history of living near chemical facilities. "It's always on the back of my mind, especially when something happens here or nearby... you don't think about it on a daily basis, it would drive me crazy, but you think about it when you hear that something has happened somewhere else around here, just like Exxon a few months ago over in Baytown. It worries me but I just keep on staying."

Another resident shares similar concerns. "I just hope we don't have another Texas City here, especially with us being so close to the plants and railroad." Relaxing in her rocking chair, looking in the direction of the plants and gesturing toward them, Betty talks about growing up in Deer Park, leaving for a while, but coming back after getting married. "We [her husband] always wanted to live in a small town, and there were jobs, and we liked it here as kids, so we thought our kids would like it too... but they left as fast as they could... good for them... but we like it."

Betty mentions that her husband still goes down to the plants everyone once in a while to see friends, or goes to lunch or plays golf with some of their old friends. "We don't talk too much about the plants, unless someone we know gets sick or hurt [from working at the plant], like cancer... but even then, you don't, don't want to think about that." As a cloudy, rainy evening develops, it is hard to argue with those who think that the plants are more likely to release materials into the air when no one is around, covered over by inclement weather.
Community Context of Galena Park, Texas

Galena Park is also situated in a highly industrialized manufacturing area near the Houston Ship Channel in eastern Harris County. The site, originally called Clinton (after a brief period where the land was owned by a private family who received the land as part of a grant from Mexico), developed into a farming and ranching community until 1876, when the port of Houston was developed. Local resident Charles Morgan, owner of the Morgan Steam Ship Company, dredged Buffalo Bayou and excavated a canal to open a channel for the port, as well as constructing a railroad from Houston. By the early 1880s cotton was the dominant industry, and Clinton prospered as a railroad and shipping center (Galena Park, Texas, 2003).

In the early 1900s the petroleum industry developed and the first refinery was built by the Galena Signal Oil Company of Texas (later bought out by Texaco). Another important early industry in Clinton included the United States Steel Company in 1927. In 1935 Clinton changed its name to Galena Park, in honor of the oil company. In 1936 the town had 300 residents and twelve businesses. Beginning in the late 1930s, with the development of Houston as a major port, Galena Park grew until the mid-1970s, when the town reported a peak population of 12,645. Afterward, however, residents declined to 9,957 in 1988, including 101 businesses (Galena Park, Texas, 2003).

At present, Galena Park, as part of the north channel outreach area, has 44 EPA-regulated facilities, including 14 major manufacturing, storage, and transportation facilities, including American Plant Food Corp., Bauwerk AG Export Waste Management, Chevron USA, Dynergy Midstream Services Galena Park Terminal, Equilon Enterprises L.L.C., Kinder Morgan Liquid Terminals L.L.C., Martin Marietta
Materials, National Oilwell, Paktank Corp. Galena Park Terminal, Port of Houston Authority, Shell Oil Products U.S., Texmark Chemicals Inc., U.S. Gypsum Co., and Williams Terminals Holdings L.L.C. According to TRI reports (July 25, 2003), the latest list of on-site and off-site reported releases included materials ranging from benzene to xylene to ethylene, from eight manufacturing facilities including: Chevron Products, Co., Dynergy Midstream Services, National Oilwell, TexMark Chemicals Inc. and U.S. Gypsum. Within the past two years, five of these facilities have been in violation but not in significant violation, and no facilities are currently designated as a high priority violator under the Clean Air Act or are in significant noncompliance under the Clean Water Act or the Resource Conservation and Recovery Act.

TRI data from these facilities include 45 thousand pounds of fugitive air releases. Stack air emission accounted for 43,000 pounds of release. Total on-site releases from Galena Park facilities accounted for 89,000 pounds of releases, and the total off-site releases accounted for 1,800 pounds of releases.

According to the U.S. Census Bureau (2000), Galena Park presently has 10,592 residents, with females making up 50.2 percent of the total population. The median age of a resident is 28 years, the median household income is $31,660, and 19.2 percent of employed residents 16 years and older are employed in the manufacturing industries. Private wage and salary workers account for 82.4 percent of the work force. The racial composition of the community is 69.3 percent Hispanic or Latino, 22.2 percent White, 7.6 percent Black or African-American, 0.4 percent Asian, and 0.6 percent American Indian and Alaska Native. For populations five years and over, English is the only spoken language in 35.9 percent of the homes, with 31.3 percent of residents who
described themselves as speaking English less than very well. Almost two-thirds (63.6 percent) of the residents speak Spanish. Educational attainment for residents 25 years and over include: 51.5 percent did not graduate from high school, 25.5 percent high school graduate (includes equivalency), 16.1 percent with some college or an associate degree and 7 percent with a bachelor’s degree or higher. More than 60 percent of residents have lived in the same home since 1995.

Galena Park is dominated by Clinton Drive, which cuts through and almost separates the residential and small business area of the city from the major manufacturing, transportation, and storage facilities. Heading east on Clinton Drive away from the city of Houston in the background, residents, workers and other travelers are surrounded by small businesses catering to plant workers, and local residents on the left, while on the right, except for a small scattering of homes and apartments are industry facilities that bank the north side of the Houston ship channel.

The Galena Park CAER Team was established in the late 1980s in a joint effort between industry and the City of Galena Park as part of the requirements of the Community Right to Know Act. The Galena Park LEPC meets once every other month and maintains an annual budget of approximately $30,000.

Emergency notification systems and protocols are essentially the same in Galena Park as Deer Park, recently adding the siren system that covers the entire community. A variety of risk communication tools, though to a much lesser extent than the Deer Park LEPC, are used by the Galena Park LEPC. These include a few elements of the Wally Wise Guy campaign, including character and refrigerator magnets, a poster contest, local LEPC calendar and handouts. LEPC representatives also make numerous presentations
throughout the year to schools, local businesses, and community centers. Most of their print handouts are in English and Spanish. The Galena Park LEPC does not utilize a public relations agency for the development or implementation of its communication efforts and does not conduct an evaluation of its communication efforts.

Galena Park's Story: One Day of Risk

"Everybody that I know went out to watch the fire," recalls Juan, who has lived in Galena Park for more than 30 years. "Hell, we even brought the family – my mother and our kids – over toward Clinton Street." Juan suggests that the afternoon and evening had a festival atmosphere, with everyone in the neighborhood out and about. Trucks were all over the place, the back hatch down and coolers and chairs in the beds of the trucks. "Some of us brought beer while others brought food," he continues to explain, noting that there was not much time to prepare and the whole event just came together quickly.

"We were just watching the smoke and flames. It was across the river so I wasn't worried none," Juan's neighbor recalls, agreeing with Juan that everyone grabbed their families, chairs, food, and drinks and headed down toward the ship channel "for the best view." Some people even brought along their barbeques, Juan says. "All we needed was the marshmallows."

The informal festival and best view was for an explosion that occurred approximately two years ago at the Crown Petroleum company LPG facility, which lies directly across the ship channel from Galena Park and is the closest chemical plant in Pasadena. "In hindsight, maybe it was not the best thing to go out there, especially with the kids," reflects Juan's wife. She adds, however, that there were no sirens or any
warnings called in Galena Park and the police cars and fire trucks would pass by us and “nobody stopped to warn us, to tell us to go home, nothing.”

“That’s how use to all this smell and smoke, and all the other dangers of living next to the plants, that’s how use to this we are,” Juan’s wife adds. “I’m sorry, we shouldn’t make light of this but what else can you do... they leave us alone and we leave them alone.” Monique, her daughter, remembers the explosion. She was a senior in high school, and shares how stupid she and her friends were, because all they wanted to do was take the Washburn Tunnel across the ship channel. She says that they just wanted to get close to the plant. “It’s like a car crash, you can’t help but look.” But at the same time, Monique adds, she does not want something like that to happen here. “I worry about my parents living so close to the plants, now that I live in Austin (attending the University of Texas).

Many of the residents of Galena Park remember the explosion at the Crown plant. While Juan and his family and neighbors shared the festival-like atmosphere while they felt safe from the explosion, others reflect, like Monique, on that explosion as an indication that something similar could, and probably will happen, in Galena Park someday.

“There’s not much we can do about it,” says Maria, sitting with a group of young mothers, sans their children who are at school, at a local panderera. Maria and her friends all speak English and Spanish, and hesitantly admit that Spanish is the primary language spoken at home. At first a couple of Maria’s friends feigned poor English, but after the conversation developed, and after several of these breakfasts, their English language skills improved remarkably.
“It’s hard to talk about these things with you [strangers]... you never know who is listening,” Maria allows. “But like we’ve said there isn’t much anyone can do.” Their lack of control is in regard to the pollution and long-term health effects related to living near all the chemical plants. “We live right down the street from the gypsum plant (U.S. Gypsum) and the oil company (National Oilwell). We have no idea what they are doing over there [pointing towards the plants across from Clinton Drive], what they are making, and why everything is so dirty.”

Maria shares that this type of conversation is not typical for her friends. Her friends get together once or twice a week for breakfast when the kids are in school, and “we really don’t talk about the plants very much,” adding that they never talk about long-term health effects of living in Galena Park. “Unless something happens out here, I think we just kind of ignore it.”

One of Maria’s friends, who occasionally stops by these morning breakfasts, worries about the men and women who work at the plant. “We [Hispanics] have the worst jobs in the plants.” Maria acknowledges that she does not really know or understand what her husband and others do at the plant, but she knows how tired, dirty and exhausted they are all the time. “They work terrible hours, doing God knows what.” What really scares her is when she hears that someone who works at the plant was hurt or even killed. “It happens enough that someone should do something about it.” At the same time, she acknowledges that her husband and his friends like their jobs, or at least appreciate the work. “I guess it’s better than what they were doing before moving here,” with no further explanation.
Another of Maria’s friends, who usually is the first one to get extra panecitos, suggests that people “shouldn’t talk about such things in public,” but that does not mean they do not share their concerns privately at home. “Between us,” she quietly says as the others go up for more coffee, “my husband and I do talk about how all the pollution might hurt our kids. But I think they will be OK, they’re young, we [parents] are the ones who are going to stay here. She is hopeful that her kids will go to college somewhere else, maybe in Houston. This way they are close but not too close to Galena Park and all the pollution. A little uneasy at sharing these private moments, she quickly changes subject as her friends return to the table.

The conversation becomes animated. “I don’t trust one damn word they tell us, not one… I used to when I got here, but everything they say is not true, nothing has changed since we moved here… thank God the schools are good and it’s safe,” share a couple of Maria’s friends who are agitated by parts of the conversation. “I just don’t understand how the plants can say one thing – like they care about their workers and us – but at the same time pay them less than anyone else… doing some of the worst jobs there”

What she is referring to is the lower wages paid to relatively unskilled maintenance workers who are contracted out to small, local companies, as opposed to being hired directly by the larger chemical companies, whose employees have better wages and safety records, according to this breakfast group. “It does not matter if you work for them, for someone else who works for them, it’s all the same… all they care about is making money, they say they don’t [make money] but we all know they do.”
After this extended breakfast, an informal soccer match has quickly become a neighborhood gathering, which turns out to be a regular weekend, late morning event in the south side of Galena Park. Families gather, food is shared, and the gentle rhythm of the start of a relaxing weekend is in the air. By now a few people in this neighborhood are aware of the gringo asking questions about what it is like to live in Galena Park. Though some remain suspicious, the doors have been partially opened from recommendations from a few key neighbors and a couple of local priests.

“They’ll like you once they get to know you,” advises one of the priests, providing introductions and explanations. “It’s good that they talk about these things. This is a great community, and many parishioners are coming from less than ideal situations, some even dangerous... most of them don’t want to cause trouble... some of them don’t realize that you can talk about the companies or government without repercussions.”

As the soccer match and introductions continue, a few small pockets of conversation develop. “The worst thing is all the traffic,” one man exclaims. “They [truck drivers] don’t care how fast they are going down Clinton [Drive]... it’s like their own personal driveway.” The topic of traffic enjoins several more residents into the conversation. “First of all they go as fast as they want, and second, they are all carrying some pretty bad stuff as cargo.... I’m just waiting for a couple to collide and set off one of the terminals.”

“And that does not include all the diesel exhaust, debris all over the roads and businesses that line the Clinton Drive,” another resident adds. They have had community meetings about the traffic and truck problems, adds one resident who is standing just
outside the group, “but nothing is ever done about it… I go over the speed limit or have something hanging out the back of my truck; I get pulled over and harassed. But no one says anything about all these trucks, my business is right on Clinton and I have to constantly clean my parking lot and windows from all the junk they stir up.”

Later that morning and farther away from the main group of families having snacks with children running around playing, residents appear more willing to share their concerns about living in Galena Park. “We really just want to be left alone,” Rafael quietly shares, explaining how he loves to live in this country and in this city. “It’s safe and that’s the most important thing… plus I can support my family… and my kids are getting a great education… for free.”

Rafael explains that he has family who live in Houston – most notably his sister – and “it’s [Houston] not for me. “My sister is constantly worrying about her kids, are they safe, what kind of education they are getting, who they are hanging out with.” Rafael says that he does not have to worry about his kids and family that way. “They are safe here, it’s a small town like I grew up in Mexico, we all know each other… and take care of each other.”

The idea that Galena Park is a small, safe city where everybody knows each other is a constant theme that runs throughout conversations. “It’s funny,” one woman says, “but if these chemical plants weren’t around, and all the trucks and storage tanks – and smell – this would be a great town to live in.” Her friend laughs, chiding her for how silly that sounds. Elsie, who lives down the street and enjoys these soccer mornings, interrupts and questions how Galena Park could survive without the chemical companies. Without the plants, according to Elsie, Galena Park would have become another suburb
of Houston. She explains to everyone listening that on the other side of town, directly opposite of where Galena Park is located just off the inside loop 610, is really just another part of Houston. “If we didn’t have the trucks and smell and smoke, the plants… this city would be great,” another person repeats like Elsie’s neighbor, “but we wouldn’t be here, our homes would have been torn down a long time ago…. Your kids would be going to HISD [Houston Independent School District].”

The mention of Houston public schools changes the focus of the conversation. With a sense of pride, several note that the new state head of education in Texas is from Galena Park. Others rave about the quality of local teachers and all the amazing things their kids are learning. “I can’t even use a computer but my kid can… they have computers in all the classrooms,” one proud parent points out, questioning whether they have those things in all the public schools in Houston.

“I don’t care about all the pollution,” says another parent, listing problems in the city such as the smell, how hot and dusty it is in the summer, nor even the “beat-up look of the city.” All I care about is that my children are getting a good education. They can leave when they are 18 and go to college and never come back here.” Another father concurs: “They [his two kids] are young, they won’t get sick, and I don’t care if I get sick…. they never would have been able to get a good education if we would have stayed at home [assumed another country].” A couple of the parents who have been at the center of this discussion wrap things up, several of them wanting to get back to their families or chores of the day. “Some of our kids are going to go to college, that’s what’s important. They won’t have to work like their mother and me… they can live wherever they want after that.”
Later that afternoon, at the local and well-used community center, two groups of residents share their thoughts about living in the community, focusing on plant safety concerns and what to do during an emergency. The first group, comprised primarily of retired and other senior citizens, knows what to do during a chemical emergency. They have picked up information about SIP from both the community center and their assisted-living center. "Every once in a while they pass out some literature," says one man. "That means to stay where you are... or get inside if you are out... and most importantly keep informed, I think there is a radio station the center would turn to."

Members of the second group, comprised of men who have friends and family members who work at the plants, are not as aware of SIP procedures as the more elderly group at the other table. They overheard the discussion of what to do during an emergency, but several scoff at such notions. "I don't care what they say; I am getting out of here as fast as I can if something goes wrong on Clinton [Drive]." Another man echoes those sentiments. "The city passes out a lot of information about what to do during hurricanes and plant explosions, hopefully not at the same time, but that does not do us much good here."

Several of the men also agree with this sentiment, that the problem is not what to do during an emergency, but not knowing what occurs at the plants on a daily basis. "I know they make gasoline, chemicals, and plastics over there, but what goes into all that stuff... what about all the stuff they drive through the heart of town." Rather than providing information about what to do during an emergency, the group agrees, "The city and the plants should talk about what they are doing to improve our health."
“They’re not doing nothing about that [health],” Steve says, walking around the table getting slightly agitated by the conversation. Ever since 9/11, he argues, the plants have spent all their money that was going to pollution controls and long-term health concerns to plant security. “They put up new fences, and cameras all over the place, I don’t even like to walk around there.” Steve’s younger brother, getting up to join him in a mini-protest to this discussion, is not bothered by the increased plant security. “We need that, Houston is a possible terrorist attack... I feel better with the extra security... what pisses me off is that they were able to get all that done ASAP, but when you ask them to do something for the city, they are always ‘looking into it’ and nothing gets done.”

“I don’t even think they talk a good game,” says another man, slightly younger than the rest of the men in this group. He has lived here for more than two years and says he has yet to get any information from the city or plants about what to do during an emergency. “I have no idea what I am breathing here. Can you explain that to me?”

Things, however, are getting accomplished at the local junior high school. Parents, students, teachers, administrators, and a few community volunteers are spending the afternoon beautifying the school. Between picking up litter, planting flowers for spring, and cleaning various aspects of the buildings, as well as some internal decorating, this has become the perfect opportunity to ask about Wally Wise.

“We love Wally,” state several teachers volunteering their time this afternoon. They explain how the chemical companies provide all sorts of materials featuring Wally Wise to teach the kids what to do in a chemical emergency. “Wally is great... he’s cute... I just love it when he comes out to our games, he always roots for the home team.
but he is probably supposed to be neutral.” According to these teachers, the little kids really love Wally. “I think the younger kids even collect his trading cards... Deer Park may have Andy Petite (former Deer Park high school baseball standout, now a pitcher in Major League Baseball whose family still resides in Deer Park) but we have Wally.” Wally, apparently, is more than just for kids according to these teachers. “I think the parents really like Wally too, a lot of my parents know about SIP because their kids bring Wally stuff home to them, like the coloring contest... he puts a face on the plants...”

Asking about other ways the plants communicate encourages little additional discussion. One teacher mentions meetings at the city hall, while another points out a brochure but “that also has Wally too.” Reminded about the sirens system in the community immediately heightens the volume of the conversation. “They test that all the time... I don’t even pay attention to it anymore... I’m not even sure which are our sirens and what are the North Channel’s, and what about Pasadena’s?” All I know, responds one teacher, is that the schools are notified immediately, even before the community. “If you can say anything about living here, we take care of our children.”

The emphasis on taking care of family, and especially children, lies at the heart of this community, says Walter, who sells jewelry to adults and candy to children just in front of one of the small, Hispanic-dominated strip malls. Walter and Francisco, the owner of a body shop down the street, have been best friends for more than 30 years. They went to Galena Park High School together, both moved away, and both returned married with six children between them.

“What you and others like you don’t understand,” Francisco says, “is that we don’t trust anyone but ourselves and our family... oh yeah, and your best friend.” The
bond of a lifetime barely acknowledged, Walter concurs. “We take care of ourselves.” Walter talks about how over the years, every few years, one group or another has come to Galena Park about the environment, highways, streets, plants, and “whatever else can be meddled with.”

Laughing, they tell me that Green Peace does not even come here anymore. They all tried, “but no one asks us what we want… they all assume that they know everything but they don’t.” According to these friends, you have to live here to understand this community, to gain a sense of acceptance so you can understand the community’s wants and needs. And according to Walter, these are quite simple: jobs, safe and caring schools, and not to be bothered.

“We don’t bother no one here, no reason for those folks from the city [Houston] to come on down here and mess things up,” Francisco urges. For these two men, being left alone after a hard day of work is important, but more importantly leave their families alone. It comes down to trust, they both agree, and who can be trusted. Trust for them, however, is hard to come by. They trust the manufacturing companies in Galena Park more than they trust the local government, or state and federal agencies such as the EPA. “At least we have jobs because of them, I would like to work for them, but they at least keep the town going… plus all their property taxes pay for the schools and local sports and so on.” Asked what the city government does for them, they chuckle, “tickets [for speeding]… they just take away my money for this thing or that.”

They both dislike environmental activist groups, especially those from out of town. They admit to trusting a few local groups who “really care about this community because they live here” but other than that health and environmental activist groups
cannot be trusted. "I know people who have lost their job because of protests," says Walter, while Francisco adds that people have not only lost jobs, but more importantly, people often do not get new or better jobs because plants cannot expand or cannot move into the area for one reason or another. "Those folks should take care of their own place... not come down here and mess around."

Many residents stop by to say hello to these two men, and browse at the jewelry before entering the grocery store. On this day, very few residents can competently share what to do during a chemical emergency. No one has mentioned a radio station or other media outlet for information, though a few say they can hear the sirens at the plants. "The companies' loudspeakers are pretty clear if you are up close, but I have no idea about the other speakers in the city."

Discussions of personal actions residents can take in an emergency fail to yield detailed understanding of emergency response protocols. "Never heard of that [SIP]... never heard that mentioned anywhere around here," says one curious shopper. Her friend echoes her sentiments. "I have no idea what I would do. I guess I would take care of my family the best way that I know how... I'm not sure there is much you can do."

Walter, busy showing new products, often points to long-time residents who will probably have something to say. Consistently, when asked about SIP, Walter's friends and regular shoppers look confused, not sure exactly what it means. Asked about what they would do in an emergency, most rather nervously respond that it is not an issue for them. "It's like hurricanes where I used to live, if something happens you just got to get out of the way." Another shopper mentions that she has read some materials - from the companies or the city - about what to do during an emergency. "Get out of the outside,"
She succinctly points out, “until they let us know it’s safe to go back outside.” She does not worry about it that much because she prefers to stay inside anyway. “I have asthma, and most of the time it’s hard enough for me to breathe when I am home, sometimes I can’t even breathe outside, that’s when my husband has to do the shopping.”

As the late afternoon turns to evening, the town transforms itself into a large pod of isolated homes. The neighborhoods have become relatively quiet, and the local parks, community centers and school fields have said goodbye to their last guests of the day. All is relatively quiet except for Clinton Drive, which remains illuminated from all the plants and transportation centers. Industrial trucks continue to kick up dust and other debris into local businesses’ parking lots, and the roar of manufacturing is even more audible now that the rest of the town has gone home to rest.

The quiet evening, however, has provided an opportunity to attend a dinner party for couples who have recently moved into the area. Carolyn works for one of the chemical companies as a secretary, while her husband cuts hair at a local and privately owned barbershop. Bob, Carolyn’s husband, is not sure exactly why there is a stranger in his home, but appears comforted by his late-arriving friends. He explains that his barbershop is simple: “we cut hair and not a lot of chatting and other stuff goes on there.” If someone wants their hair colored or nails done, that is not his place. “A good, clean, sharp haircut.”

A comfortable level of small talk occupies most of the evening’s discussion. They talk about family and friends, the Iraq war and how brave the soldiers are, and though there is some general dissent about the purpose of the war they clearly do not like
the other side of this battle. After talking about and thinking about the war in Iraq, the conversation moves to how fortunate they all feel.

“For the most part, we have things pretty good here in Galena Park,” says Bob. “I know that a lot of people have no clue to why we moved here, but they don’t have to. Carolyn and I like living here so far.” As if on cue, several other guests offer plenty of reasons for Bob and Carolyn to remain in Galena Park. “We haven’t lived here that long and we know all of you already,” says Carolyn, who in an embarrassed manner shares how they didn’t know, and didn’t want to know, their neighbors where they previously lived.

Bob, joining his wife in the conversation, shares about how this is his first business, and that he could not have opened up his own barbershop where they came from, that just would not have been possible. Nobody at the table asks them where they are from, but it is clear that they are relatively new to the United States. They, along with their guests, sound appreciative to have jobs during this hard economy. And they acknowledge that despite the plants right down the street, they feel safe: “nobody is shooting at us here.... I just wish we could have had the dinner party outside,” says Carolyn.
CHAPTER FIVE
RESULTS, ANALYSIS, AND DISCUSSION

This study's strengths are the triangulation of data gathering methods and the unique benefits of living in both communities, day and night, sharing and experiencing first-hand to a limited degree the narratives and perspectives of community residents. These strengths, however, were also challenging when it came to analyzing, categorizing and explicating residents' stories and experiences.

The research questions were developed to focus analysis on community residents' risk perceptions related to living in a community with a high concentration of chemical manufacturing, transportation, and storage facilities, and comparing those perceptions and experiences shared via narratives to previously established risk communication variables, models, and theories. Community residents' risk perceptions were also compared to one federal and one industry program aimed at increasing knowledge about issues related to living near such facilities, and a comparison of a few key community findings.

Community Residents' Perceptions of Risk Roles

The roles that residents perform in communities can be identified as how they describe their positions via narratives and experiences residents share about living in communities at risk. This view of enactment is based on the principle, reasoned Burke (1965), that "a motive is not some fixed thing like a table, which one can go and look at. It is a term of interpretation, and being such it will naturally take its place within the
framework of our Weltanschauung as a whole" (p. 25). How people enact roles on behalf of and in response to each other and their work depends on the perspectives they hold. They enact their perspectives as though they were "dancing an attitude," the essence of symbolic action (Burke, 1973, p. 9).

For example, risk bearers can be residents who consider themselves, family members, friends and neighbors, and plant employees as bearing negative health and safety consequences related to living in communities with a heavy concentration of chemical manufacturing facilities. Residents bear risks because of the conditions in the location of the narrative. Palmlund (1992) identified risk bearers, along with five other types of players in risk narratives, at the meta-level of analysis (as described in detail in chapter 2). From this perspective, the following research question was posited:

RQ1: What risk roles do near neighbor community resident perceive themselves and others (individuals and organizations) in relationship to living in a community with a high concentration of chemical manufacturing, transportation, and storage facilities?

This research project demonstrates that residents in both communities position themselves in more highly-defined roles of bearing risk than previous social risk roles analysis have portrayed. The most frequently mentioned roles for individuals and organizations within these communities, as identified through narrative analysis of the various data collection techniques, includes powerless risk bearers, powerless-with-benefits risk bearers, future-generation risk bearers, powerless employee risk bearers, bravado risk bearers, community risk bearers, industry risk generators, industry management risk generators, risk generator accomplices, and risk bearer advocates.
Powerless Risk Bearers

This is the group most closely aligned with Palmlund’s (1992) original identification of risk bearers. These residents perceive their role in the community as powerless residents, facing and bearing health and safety risks due to living in proximity to major chemical manufacturing facilities without apparent economic or social benefits. “There is absolutely nothing we can do, come on… We’re as sick as can be… I can’t even get a job at one of the plants, any one, does not even have to be Exxon or Bayer” (GP-PI-11-12). Another resident who perceived herself, her family, and her friends and powerless risk bearers acknowledged a level of complete frustration with their living situation (GP-OP-23-2):

I don’t know how much more I can take. We moved here thinking this would be a good place to raise a family, my husband could get a good paying job, but they’re [jobs] not around anymore, you almost need two or three college degrees to get an interview at one of those plants… and I don’t want to get into how sick my kids are all the time… this town is a mess, we’re a mess, maybe it’s just me, I guess some people like living here.

Such residents from both communities, though to a much larger extent in Galena Park, shared stories of bearing risk without mentioning neither personal nor material benefits to living in the community. A majority of the African-American residents from Galena Park who discussed their stories shared this sentiment. Part of being a risk bearer for numerous African-American residents is that they perceive no economic or community benefits from living and working near the industry. As one African-American female resident stated, "We don't have any of us working in those places [chemical plants]. We don't know what's going on over there. Like I said, I've been here for 40 years, and I don't know what was going on over there" (GP-FG-6-8). One African-American male noted, "We are in an area where we've been invaded for years. It's not
something that's just come up, about the burning of the warehouses, that just made some people alert that we're sitting up here in a matchbox... and we don't even get to use the matches" (GP-FG-6-9).

That sense of powerlessness was not only an African-American perspective, as one Hispanic woman explained what she and her friends talk about in regard to health and safety concerns. “I guess the cancer, or if there’s an explosion. Or what if, and what? What are we gonna do? You’re in a situation where there’s not a whole lot you can do. Either stop complaining or move” (DP-PI-10-5).

Powerless-with-Benefits Risk Bearers

Some residents also perceive that they bear increased health and safety risks by living along the Houston Ship Channel. They consider themselves powerless to effect meaningful change in their own lives or in their community, but at the same time they derive benefits from having the chemical plants in the community. For these residents, the acceptance of being a powerless risk bearer is tied into some of the advantages gained from living in the community. These benefits include economic, such as property taxes to fund the local schools and jobs, and community, such as the safety of living in safe neighborhoods where you know your neighbors. In contrast to other neighborhoods where they have lived, in both Galena Park and Deer Park they enjoy a unique sense of tranquility they have not felt in previous large cities where they lived (especially mentioned Houston) – safety from crime, economic benefits, good schools, and friendly neighbors. "We don't want to live in a neighborhood where you got to be watching your kids everyday. We'd rather take a chance with the plants" (GP-PI-2-7).
For powerless-with-benefits risk bearers, residents are quick to follow-up any discussion of bearing risk with mentioning benefits that are associated with those risks (GP-FG-9-4):

Resident A: I don’t like the smell or some of our problems with the plants, but I like my job.

Resident B: Would I rather live on a lake or on the beach? Absolutely, but I live where I can work and my kids can go to a good school.

Resident A: My kids can go to school anywhere and learn but I can’t get a job anywhere.

Others added similar sentiments. “There’s nothing we can do about the stench but I have the best friends here I have ever had in my life,” (DP-PI-12-17) and “my kids are getting a great education, means we have to put up with all the trucks and plants and smell and occasional times that we have to remain in our houses for a while, that’s OK with me” (GP-PI-5-13). One Deer Park resident summed up what she thought were her neighbors’ feelings (DP-FG-2-6):

Every place has their own little quirks, and we have ours. The plants here are a part of the city, this place wouldn’t be here without them, but we all benefit from them. You have to make a choice, stay, deal with it, benefit from it, or leave.

Future-Generation Risk Bearers

Improvement for future family generations was frequently mentioned as another positive reason to bear risks associated with living in these communities. All ethnic groups have residents who fall under this category, but in a majority of instances these benefits were discussed among Hispanic male and female residents and African-American female residents. Securing the future for their children, along with their children’s safety, was the most frequently mentioned benefit for living in the community.
One Hispanic mother was attempting to convince a newcomer that the rotten-egg smell of the nearby chemical plants was not terribly bad. What’s important, according to her, is that her children get an education so they can move out of the community as fast as they can, never to move back, and raise a healthy, successful family of their own (GP-PI-1-9):

I know this [presence of chemical plants in the community] can’t be good for me and Bill [her husband], but they [her kids] are young. This is the best way to provide for our kids, give them a good education, at least a chance in life.

One set of parents, discussing the positive reasons for living in the community during a local sporting event, suggested that as parents the health and safety of their children, including providing an education so they can do more than work at the plants, are their utmost concern (GP-FG-5-11):

Resident A: I’m a father now, that’s all that matters [their children].

Resident B: That’s right, my kid’s going to college, is part of a touring company or something like that, has talent, we couldn’t nurture that talent at home.

Resident C: Do you have kids? Until you have kids you can’t imagine what you would do for them. Our kids have a future, that’s the most we can ask.

Resident B: That’s right.

One Deer Park mother, representative of those focused on the future for their children, made it clear she would not stay beyond the benefits for her children (DP-PI-10-4):

Once my kids graduate and they’re done with all their schooling, there’s nothing here in Deer Park that would keep me here. So I’ll find somewhere nice to move to, no more foul-smelling plants, no more trucks at all hours of the night, a little peace and quiet sounds awfully good to me right now.
Powerless Employee Risk Bearers

Though none of the residents who participated in this study worked directly for the chemical and other manufacturing companies, numerous residents identified and shared concerns and stories about powerless industry employees who face increased risks. Anglo males who reside in Deer Park were more likely than any other demographic category to mention plant employees as powerless risk bearers. To a much lesser extent, all the demographic categories of residents shared sentiments and stories of industry workers who bear at minimum similar risks or more likely an increased level of health and safety risks in comparison to local residents.

One resident, a raw materials supply vendor who does not work directly for a chemical company, mentioned feeling sorry for some of the employees who work at the plants (DP-FG-3-7):

Those maintenance guys work long hours in horrible conditions sometimes. I watch them go into the plants sometimes and wonder what they are getting, what shits going to happen to them in the future because they are at the plants all the time. I just drop my stuff off as fast as I can and go home to Houston.

Another exchange involved two parents whose grown children work at one of the nearby plants. They shared a sense of concern for the children who are working in such proximity to toxic materials. At the same time, however, they felt their children were in a position of weakness for not attending college and joining the industry after a few years of working in town in less prosperous positions (GP-FG-8-7):

Resident A: I wish my son would have gone to college. Then he wouldn’t have had to stay here and work for...

Resident B: That’s the problem sometimes, kids can make some quick money with just a high school diploma, but they are not thinking of the long run.
Resident A: They have no control of the direction of their lives.

Resident C: They can make a life out of it, but it’s a bad life, but most get tired of working after a while and leave, and then what are they going to do, or maybe they’re now sick or hurt from working over there, I hate to say this but my kids trapped in a bad job under bad conditions...

Resident A: And he probably does not even know it yet.

Numerous narratives about manufacturing employees bearing additional health and safety risk burdens included various types of acknowledgement that local residents (who do not work directly at the plants) are gaining benefits on the backs on powerless employees. Some mentioned a sense of pride in those who worked at the plants, not dissimilar to the respect many people have for those in the military. “I never worked [at a manufacturing plant], you know, for them, does not mean I wouldn’t have had, but you have to respect it, not everyone is willing to do that kind of work to take care of their family” (DP-OP-22-1).

However, a larger share of this risk role acknowledged a sense of guilt at deriving benefits from the hard work of those who risk their health and safety to work at the plants. “I feel a little bit bad about others working at the plant, while I get to live here safely, and my kids have some great opportunities... those poor guys [plant workers] just have it rough” (DP-PI-4-2).

Bravado Risk Bearers

Another type of risk bearer combined bravado with a limited understanding of associated risks with living in these communities. While other residents viewed themselves or others as helpless and powerless in regard to the negative health and safety impacts due to the processes related to chemical manufacturing, these residents viewed
their sense of risk with a sense of proud ownership and toughness; an us-against-them or a do-it-on-your-own, wild-west perspective. This was one of only two risk roles that were clearly differentiated by gender, with males typically exemplifying this role’s characteristic (GP-PI-10-2):

I don’t worry about living here, it’s kind of fun. My friends from the city won’t even come over here; they don’t understand why I like it here. It’s cool, everybody leaves you alone, my friends think that I’m crazy to live here... that it’s too dangerous, but I really do like it here.

Another male resident described the challenge of living along the Houston Ship Channel. “This is tough living, like my grandfather who worked the coals mines up north” (DP-PI-6-7). Another male resident recalled the last time there was a problem at one of the plants. “They are always shooting off those sirens, I can take care of myself, this is a place where one has to rely on themselves and their families... if something happens, I can protect my family” (DP-FG-4-11). While another male mentioned several times during a focus group that he is in control of living in this type of community, the type of community where hard people live hard lives, mentioning several times that “no whimps allowed here” (DP-FG-4-9, 10, 13).

This bravado extends to those who have passed away. Their narratives feature workers’ illnesses and death (DP-OP-23-2):

A bunch of the old timers, they just give up after they have been retired, and I mean they are retired. They’re dead. Some of these companies have these here boards of people kicking it soon after they leave a plant. Obviously they wouldn’t do that if someone died while on the actual job so to speak. It’s almost like a God-damn place of honor it is.

In this regard, blame was not laid; nor is there apparent anger or resentment. These workers whose names are on the board are warriors and heroes. ”My father worked most of his life here, an oil and gas man through and through, I admire him for
his sacrifices, he was part of that 'Lost Generation' you know, helped make us what we are today” (DP-FG-3-6).

Community Risk Bearers

The last role as risk bearer also portrayed some gender distinctions, being especially prominent in African-American females. As opposed to the more male “bravado” attitude toward bearing risks associated with living in the community, these residents shared quiet stories about how, despite the risks, they work to improve the community in small ways. Unlike many of the bravado risk bearer stories, this role for these residents often had to be coaxed out of them over a period of time. Within these narratives is a sense of community spirit, doing good things for the town instead of putting themselves first.

“Since our congressman hasn’t done anything. And none of the rest, so this is a step toward getting something done. Making things better is the least of things we can be doing” (GP-PI-12-4). While other residents have noticed a change over the years. “We are starting to get things done around here. We’ve cleaned up the school, new ball fields, even new PAs in the city... The library’s good” (GP-PI-13-6). This sense of strength and community often is framed in context of the limits placed upon their living circumstances (DP-FG-2-13/14):

Resident A: The chemical plants aren’t any kind of plus. But here, if you need a cop you get a cop, I know my kid’s teachers.

Resident B: And we all work together, well most of us, to make this a nice place to live. There’s not much we can do about the smog and smoke, but there sure is things we can do to fix up the community. I like that, I know my neighbors, we’re friends...

Resident C: I see my neighbors working on their yards, planting flowers in the spring, picking up trash, you know everybody puts up their lights
now [during the holidays].

Resident B: We are a small enough town that you feel you can make a difference. My husband just works around here, he's not part of the city.

A few men, however, reflected on ways they can both bear health and safety risks while improving the community. One Galena Park man opened up his own local barbershop. He had vast experience in this area but always worked for someone else. He wanted to be part of this town and give something back (GP-PI-4-9):

My shop provides a place for fathers and sons to be together. It's nothing fancy, nothing like my wife goes to, but there are a lot of regulars... And someone is trying to move in next door and fix up the place, make something nice like a pizza stand.

Industry Risk Generators

One of the most consistent roles in the community narratives of chemical manufacturing risks was industry as the role of risk generator. Stories focused on fires, explosions, black smoke, ash, odors, burning flares, and other accidents, crises or operations that seemed to pose health and safety harms. This role is not to suggest that community residents are knowledgeable about the health and safety risks they uniquely encounter (detailed discussion in RQ2 later this chapter). Rather, these residents lump the industry into one large category of risk generator, failing to distinguish between companies and facilities, or what those facilities produce and associated risks. "I think on the whole, the industry in general, they could do a lot better job communicating" (GP-FG-3-6).

Numerous residents focused on the industry in general as the risk generator, as opposed to those people who own and manage these facilities. "I know the symptoms are a real concern. They [managers] try to protect; they don't try to release anything. But it's
a dangerous business; just to operate the facilities is a huge risk" (DP-FG-3-17). Another resident added that it is not the people but industry (GP-OP-27-3):

It’s not the people who work there who are the problem, not even management, or owners, I can’t believe that anyone wants to cause problems for us, but I think when they come to work they forget about who they are and just put the industry ahead of all other considerations. The industry is its own worst enemy at times.

Other residents’ stories shared a similar sympathy for the nature of the business as opposed to particular individuals or companies as generators of risk (DP-OP-40-1):

This is a tough business. It’s dirty. It’s always full of surprises. It’s like anything you build or drive, you are going to have problems. It’s part of living here and working here, I think they all try to do the best they can.

Management Risk Generators

A subset of residents who viewed industry in general as risk generators also considered plant management as the primary generator of risk in the community. Not only did the industry create risks, but management also magnified the risks by not telling the full story about them. African-American and Hispanic residents were more likely to mention the management of the chemical facilities and in particular their failure to inform the public about risks, as risk generators. One African-American female resident noted, "They do not inform you about the chemicals that they store. We didn't know what was going on, just how dangerous it was, until we had this fire. We didn't know what we're living around" (GP-FG-7-13). A Hispanic male noted, "They [plant management] don't care about us because we are always in danger" (GP-FG-1-17).

Some residents were more adamant about the callous disregard for community residents by plant management (GP-FG-6-3/4):

Resident A: That’s the utmost concern to management, financial liability.
Resident B: And don’t forget their investors.

Resident C: I don’t know nothing about that, but they are willing to pay you off rather than address questions. That’s just the way it is with those folks [managers]. They give you a number to contact, and don’t tell you what happened or what was released.

Resident A: It seems like they don’t do anything until people start complaining.

Resident B: And that does not do any good most of the time, you can’t even go talk to them, they always have you talk to some poor employee who listens to all the complaints.

Overall, these residents perceive both the industry in general and facility management in particular as the primary risk generators in the community.

Risk Generator Accomplices

Residents in both communities consider several other groups to be risk generators, including organizations who the risk communication and risk management literature typically consider as risk advocates. These organizations are seen as either willing or powerless co-conspirators with industry. For example, Hispanic residents were more likely to mention local, state, and federal governments as risk generators. "Something happens every day in other neighborhoods, but right here, when something happens, we figure we'll deal with it rather than get government involved… they only make it worse" (GP-FG-1-9). Unique to Hispanic residents is their belief that industry and government are not only risk generators, but also capable of generating further risks as a reprisal for getting involved. "Most of the people live around here work for the chemical industry, so it's like you can lose your job [if you complain]… or most of them work for the city" (GP-FG-5-7).
Another Hispanic male group of residents exemplified this general distrust for organizations that many others consider to have a positive affect on environmental, health, and safety issues around the country (GP-FG-1-7):

Resident A: Hell no, they [local government] are in cahoots...
Resident B: I wouldn’t trust any one of them.

Resident A: What you have to know is what’s it’s like here, in this part of town, the cops don’t come around here unless they after somebody who ain’t done nothing, if you speak out too loud, well, that just gets you into more...

Resident C: And those groups from out of town only come here when they want some publicity, like they really care about helping us, why don’t they stay down here, why don’t you [researcher] stay down here for a while, you all just using us to make yourself feels better.

Many residents, regardless of ethnicity or gender, mentioned that they have no constructive relationships with industry or government. According to one male resident, "They keep everything so secretive," and government officials are "probably just getting money from the refineries" (DP-PI-5-11). The only governmental organization specifically mentioned as having an accomplice role was the EPA (DP-OP-17-1):

I think the EPA has been down here before, I guess they were measuring something related to that accident over there at the big Shell plant, not sure what, I never heard or read anything about it afterward, they probably ended up hiring whoever it is that came... typical.

While some residents considered local, state, and federal governments as risk accomplices, they did not share stories of any other type of organization playing a positive and effective role in monitoring the situation. Many residents do not trust health, safety, and environmental non-governmental organizations and mainly considered these organizations as either inconsequential or harmless, essentially monitoring the situation with little expectation for positive, effective change. “I’ve never seen Greenpeace or any
of those types of groups around here... they all talk about wanting to change things but they don’t ever come down here” (GP-OP-49-4).

A few residents mentioned two non-governmental organizations that locally monitor the environment. "That's why the Sierra Club and Greenpeace come in, to watch over them, but that don’t mean anything good is going to come out of that" (DP-FG-3-16). These narratives typically included instances where organizations monitored the air and water, poking around and asking a few questions, with little direct or observable benefits to community residents. For example, (GP-OP-43-2):

I think these people care, you see them around here everyone once in a while taking water samples, stick things in the ground, always wondered what they were doing, and then you see some report about this or that, this rate of cancer or this amount of mercury in the water. They closed down the fishing pier for a while a couple of years ago. But you never see any change. They try but what can they do.

Risk Bearer Advocates

From the stories of the African-American and Hispanic residents, there were only a few mentions of any group as risk bearers’ advocates. Industry was never mentioned, while activist groups are the most frequently (but not often) mentioned advocate by African-American males. These residents discussed their feelings of isolation and that no advocates would come to their aid. In general, they did not mention any government agency, non-governmental organization or activist group that might speak on their behalf and they did not see media as being interested in them (GP-PI-14-7):

What pisses me off is how on TV you see different American groups – the White House, those doctors with borders group, whatever – you see Americans rushing to help out during this accident or that storm, but you never see no one come down here to help out, not even when something really, really bad happens here... we’re on our own, now why can’t somebody come down here when something happens?
In another example, one Hispanic male described a local government and industry only concerned for the safety of industry employees. "The people who work in the plants are very well protected. They're given protective gear to work around the chemicals but we're not given anything to live around them" (GP-OP-39-3). Overall, their stories share a sense that the neither the city nor other advocates will do anything to protect its citizens. As one Hispanic female noted, "They don't let us know anything so we worry about ourselves" (GP-OP-36-2).

Anglo residents more often shared stories about risk advocates occasionally working on their behalf. Some Anglo residents identified local government and state or federal government as advocates. "I mean they're changing, coming up with new laws, you know to tell people," and "If we were to come to them [city government], they would try to help us or know more about it" (DP-FG-1-7). One group that received praise from residents in Deer Park, regardless of demographic characteristics, was the Deer Park LEPC, including local emergency services such as fire, rescue, and police (the role of the LEPCs is discussed in detail under the third research question within this chapter).

These narratives often identified resignation at the same time. "They're [government] not going to move those big plants . . . That's too much of a loss for them" (DP-PI-1-6). Some residents believed that local government was likely to be a buffer for industry, but could be forced to yield to citizen pressures. "It didn't seem like they were doing anything until people started complaining . . . The squeaky wheel," and "they probably don't know that anyone is concerned unless they go up to them" (DP-FG-3-12).

Overall, risk bearers' advocates were infrequently mentioned. At the same time there were limited expectations from these organizations' efforts. This group is
distinguished from risk generator accomplices for they do not have hidden agendas that are necessarily in cahoots with industry, but rather they regard risk bearer advocates as weak monitors of the situation lacking effort or power or both to positively affect the health and safety for residents in the community.

**Risk Communication Process Variables**

In addition to residents’ perceived roles, the second research question delves further into identifying and explicating residents’ risk perceptions. Over the past 20 years of analysis of risk communication process variables, as analyzed from a variety of traditions within the field of risk communication but primarily from psychometric perspectives of risk, several key communication process variables have been identified. A typology of these variables has been identified in the literature review. This section will focus on key risk communication process variables that were consistently identified in the course of this ethnographic case study, including harms and benefits, uncertainty, control and trust in an attempt to further understand how community residents’ socially construct their perceptions of risk.

**RQ2:** How do near neighbor community residents’ perceptions compare to previously identified risk communication process variables – harms and benefits, uncertainty, control, and trust?

**Harms and Benefits**

One of the key elements within risk communication research is measuring community residents’ sense of harms (risks) and benefits. Sense of risk has been highlighted by numerous leading risk communication researchers (e.g., Covello, Heath, Sandman) as one of the principle elements that need to be understood to develop effective risk communication strategies and tactics. Most prior research projects related to harms
utilized survey instruments that asked respondents to rate the degree to which they agreed or disagreed with statements regarding the likelihood of chemical releases from pipelines, tanker trucks, trains, and chemical plants. This variable operationalized respondents' sense of the likely occurrence of hazards in their community. Sense of risk does not relate to the accuracy or inaccuracy of residents' concerns but that the concern exists. A key factor in risk studies is the expectation that something unfortunate can and will occur.

Of all the previous psychometric variables that were identified in the narratives community residents shared, sense of harms and benefits was a constant and consistent theme. Residents’ sense of harms and benefits was not a common theme in community discourse when not prompted via formal data gathering techniques. In both communities, during participant-observation, community dialogue and narratives lacked any substantial discussion related to a perceived sense of risk living near chemical manufacturing facilities (this is true for all four risk communication process variables discussed in this section). Whether listening to or participating in local residents discussions – during breakfast, lunch or dinners, attending community events, or running errands – residents in both communities did not openly or regularly discuss a heightened sense of risk related to chemical manufacturing. Sense of risk was a topic of many discussions, in relation to how their children were doing in school, health issues such as cancer or asthma, pet health and the health of elderly parents. These health concerns, however, were not discussed within the framework of being influenced by living in these communities.

Within interviews and focus groups, narratives of long-term health, short-term health and short-term safety risks were the most consistent and common themes. No ethnic or gender group displayed identifiably more or less sense of harm (risk) in their
discourse, though there was a unique distinction between certain health concerns for future generations.

Long-term health concerns. Long-term health concerns was the most consistently talked about harm or concern related to health issues, though there was very little discussion about specific long-term health issues. Prompted, most residents were willing to share narratives related to general, long-term health ailments. While asthma and cancer were frequently mentioned as areas of concern or harm from living in the community, the comments were general and vague, usually referring to a family member (most often child) or friend who has the ailment. When pressed in focus groups and interviews, however, no specific details were provided (GP-PI-7-4):

I try not to think about what’s exactly going on, I know we [she and her husband] are probably going to die of some form of cancer or another, that’s not uncommon here you know, but we just don’t talk about it . . . we’ve had a good life you know, a good life, what more can you expect.

One Hispanic Deer Park resident was almost apologetic for not being too specific in her concerns about long-term health issues. Responding to a follow-up question that asked if she felt any sense of risk living in the community. “Long term y’ know, after years and years y’ know, I know a couple of people that have gotten sick and they’re blaming it on the area, I probably should think more about it y’know, I should, but y’know…” (DP-PI-11-3).

There were numerous strong comments regarding the health of future generations among the Hispanic and African-American residents interviewed. For example, "We got to worry about our children and what about their children and their children" (GP-FG-3-4), while another African-American resident stated, "Now, my thing, as far as health, I
think of the long-term effects – my kids with cancer later from something that could've happened here” (GP-FG-6-3).

Though the long-term health affects on future generations was not dismissed by Anglo residents, they were more common and more consistent sentiments by other ethnic groups in the community. As one Hispanic father summer up his feelings (GP-FG-5-5):

I think most parents feel this way because we want our children to live better lives than we lived, and we want to be sure of that because we don't know if they are going to experience any health problems because of this [exposure] in the future. Most of the children have asthma and I don't think these chemicals do anything good for these diseases.

**Short-term health concerns.** While long-term health concerns dominated discussion of harms related to living in the community, there was some mention of short-term health consequences but not nearly to the same extent. Many of the Anglo residents were more concerned about short-term health problems as a result of the “...stuff in the air. Health is everyday, so to me it's more important. Not that exposure wouldn't be terrible, but it may never happen hopefully” (DP-FG-3-6). Many respondents mentioned anecdotal cases of health problems. "It's [asthma] because they're all living around here. You go to bed at night and your car is clean. You wake up and you want to know what all those white specks and stuff are, but I don’t think it harms you in the long run” (DP-OP-47-5).

**Short-term physical safety.** The third consistent harm narratives shared related to concern for short-term safety issues. Short-term safety issues relate to negative manufacturing events ranging from transportation accidents to plant explosions.

One topic residents openly shared their short-term harm narratives about was traffic safety. In both communities, residents shared stories with each other about the
danger of Highway 225 that intersects Deer Park and Clinton Drive that intersects Galena Park. In general, the narratives of traffic safety were much more animated than those related to plant safety. Consistently when community residents shared their most recent war story of driving on either of the above mentioned roadways, it set off a chain reaction of more serious stories, one almost always topping the previous incident described (DP-PI-1-2):

They’re [chemical trucks] are always on the freeways. And, driving you hear a lot about accidents a lot, and spills [from accidents]... and then the wrecks and like the eighteen wheelers on the road. On the freeway, like dropping their load and stuff like that. It always worries me because mom has to drive so far everyday.

One resident who commutes to Houston summed up both communities’ feelings well. “The most dangerous part of my day is driving through town to get to Houston. I don’t worry about the plants slowly killing me with their pollution; I’m gonna get nailed by one of those big chemical trucks well before that” (DP-FG-5-22).

Facility explosions were the second most shared narrative related to short-term safety harms. One interesting discussion among younger community residents (early 20s) in Deer Park is demonstrated in the following dialogue (DP-FG-1-3):

Resident C: Well, they play with... not play with, they work with them [chemicals] and everything. So if you do something wrong, something is gonna happen.

Moderator: Any sense of concern about living next to the chemical plants?

Resident A: Yeah.

Moderator: Yeah, what kind of concerns?

Resident A: Something might blow up.

Resident B: Yeah.
Moderator: That it’s going to blow up?

Resident C: Yeah. I had a friend that actually, it has blown up before and it blew out their windows. And then, the other time it blew up, it broke their foundation so the chemical plant had to repair it and repay everybody in the neighborhood.

Resident B: I think there should be a law about how far away they [chemical plants] should be.

Resident A: Exactly. I mean, because there’s a law about how far away, this may sound unimportant, but how far away you have to be from wild animals, y’know. Like, to have a home, there should be a law against chemical plants, that’s what I think, to start a neighborhood especially. Or to build a home, especially where children are around.

Another Deer Park resident shared her concerns for safety as opposed to health (DP-PI-2-2):

I mean, it may sound corny, but that’s what I really think about, simple accidents. And then, a couple times there have been a couple of accidents not exactly right here, little explosions that shouldn’t have happened. People getting hurt and there’s fire. I have a resident, he’s an EM- a firefighter at Exxon. And there was a fire there right when we first met and one of his friends, he’d gotten hurt. Had caught on fire, and we ended up having to attend a funeral for him.

So, I mostly, I think about like the safety and stuff. And I also think about the - they were bringing that, on trains, it was that. Some kind of chemical; it was really dangerous. What was it called? It starts with an ‘N’, napalm? No. I don’t know; it was a chemical that they were going to use it.

Throughout group discussions, however, there were often times when residents would downplay how often they thought about short-term safety risks. For example, (GP-OP-23-5):

You know it's [manufacturing plants] there but you kind of hope you have it back there on the back of your mind. I think if you worried about that [safety issues] constantly you'd be gone... we can't run around worrying that something is going to blow up.
A series of incidents prior to this case study may have triggered some of the concern for short-term safety concerns. Three plant explosions during 2002 through 2003 in Deer Park, Pasadena, and Baytown may have inspired a higher level of community discourse of community safety as opposed to long-term health concerns. Such events clearly affect data gathering, but the common rate of minor to major incidents in these communities suggests this is a consistent pattern of events over an extended period of time.

At the same time there were a few chemical explosions that continually cropped up in conversations about safety concerns related to living in the Houston Ship Channel area. In one sense, many of the community residents did not distinguish between the different communities when it comes to safety concerns. Residents shared stories about explosions in other cities just as often as they talked about explosions and other major crises in their communities.

For example, the Texas City Disaster (previously discussed in the literature review) is an iconic community event not only in Texas City but also in throughout the Houston Ship Channel. Many Deer Park and Galena Park residents referred to “Texas City,” and without hesitation other residents knew that the topic was not about the city itself but about the explosion that occurred almost 60 years ago. Common references such as “Let’s just hope we don’t have another Texas City” (DP-PI-5-7), “we worry about Texas City” (DP-FG-3-4) or “just as long as we don’t get Texas Cited” (DP-OP-46-1) were common narrative references to that iconic event related to residents’ short-term safety concerns.

Overall, sense of risk was a common narrative theme when the topic was instigated. The fact that residents were not openly discussing the risks of living in the
community in the course of uninitiated conversation suggests that either they are not
talking about it on a consistent, daily basis on their own or these discussions are left to
privacy in homes. This could have either positive or negative implications for risk
communicators depending on one’s vantage point. Industry representatives may take
comfort that potential or probable risks are not a daily item of discussion unless triggered
by event or the introduction of the topic. However, industry representatives should
remain concerned that residents may not be remaining diligent in discussing, processing,
and learning about appropriate risk management protocols.

**Economic benefits.** Similar to conversations and narratives related to harms,
residents rarely if ever talked about the benefits of having the chemical industry in the
community unless prompted. Though narratives and discussions surrounding harms were
more common than benefits discourse, residents did share stories about benefits and
provided more detail regarding the actual benefits as opposed to risks. Specific benefits
included better schools and a sense of community.

The quality of education was the most frequently mentioned benefit that residents
perceive as deriving from having the chemical plants in their communities. “I think
we’re comfortable here because of the schools, I’m comfortable because my kids are
comfortable because of the schools” (DP-PI-1-1).

More often than not, for parents who participated in the focus groups or the
personal interviews, the tax dollars and community support the industry provides to the
area schools are a main reason for staying, living and in some sense supporting industry.
“I wouldn’t live here except for the schools,” (DP-PI-3-2) while another parent, typical of
many residents’ responses, suggested that their schools are some of the finest in the state (GP-OP-33-1):

There’s no question that we have some of the finest schools in the area, for all of Texas for that matter. Our superintendent is now the superintendent for the whole state of Texas, that’s how good our schools are.... Where else can you live right outside a great city like Houston, go there when you need to, but have a nice, safe place for your kids to go to school, get a good education, make something of themselves.

Community benefits. The second most consistent and common benefit was not necessarily economic but rather social, a sense of community and community spirit. Residents in both cities, though to a much lesser extent in Galena Park, were always happy to share why they live where they do. Both cities’ residents talked about how safe they are, that they know their neighbors, that they see their neighbors and friends at community events, and that they can rely on their friends and neighbors when needed. One exchange during a private dinner exemplified this sense of community and how the industry fits into this narrative (GP-OP-43-2):

Resident A: I just love living here (other dinner guests agreeing).

Resident A: It’s hard to explain why, I know some of my friends think I’m nuts but I feel at home here. Of course I wish the air was a little cleaner, or the plants a little nicer, but all in all, all in all we’ve got it good.

Resident B: It’s like with my daughter Nicole, she has lots of friends here, she plays in the park or after school with her friends and I don’t have to worry about her.

Resident C: It’s a safe community, people tend to focus on the pollution or sirens or what mind you, but it’s the people that make this a great place, and a lot of those people are the plants’ people, we’re all in this together, but that makes it a great place to come home to, wouldn’t want it any other way.
Some of the older residents reminisced about how the plants used to open up their gates for spring and fall festivals. “We used to go right down there into those plants, they’d let you walk around, see the changes, no more though, especially since 9/11, that was a great time, hanging out with everybody” (DP-OP-34-2). Other residents from both communities share stories about community festivals and fundraisers supported by industry. “You were there [researcher], just like last week at the fire station, everyone supporting everyone, but them plants make the difference, I mean we all contribute but the plants always make up the difference” (DP-PI-7-3). Overall, narratives about both harms and benefits, when instigated, are a part of the community discourse related to living in a community with a high concentration of chemical manufacturing facilities.

Uncertainty

Traditional risk communication studies define uncertainty as the degree to which subjects doubt their ability to foretell the likelihood of health or safety consequences. As noted previously, uncertainty is a multi-faceted variable, with effects often tied in with other variables. Uncertainty has been demonstrated to have an effect on company support. The more one is uncertain about the health or safety risks related to living in a community with a high concentration of chemical facilities, less company support should be demonstrated. Uncertainty has been demonstrated to also have an effect on sense of control, trust, knowledge and sense of risk. Within the risk communication literature, people work to reduce uncertainties to manage their sense of risk.

Previous research (e.g., Heath & Palenchar, 2000; Palenchar & Heath, 2002) has demonstrated that despite residents’ high level of support for the industry, there still appears to be a wide sense of uncertainty about the chemical manufacturing process,
products being produced, and potential health and safety risks related to living near the chemical plants.

Residents in both communities, and for the most part regardless of gender or ethnicity, demonstrated a high level of uncertainty of the chemical manufacturing process. Residents, without prompting, never discussed the manufacturing process. When prompted during interviews and focus groups or in the course of normal conversations within the community, residents demonstrated uncertainty to how the plants are operated and maintained, how chemicals and other materials in their neighborhood plants are processed, or even any level of certainty of the products being produced in town.

One Deer Park resident, who has family members working in the industry, acknowledged her high level of uncertainty. “I have no idea how they [plants] work, what they’re making, what they’re doing over there…. Sad to say I couldn’t and details of the level of risk to me” (DP-OP-34-2). Another resident nearby echoed her sentiments (DP-OP-34-3):

I couldn’t tell you with any certainty why things happen, it’s like things are fine one day, then one year, but then, you know, something happens, without warning, no reason at all, it seems like it’s always somebody else’s fault or another, y’know, but I don’t even think they [plants] know why things happen, only God really knows.

While discussing pollution with one community resident, for example, she had some opinion on the matter but was uncertain not only in her own position but on the status of pollution in general, with no specific prediction capabilities (GP-OP-21-2):

I don’t think it’s getting any better. I think it’s getting worse before it gets any better. But maybe not. But I think about what I’m inhaling when I go outside. What my kids are gonna be – stuff like that. And if it really ever is gonna get better. I mean they always say ‘okay,’ well they lowered the speed limit so it will
lower the risk of pollution and come out with all this stuff that will help. But it really does not work. Does it? In my thoughts, well I just don’t know anything for certain.

Examples of a resident from either community who was certain about health, safety, or environmental risks, or the manufacturing process of the local manufacturing facilities, were rare. Even then, certainty focused only on a specific product being manufactured (e.g., polymers, chlorine, refined petrochemicals).

Control

In risk assessment, abatement, and communication, control is one of the major variables for predicting risk assessment, acceptance, and support for the source of risk. Control has two dimensions: control through society (i.e., activism or government) and control through individual/personal actions.

Internal control. Internal control, for the purpose of this discussion, has been defined as the degree to which a subject perceives personal feelings of power over some entity or outcome. Internal control is a variable that describes a personal trait, in this case the extent to which one holds power over the effects of chemical facilities’ operations that expose residents to risks. Internal control should have some negative effect on uncertainty. If a person feels personal power over some entity or outcome, that person should feel less uncertain about those risks. Control should also have a positive affect on company support. If an individual feels a personal extent of power over plant operations, he or she is more likely to feel positively toward that facility or at least a sense of indifference rather than opposition. Kasperson (1986) argued that risk communication programs that provide information but deny key publics avenues for asserting personal control frustrate their need to resolve risk issues.
For example, previous research has demonstrated that Anglo residents more frequently mentioned a higher level of perceived personal control over risk, especially Anglo males (Palenchar & Heath, 2002). For example, one resident stated, I don’t necessarily trust them [industry and government], I will just grab my wife and kids and take off” (GP-FG-4-8). Another resident shared stories about keeping scuba gear in the back of his truck. In case of an emergency, he would just drive as soon as he could out of town, breathing oxygen from his scuba tank (GP-OP-17-2):

We’ve talked about this before [from a previous study conducted by this researcher], and I meant it, you want to see it, like I said before you have to take care of yourself, they [plant management] are not going to do anything about it. It’s like carrying a gun around, got to protect yourself.

Many times the lack of personal or internal control was generated by or frustrated by a lack of knowledge about the specific dangers and a lack of knowledge about the manufacturing process of local facilities. “I just don’t know what they do, my father used to work for Getty Oil, and we used to talk about it some, never could understand and I don’t remember any of the details... I think I would feel better if I took the time to learn” (DP-OP-39-3).

At the other end of the scale for example, Hispanic male residents, female residents, and African-American male residents more frequently shared narratives of having little to no control over local risks related to living near a large concentration of chemical manufacturing facilities. For example, one Hispanic male resident explained, “They do what they want, they don’t tell us anything, they are all working together on this” (GP-FG-2-8).
More specific to discussing this sense of limited control compared to other parts of residents’ lives, one female resident became introspective about her lack of control (DP-OP-33-1):

I hate to admit this but I guess that I don’t have much control over what they [plants] do over there. That’s really hard to admit. I consider myself a strong woman, probably stronger than my husband likes... I run our house, I run a small business, I can work the system... but I guess I can’t work, don’t really understand maybe, no that’s not it, I just don’t know if I can do anything to about it.

Overall, residents frequently shared personal feelings within narratives of lacking personal control over issues related to living near chemical manufacturing facilities. This sense of lack of control often interrelated with their lack of knowledge, and their lack of specific awareness of the harms.

**External control.** External control, for the purpose of this analysis, has been defined as the degree to which subjects perceive an organizations’ extent of power over some entity or outcome. External control is an individual's perception of control by another individual, group, or entity. In this case, external control is an individual's perception of the extent of power that outside organizations (government and activist groups) have over the operations of chemical facilities that expose residents to risks beyond their control.

External control can also refer to chemical facilities’ control over the risk source. External control should have some negative effect on uncertainty. If a person perceives that an organization has some extent of power over the chemical facilities or that the industry itself is in control of the manufacturing process, that person should feel less uncertain about those risks. External control should also have a positive affect on company support. If an individual feels that an organization has control over the
chemical facilities (entity) or a specific risk (outcome) at its plant, the more company support or at least indifference should be demonstrated.

It was difficult to ascertain residents' sense of external control by organizations other than the industry because residents rarely mentioned positive control aspects by such organizations as regulatory agencies, non-governmental organizations, or local activist groups. In no sense did the few mentions of external control organizations yield positive attitudes toward industry or a reduction in uncertainty related to risks in the community. The Deer Park LEPC was mentioned has having control in aiding during a crisis situation, including the rescuing of lives, providing limited information about leaks and accidents, and general SIP communication campaigns, but this awareness of Deer Park's LEPC efforts did not translate into a sense of external control over the industry to reduce or prevent health and safety risks for residents of the community.

Within the community narratives shared by residents, control by the industry was more frequently mentioned. One consistent theme was that the industry did not have that much control over the risks, but that they have been essentially lucky. For example, one exchange among community residents (GP-OP-47-3):

**Resident A:** I don’t think they know what they are doing. Most of the time we’re just lucky nothing happens more often.

**Resident B:** There’s not much they really can do, you know, you’re working with dangerous stuff, mistakes are going to happen, I think they try and stuff but at some point things just happen, you can prepare and practice and do your best but when it happens it happens, when it’s time it’s time…

**Resident A:** Yeah, but they could do more, it’s like they just take a chance, they keep cutting jobs and stuff, less people to do the same work, I don’t even think they train some of those temporary people they have working over there.
Resident C: They do their best to control their operations but at the same time it’s not always in their hands.

Other residents who shared stories about their sense of industry control over their manufacturing process viewed a workforce that is constantly working to maintain control. These residents clearly differentiated their positive sense of external control related to plant employees from a less positive sense of control by management in particular and the industry in general. “They [plant workers] work hard at keeping up with the latest technology, they are always doing things over there to prevent accidents, etc., but it’s hard, those guys work their tails off to make it as safe as possible” (DP-PI-8-5). Another resident summed up these conflicted perceptions of external industry control well (DP-OP-47-3):

If you let the engineers run the show I feel comfortable but when you hear about some outside investor coming here and buying up a place that makes you nervous, you know they are going to cut back, take more chances, focus on the bottom line. I truly believe you can make a safe product around here if they take the politics and bullshit out of it.

While there is a sense of lack of external control among most residents, this is not necessarily seen as a restraint on their own behavior. Important to the ability to exert control, constraint recognition is the extent that people perceive constraints "that limit their freedom to plan their own behavior" (Grunig & Hunt, 1984, p. 151). Because they no longer believe they can yield to constraints and allow others to exert control, citizens are becoming less likely to defer to decisions made by officials and experts, "the decline of deference" (Laird, 1989, p. 543).

Trust

Trust is defined as the degree to which residents believe the sincerity of chemical companies and other related organizations’ communications, actions, and interest in the
safety of citizens, employees, and the environment. In addition to estimating the respondents' sense of trust in industry performance, trust in government is another risk communication process variable which operationalizes their trust related to opinions toward elected city officials and fire/police officials regarding the danger or safety associated with a release.

Trust is also a vital part of this narrative. People in each community where risks occur must be able to trust the efforts to achieve reasonable levels of security. Such levels need to withstand the "smell" test of the area residents that they could and should trust industry to exert reasonable amounts of security and communicate in ways that increase rather than decrease citizens' security.

Residents' trust in third-party experts and organizations, as operationalized by previous research, is those related to opinions toward a medical doctor or university chemical expert regarding the danger or safety associated with a release. Researchers can also include trust in outside non-governmental organizations and activist groups. These items typically asked how much trust respondents would have for the opinion of these experts. Persons who score high on this variable would seem to be ones who believe those key experts in the community will exert intelligent professional control over emergency situations on their behalf. Similar to those people who have a sense of trust in government officials, such persons tend to believe in community control rather than think that they must exert personal control in the event of an emergency.

Trust is a central factor in predicting whether members of a community accept and rely on the conclusions and recommendations of people who are trained in science, national security, business operations, engineering, emergency management, and public
policy. Risk assessments require scientific and decision-making techniques that are often foreign to lay public. If expert risk estimates conflict with one another, the decision to be made becomes more complex and requires greater amounts of trust. For effective risk communication, the source of information and advice needs to have a satisfactory level of trust in the judgment of each public (Renn & Levine, 1991).

**Trust in industry.** Similar to those people who have a sense of trust in government officials or third-party experts, we would define such persons as believing the chemical industry will control rather than assuming that they must exert personal control in the event of an emergency. Trust in industry was a fundamental part of many community narratives in regard to living near such a large concentration of chemical manufacturing facilities. "The question will always go back to trust. Because if we did petition to find out what's in there, do we trust them enough to tell us the truth? The exact hazards? Exactly what causes it?" (DP-FG-10-4).

Residents' level of industry trust varied dramatically. For example, African-American males more frequently mentioned a complete lack of trust in industry than any other ethnic group (GP-OP-14-4):

We're talking about a fact that the past, and you ask me, 'do you trust me?' No, as far as trusting them, you have lied to me, you've pushed me into various situations, you've made me walk along, unknowing to myself, and now there's a situation, that you need me, and you're asking me 'do I trust you?' Hell no, I don't trust you.

African-American and Hispanic residents more frequently mentioned a complete lack of trust. As another African-American male mentioned, "There's too many things that they try to keep covered up, you know. If I'm supposed to trust you, then you're supposed to
tell me everything," and "there's always something going on under the table" (GP-FG-7-5).

Few residents mentioned a sense of trust in the chemical industry to ensure their health and safety. Comments such as "yeah, I trust them" and "they do their best, that's what makes me trust them" were typical descriptions within narratives. However, most stories related to trust in the industry related to trusting industry to help out in the community, provide jobs, and support education efforts as opposed to health and safety concerns (DP-OP-39-6):

I trust them to make the city as nice as possible, like the great schools, we even have a golf course that wouldn't be here probably without their money, but what they can't give me is a healthy place to live, you just can't go outside on certain days.

Trust in government. Throughout the discussion in previous sections of this report, mention is made of the centrality of governmental officials in the emergency response process. In previous research, trust in government officials correlated with trust in industry officials, trust in third-party experts, and knowledge of the LEPC (Palenchar & Heath, 2004).

Without prompting, residents did not share stories demonstrating positive trust for local, state, or federal governments in the role of protecting residents from manufacturing risks. Within focus groups and personal interviews, however, trust in government ran a wide range of perceptions. Like trust in industry but not to the same extent, many residents do not trust government to protect them. "I absolutely don't trust the industry, and I don't really trust our city officials either" (GP-PI-4-5). Anglo residents were more likely to trust government as compared to either Hispanic or African-American residents. As one Deer Park Anglo resident described a recent community event: "I think they do
[local government officials] some good things, they tell us what’s going on, I just got
some information in the mail recently about what to do in the event of an emergency,
yeah I trust them” (DP-OP-37-3). Another resident shared what is more typical; a
reluctant sense of trust of government officials. “I don’t have a choice but to trust them,
what’s my other option? If I think about it too much I would probably have to, uh, so I
trust them, yes but only so much” (DP-PI-5-7).

**Trust in third-party experts and organizations.** Consistent with narratives related
to outside non-governmental organizations’ ability to exert control over industry risks, as
well as identified but extremely limited roles of risk advocates in the community, there
was no mention of having trust in these type of organizations. This is inconsistent with
traditional risk communication and risk management literature that argues for the use of
third-party experts to provide key information regarding harms and benefits, and
appropriate behaviors during an accident (e.g., Palenchar & Heath, 2002).

Overall, trust may be a counterpart of control. It assumes that when people are
vulnerable in one way or another to one another the matter of trust becomes relevant.
Industry would like to say, “Trust us because we have planned and put policies into place
that will reasonable protect your interests, your security, and safety.” People are
vulnerable to the quality of planning by industry and outside organizations. Industry is
vulnerable to the cleverness and treachery of terrorism. Employees, investors, customers,
and community members are vulnerable to dangers of chemical manufacturing to the
extent that the relevant industry is vulnerable. Trust is demonstrated in word and deed. It
is groomed and maintained. It can be lost or destroyed. Thus, it is a precious ingredient
in community relations.
Community Risk Perceptions of SARA Title III and Responsible Care

The third area of analysis focused on community residents' risk perceptions of emergency response preparation protocols as required by SARA Title III and the Responsible Care program. As previously discussed, the EPCRA of 1986, section three of The Superfund Amendments and Reauthorization Act of 1986 (SARA Title III), gives the EPA oversight of risk communication efforts, including efforts related to the formation of LEPCs. The Responsible Care Program, developed by The American Chemistry Council, is an industry initiative that functions to meet the requirements of SARA Title III. Responsible Care works to achieve improvements in environmental, health and safety performance, as well as developing industry risk communication tools related to community emergency response preparation.

Overall, legislators believed SARA, and in a similar vein the chemical industry believed the Responsible Care Program would create a communication apparatus and strategic business planning process to empower people regarding risks they worry they suffer by providing information about community risk concerns related to chemical manufacturing. Taking this into consideration, the following research question is raised:

RQ3: How do near neighbor community residents' risk perceptions of emergency response measures compare to some of those required by the following federal and industry community-right-to-know legislation, policies and guidelines: SARA Title III, LEPC, and Responsible Care?

Overall, five unique areas related to emergency response preparation are discussed, distinguished by each community. These include: LEPC, Wally Wise Guy and SIP, Emergency Response Alert Systems, TRI, and the Responsible Care Security Code.
Deer Park

Deer Park, as part of the Deer Park outreach area, has 100 EPA-regulated facilities and 29 major manufacturing, storage, and transportation facilities that are regulated by SARA Title III and affected by the industry’s Responsible Care Program. In general, Deer Park’s LEPC, established since 1986, has well attended monthly meetings and maintains an annual budget of approximately $100,000. Deer Park’s LEPC emergency response protocols, in conjunction with associated police and fire departments, utilize a vast array of emergency management protocols to alert community residents of industrial accidents at the chemical manufacturing plants. Within the industry, Deer Park’s community risk communication efforts set the standard in the country. For example, Deer Park’s LEPC campaign won the 2003 Chemical Education Foundation 2nd place national award for LEPC achievements.

LEPC. Perhaps one of the most important elements of emergency response management in the City of Deer Park is the local LEPC. A 2002 survey identified that 58 percent of Deer Park residents were aware of the LEPC in their community (Heath & Palenchar, 2002). A majority of the residents are clearly aware of the LEPC, though most are unable to say what the acronym actually stands for. Beyond a basic description of the LEPC, residents lacked a detailed awareness of the role of the LEPC. Few residents were able to describe the basic functions or when and where the community meetings took place. Typical of residents’ level of awareness was this description. “I know what an LEPC is… but I can’t remember what they actually do… I know it’s something about helping keep us safe, they let us know what to do if a plant explodes” (DP-PI-6-7).
Some residents were aware of the LEPC due to recent emergency training in the community. The Deer Park LEPC annually conducts emergency response training, with simulated situations that involve the police and fire departments, city offices, and local health care service providers. One such training was conducted during the course of this research project, and jolted quite a few residents' memories of the training and LEPC (DP-PI-12-8):

They [LEPC] train for explosions and so forth all the time, and the industry does too, you can see them every once in a while, with students laying out on the grass pretending to be hurt by an explosion, they [LEPC] are the ones responsible for those simulations.

To a lesser extent, a few residents were aware that the LEPC is responsible for monitoring the hazardous chemical storage reporting requirements. Though storage units are rarely talked about in the community, quite a few residents perceive the LEPC as one of the groups monitoring what is held in the large storage tanks just across the highway from the city. “The LEPC puts their name right on some of the storage tanks for everyone to see. I just assumed that’s their stamp of approval” (DP-PI-5-5). However, the LEPC logo on storage tanks is actually in Pasadena, Texas, the city directly west of Deer Park, and is not a seal of approval but rather a means to increase awareness of the LEPC in Pasadena.

Residents also perceived the LEPC as a positive information source in the community via the numerous risk communication materials they produce and distribute on a regular basis. The most recognized and positively perceived communication tools are an annual household hazardous materials collection day, school book covers and grocery bags with emergency SIP information, cable television notices with SIP
protocols, and an annual calendar distributed to residents and businesses with SIP and other appropriate risk management information.

Individually, residents are not aware of all the communication tools used by the LEPC, but collectively, many residents are receiving the message about SIP (DP-FG-3-6):

Researcher: Where have you seen SIP information?
Resident A: Wally (laughter). And the calendars...
Resident B: Those are great, I grab a bunch of those every year for my kids, the office, the garage.
Resident A: And my kids really like the poster contest.
Resident C: I used to get it in my cable bill, but I think they stopped doing that.
Researcher: Any other places?
Resident C: Not really.
Resident D: They have them on the computers down at the library.

For the most part, however, residents who are aware of the LEPC perceive the organization as a positive in the community, another means to help protect the residents of the community. The LEPC, for a few residents, is an example of why Deer Park is a great community, with a caring industry and city government, that provides a wide variety of services, including those in emergency response preparation and management.

Typical of some residents discussing their LEPC (DP-FG-4-7/8):

Resident A: I think we all know what the LEPC is, right? (several focus group members verbally and non-verbally agree). They work hard to let us know what’s going on in the community, but people just don’t attend the meetings, everyone’s too busy.

Resident B: I don’t go to the meetings but I see the announcements in the paper, I always wondered what exactly they did in those meetings.
My neighbor goes, but I think she likes to attend because of the free food.

Resident C: I don't think you really need to go to the LEPC unless you have a problem, they are always asking people to call if they need any information, but I hear the sirens, they operate those, right? I know what to do.

Resident A: That's the great thing about living here, we have all kinds of great services here, you don't have to wait in line for half a day to do something or get some information, I can just go down to city hall and ask them what's going on.

Overall, these findings suggest that the LEPC is increasingly being associated with the information people receive about emergency response practices, at least within Deer Park. The LEPC logo lends credibility to emergency response information and has over time established the LEPC as the focal, credible source of emergency response information relating to chemical incidents.

**Wally Wise Guy and SIP.** The Wally Wise Guy risk communication campaign focuses on a character-turtle to inform children, and indirectly other community residents, about SIP procedures during an emergency incident. Wally asks residents to SIP: go/stay inside homes or businesses, turn off air conditioning/heating systems, stay off the phone, and stay tuned to the emergency radio station for more information.

Communication tools used as part of the ongoing risk communication campaigns range from attending community events, to public service announcements to coloring books.

Wally is probably the most recognizable risk communication tool used by the LEPC. A 2002 survey demonstrated that slightly more than half (55 percent) of Deer Park residents over the age of 18 are aware of Wally, a group that is not even the target audience of the campaign (Palenchar & Heath, 2002). That number may be even higher now as most residents were able to talk about Wally with some level of certainty about
who he is and what his message is and a majority of residents were able to point out Wally. For example, Wally attends various community functions, including the local high school football games at times. Following Wally around that evening one hears residents greet Wally like an old friend, “haven’t seen you for a while Wally” (DP-OP-52-3), or fondly laughing about the big, green turtle as he/she passes out SIP information. Wally does not talk but conversations are a common occurrence, with Wally gesturing and passing out information to children and adults alike.

A majority of residents are not only aware of Wally, but are also aware of his/her message, or at least have a common sense version of Wally’s safety message (DP-FG-1-8):

Researcher: What does Wally want you to do?
Resident A: Wally wants us to SIP? (several others agree).
Resident B: Yeah, Wally is always telling parents and kids to stay inside your house during an emergency...
Resident A: And listen to the radio... and turn off your air conditioners.
Researcher: Is everyone here familiar with Wally and SIP?
Resident C: I’m not exactly sure what SIP is, but I know that Wally wants us to be safe, and I guess that means staying away from any problems at the plants, don’t go check things out yourself, stay inside whenever you can.

Though residents may have some confusion about what all the elements of SIP are, it is clear to many residents that Wally wants people to be safe during accidents by staying indoors.

In other ways, Wally has become the soft, cuddly, clean face of the industry and city emergency protocols. As one resident shared over breakfast, Wally is just a part of this city. She couldn’t imagine Deer Park football games and festivals without Wally
hanging around. According to her, Wally is “just precious and the kids love him too” (DP-OP-52-6). Probably the worst things said about Wally during the course of this research project were a few off-handed remarks shared by several young men at the local football game. These young men, recently graduated from high school, made fun of Wally as he passed by the group, ribbing the size of his belly and his “stupid colors.” One pointed comment suggested that Wally might be “better off dead,” with the group generally agreeing that they are “sick of Wally” (DP-OP-45-2).

One of the concerns from previous research related to SIP is the number of residents who indicated that they would attempt to leave/evacuate in the event of an emergency. They seem to trust their own judgment more than that of officials or do not know the advantages of taking the emergency response measures recommended by experts on emergency response. A 2002 study (Palenchar & Heath) found that six percent identified leave/evacuate their home as a protective action during an emergency. Though research has shown this number has declined from a high of almost one-quarter of the residents suggesting to take that action in 1995, some residents maintain that SIP is not the best course of action (DP-PI-8-10):

Why would I stay in the city if there is an explosion? The air is bad enough on a regular basis, I’m not going to lock myself in my house and let someone else tell me when it’s OK to go outside. And who is the one telling us it’s all OK – the plants, hah.

Like this male resident, others expressed their concern with who is telling whom not to evacuate. “Of course the city is not going to tell people to evacuate, they are in cahoots with all the companies… you have to take care of yourself” (DP-OP-55-4).

Another area of concern for residents regarding SIP is the role of public schools in the SIP, emergency preparedness process. Under the guidelines of SARA Title III, the
Responsible Care Program, and along with other state and federal regulations, public and private schools are required to SIP in the event of a chemical incident, essentially locking and isolating children from their parents for the duration of the incident. According to a 2002 survey, more than 93 percent of parents are confident that school officials will protect their children, with only 16 percent of parents indicating they would go to the school to check on or try to pick up their children (Palenchar & Heath, 2002).

Parents’ perceptions, in reality, were quite different from the previous research results. Several parents shared a story in which many high school students were standing on top of one of the buildings during a SIP in an effort to get a better view of the explosion. “If they can stand on top of the buildings and watch, well, who’s watching out for them” (DP-OP-44-11), and another parent acknowledged that the schools can probably take care of the children, “[B]ut I can’t just stand by and do nothing… I’d go get my child, and probably kick down the door if I have to” (DP-FG-4-16). In one sense, asking parents to trust somebody else with their children during an emergency is counterintuitive to parents’ natural reactions. Most of the parents were also surprised to find out that SIP protocols ask them not to call the school during an emergency to check on their children; too many phone calls overloads the telephone services and interrupts with emergency phone systems. “That’s a crock of shit,” (DP-OP-47-1) said one parent during a football game, indicating there is no way she is going to leave her children at school and not be able to reach them. Most mentioned calling their kids on their cell phones. “Just like Columbine, all the kids were crying, calling their parents… and the parents were also frantically calling their kids… you have to get that information for yourself nowadays” (DP-PI-1-14).
Emergency Response Alert Systems. The City of Deer Park, along with the LEPC and industry, uses a variety of community emergency response alert systems in the case of a significant toxic leak, accident at the plant, and plant explosion. These systems include a local emergency radio station; (CAN), which is a computerized calling system that automatically dials community residents phone numbers that are listed in the local city directory and provides information about the chemical manufacturing incident; First Alert, which is an emergency notification system located in the school administration building, as well as all schools and public buildings, delivering emergency messages; the CAER Line, which is a telephone number that residents can call to find continuous information about an emergency incident; and the community and plant siren system, which covers the entire city of Deer Park with PA announcements regarding emergency situations.

Without prompting, local residents did not share stories of the benefits or problems with emergency warning systems. However, in other prompted discussions, residents perceived these emergency alerts systems as one of the benefits of living in Deer Park. “I know for a fact that other cities, like La Porte, don’t have as good a systems as we have” while another resident suggested that they provide “a sense of comfort at night” (DP-FG-6-11). Most of the residents immediately knew when the siren system was testing (first Thursday of the month, 6 p.m.) and pretty much ignore it. One resident explained how she almost does not even here the testing siren, but when it’s another time of the day she really notices it, acknowledging, however, that she does not understand all the different sirens (DP-OP-41-1).
Toxic Release Inventory. One of SARA Title III’s major four provisions is the establishment of the toxic chemical release inventory (Section 313), which is a publicly available EPA database that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. Covered facilities must disclose their releases of approximately 650 toxic chemicals by roughly 23,000 factories to air, water, and land, as well as the quantities of chemicals they recycle, treat, burn, or otherwise dispose of on-site and off-site.

However, in all the community discussions, interviews and focus groups, awareness or knowledge of the TRI was very infrequent. No resident brought up the TRI database in the course of normal conversations, though a few residents were familiar with TRI. The residents that were aware of TRI, however, were not alerted to its presence from materials distributed either by the industry, LEPC or city, but rather was accessed on a Web site in the course of conducting research about the community or writing a paper for college or work. One resident described about how he went to the EPA Web site and found this great site, full of information “about how terrible the air in Houston and Deer Park is” (DP-OP-52-3). Another resident, ironically on the same day, mentioned that she was writing a paper for a course in the local community college, and she had to find out information about the environmental effects of the chemical industry. Her professor informed her of the Web site, and she was “just absolutely shocked” about the air and water quality in “my town” (DP-OP-52-6).

Responsible Care Security Code. A recent addition to Responsible Care is the Responsible Care Security Code, developed in response to 9-11, which focus is to
safeguard against potential terrorist attacks, expand industry relationships with law enforcement, provide a model for chemical site protection, and provide information to the community regarding security efforts that do not jeopardize plant security. Surprisingly, Deer Park residents did not share a high level of concern regarding terrorist threats. Residents are aware that their community is considered a high-priority target because of the nature and toxicity of the materials produced at the plants in the community. As one resident commented echoing others sentiments: “I know that they [terrorist] would like to blow up this whole damn area, but if I know one thing, these plants are prepared” (DP-FG-3-7). He continued that if there is one thing the plants can do is stop people from getting on the property at the plants. He asked if I ever tried to sneak in a plant. “They would stop you before you jumped the fence” (DP-FG-3-7). Another resident reinforced that sentiment, but with a different perspective (DP-FG-3-8):

I think it would be very difficult, and I mean very difficult, for them [terrorists] to blow up a plant. The plants might not spend the money on keeping the odor out of the air and other health stuff as much as they should, but you can bet they will spend every last dime to keep the plants secure – they have to or they wouldn’t survive.

Galena Park

At present, Galena Park, as part of the North Channel outreach area, includes 44 EPA-regulated facilities, with 14 of those major manufacturing, storage, and transportation facilities. The Galena Park CAER Team was established in the late 1980s in a joint effort between industry and the City of Galena Park as part of the requirements of the Community Right to Know Act. The Galena Park LEPC meets once every other month and maintains an annual budget of approximately $30,000. The Galena Park LEPC does not utilize a public relations agency for the development or implementation
of their communication efforts, and does not conduct an evaluation of their communication efforts.

**LEPC.** The Galena Park LEPC is not as active as many of their counterparts along the Houston Ship Channel. Meetings are held every other month instead of the standard monthly, and public participation is extremely limited, often with no public citizens in attendance. There are no baseline figures available to discern the extent to which community residents are aware of the LEPC because they do not conduct community relations nor risk communication research. Residents typically were not aware of the Galena Park LEPC, their purpose, when and where they met, who comprised the members of the committee, or their role in the community. Typical of this kind of complete lack of awareness were responses such as “I have never heard of them before” and “You got me, who are they?” (GP-FG-2-7).

The few residents who have heard of the LEPC typically did not have high regard for the committee. “They don’t do nothing, they talk a lot, but when you get down to it, all they care about is if the chemical companies are happy, the tax base” (GP-PI-10-8). This perspective towards the LEPC was common among all the ethnic groups in Galena Park, but especially so for the Hispanic community. “The LEPC is like all the other groups in town, if you are important they will listen to you, you know, but they are not going to listen to me, it does not really matter” (GP-PI-4-13).

**Wally Wise Guy and SIP.** Wally Wise Guy is probably the most recognized risk communication tool in Galena Park. Despite limited funds and lack of volunteers to man the costume, Wally does get out to major community events, including football games,
the community center, and library activities, as well as numerous school functions. Many of the residents are aware of Wally, but few are aware of his message concerning SIP.

One parent described how her kids love Wally, but when it came to understanding his safety message, she had no idea (GP-PI-1-1). Other residents have typical responses to Wally. “My kids loves that turtle, she always gets excited when he’s around the park that she plays in. I think it’s great for the kids but I have no idea what he’s saying... he does not speak” (GP-OP-19-7).

The SIP message of Wally and other risk communication efforts in the city is up against some tough cultural perspectives. Both the Hispanic and African-American communities in Galena Park are either not paying attention to nor receiving the messages about SIP, and as the same time do not necessarily trust the messenger or the message itself. As one Hispanic father furiously pointed out, “They never put a damn thing in Spanish” (GP-PI-4-9), and those sentiments were echoed by other Spanish-speaking residents (GP-PI-2-14):

They [industry, city government] always have Wally at their events, at their side of the town, I think I even saw Wally at the opening of a new store on their side of the town, I never see anybody over at ______ store passing out information – in English or Spanish.

One exchange of Hispanic residents highlighted the lack of trust in the messenger and the lack of details or awareness of the actual messages (GP-FG-5-9):

Researcher: Have you ever heard of SIP?

Resident A: No (most of the others also say ‘no’).

Resident B: Having some sort of protection in your home?

Researcher: Not necessarily built into your home, but if an emergency
occurred, and you were warned, then you might close all your windows and turn off your air conditioner or the heating system...

Resident A: I heard them say that on the news before.

Resident B: They tell you to don’t go outside and turn off the air conditioning.

Resident C: Close all the windows.

Resident D: Suffocate – you know.

A major concern of SIP emergency response protocols revolves around convincing residents to not leave or evacuate in an emergency unless they are told to do so by civil and plant authorities. Many residents, when pressed on what they would do if a plant explosion occurred nearby in the community, expressed that they would do what they have to do to keep themselves and their family members safe (GP-FG-1-23):

If I felt as though my life or my kids’ lives were in danger, I would evacuate on my own. I mean if there was really a bomb in Pasadena, that’s close enough for me, if it had been determined that there was one there, I would have packed up my kids and dog.

At the same time, others were not so sure they would evacuate but they weren’t sure they trusted authorities that staying in town would also be a safe option. As one white, female resident described a possible scenario (GP-FG-8-24):

There is something else to consider. If there is a mass evacuation, how safe is it going to be to evacuate? I’ve always said that about a hurricane. My children have all moved, and they say, ‘why are you staying down in that terrible part of the country, with all those chemicals, and this and that, and the hurricanes. If one hits in your direction leave.’ In the first place, it might be OK. But I can run all the way to Dallas and get hit by a tornado instead. In the second place, I may never make it to Dallas because I could get hit on the way. I’d be just as dead. If you’re dead, you’re dead. It does not matter how you get that way, you’re dead. So I would feel the same way about this situation [plant explosion]. If I’m gonna die, I just as soon go to bed and let the chemical kill me and not wake up, than get mashed by you-know-what.
One aspect of SIP that some Galena Park residents have some sense of confidence in was in regard to the protection of their children at school during an emergency. Schools, along with churches, were two types of organizations that residents entrusted their children with during emergencies, and though numerous residents suggested they would probably be inclined to get their children if a serious incident occurred, they had some amount of faith in the schools to protect their children. Indicative of this sentiment, one mother said that is why the family moved to Galena Park. “That’s why we’re here, great schools, the teachers really care, I get together with them all the time, I’m pretty sure they know what to do if something should happen at the plants” (GP-PI-3-17).

Emergency Response Alert Systems. Emergency notification systems and protocols are essentially the same in Galena Park as Deer Park, adding the siren system that covers the entire community within the past year. However, there appears to be a limited amount of risk communication efforts to alert residents of the system. Messages in the newspaper and the actual sirens themselves were the only two ways mentioned in which residents knew about these systems. Most just knew it from living in the neighborhood, and gathering details about the system from friends, family, and neighbors when they moved into Galena Park. One male resident recalled hearing the practice siren for the first time (GP-OP-24-5):

I was like, oh my God, what is happening, what do I need to do, I knew it could be dangerous living near the plants, but the rent is cheap and I didn’t think nothing of it, I’m running around all crazy to only find out that it’s a test of the system, they do it every month, now I’m used to it. Now I tell my new neighbors what it all means.
He admitted, after some discussion, that he probably should not be the one to tell new neighbors what the sirens mean or how the system works. “All I know is that if there is an emergency, I’ll call my neighbor and get the hell out of town” (GP-OP-24-5).

Even the expansion of the siren system to include all of Galena Park has upset some residents. One African-American resident strongly asserted her position on the expansion of the sirens. According to her, the older siren systems were supposed to cover her neighborhood, where she has lived for almost 40 years. But according to her, it failed to go off several times, and she had to hear about it [explosion, leak] from her friends through phone calls. Now, according to her, the expansion is just covering the new neighborhoods to the north, the neighborhoods that do not need them because they are farther away from the plants, while her neighborhood continues to be ignored. “They take advantage of us because we don’t complain much over here” (GP-PI-6-5).

Overall, several residents summed up their perspectives on the siren systems. “It would be good if you could understand it. Nobody can understand it, so people go ‘whatever’ and go about their business,” while her friend added “that I can’t ever recall hearing [the siren], being inside my house” (GP-FG-5-21/22).

**Toxic Release Inventory.** Not one person brought up or discussed TRI. When some residents found out about the database from participating in the study, there were mixed comments. Several residents exclaimed that it was a great idea. They should put that type of information out there, why haven’t they before, he asked? As the informal discussion continued, his wife wondered if she would be able to use such information. She explained that they don’t have a computer or access to the Internet, though her
children do at school. She expressed a sense of relief that at least her kids could access that kind of information (GP-PI-12-21).

Several other residents, mainly Hispanic, expressed reservations about the information on the system. One resident challenged the notion of such a database. “I can’t believe they have that” (GP-PI-2-8). After walking over to a nearby bakery for a phone connection to tap into the Internet, she was surprised to look at the TRI data on a lap top. After acknowledging that such information was available, he immediately questioned the authenticity of the information. “I don’t trust them (EPA), don’t even know who they are” (GP-PI-2-9).

Responsible Care Security Code. Similar to awareness and perceptions of the Responsible Care Security Code, residents have not heard of this code. No one who participated in the research project recalls any aspect of this code, or had even heard of it. Instinctively, residents know that the plants have beefed up security. However, that is not necessarily appreciated by many of the residents. “They’re not doing nothing about that [health],” (GP-PI-4-7) one resident argues. Ever since 9/11, he argues, the plants have spent all their money that was going to pollution controls and long-term health concerns to plant security. “They put up new fences, and cameras all over the place, I don’t even like to walk around there” (GP-PI-4-19). His brother joins in the discussion. “We needed that, Houston is at the heart of a possible terrorist attack… I feel better with the extra security… what pisses me off is that they were able to get all that done ASAP, but when you ask them to do something for the city, they are always ‘looking into to it’ and nothing gets done” (GP-PI-4-19).
Similarities and Differences

Of the research related to the effectiveness of the risk communication protocols of SARA Title III, and specifically the LEPCs, most of the research (with the exception of Heath, Bradshaw & Lee, 2002) has focused on the creation of the LEPCs, their effectiveness at disseminating risk information, and the perspectives of the LEPC's efforts from LEPC representatives' perspectives. Conn, Owens and Rich (1990) summed up both the strengths and weaknesses of the LEPCs. Their research identified that LEPCs were capable of sharing technical communication with community residents, but they lacked sophistication in community dialogue, involving residents in the planning and research process, and failed to stimulate community dialogue. They cited the problems of promoting their existence, poor location of outreach offices, and the lack of assistance to the community in deciphering complicated manufacturing information. Baram, Dillon and Ruffle (1992) case study research identified significant progress in chemical manufacturers' reducing emissions, preventing accidents, planned emergency responses, and communicating risks to the public. However, their research suggests that the changes were the result of internal initiatives rather than pressure from citizens groups or LEPCs.

The Community-right-to-know provisions help increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. States and communities, working with facilities, can use the information to improve chemical safety and protect public health and the environment. While the guidelines of community right to know are consistent regardless of community, cultural, ethnic and gender differences, educational levels, and other socio-economic-demographic characteristics, there are clear differences in how community right to know
provisions are executed by industry and government agencies, perceived by community residents, and acted upon by community residents in times of minor to major crises.

Acknowledging these differences, the following research question was posed:

RQ4: What are some key differences and/or similarities between the two communities regarding the near neighbor community residents’ risk perceptions and their role in the risk management and emergency response preparation process associated with the production, storage, and transportation of chemicals in their community?

Though there are numerous similarities and differences between the two communities’ residents in this matter, this discussion will center on the following three characteristics:

a) Increased sense of risk in both communities despite or maybe because of risk communication efforts and community-right-to-know provisions.

b) Support of the chemical industry and increased awareness and knowledge of risk management and emergency response protocols as a result of strategic risk communication campaigns conducted by an LEPC.

c) Similarity in both communities’ residents constructing narratives to justify their risk perceptions and behaviors.

Increased Sense of Risk

This study is about sense of risk within the context of a highly visible and potentially dangerous industry. That context seems ideal for such studies to assist corporate and governmental planning as well as reinforce or alter the plans as they are implemented. In a time when critics caution against communication because it could aid terrorist planning, advocates of effective risk communication need reinforcement that their efforts can lead to an empowered rather than cowed community. To this end, communication has a value unto itself, apart from the utility of information it generates (Hadden, 1989).
Within the past few years some risk communication researchers (e.g., Palenchar & Heath, 2004) have been arguing that the previous risk communication models that utilized sense of risk as a dependent variable – one that should be reduced with communication campaigns – may not in fact be the ideal or actual way this process variable is working in communities.

From an examination of residents' discussions and narratives regarding their sense of risk, it appears that the more aware they are of emergency response measures that are meant to protect residents the more knowledgeable residents are about harms related to potential risks; both possibly playing a curvilinear role in actually increasing residents' sense of risk. "The more information we get, now that we get some of that stuff, though not all of it by any means, but now that I know what to do, I’ve actually become more aware of what’s going on" (GP-OP-37-3). Another resident added that every time they SIP, her sense of risk increases but in a good way (DP-OP-39-2):

We have sheltered in place twice since I have been here, but I rather be alerted and told what to do, but it’s kinda funny but until I went through one [SIP] I never really thought about all this, but now that I do, I feel more prepared but at the same time I feel more vulnerable… maybe ignorance is bliss, who knows.

One resident shared her feelings about seeing Wally Wise at local community events such as a recent store opening (DP-OP-29-4):

I know I shouldn’t feel this way, but I can’t help it, you know when I see Wally, you know that city turtle they use to teach the kids about the environment, it reminds me of what has happened at some of the plants [explosions, leaks] here in town lately… he [Wally Wise] makes me a little nervous but makes me a little comfortable too, knowing that they are teaching the kids, and I guess me, what to do.
Other residents echoed this sentiment, talking about how cute Wally Wise is, what a great educational tool for the children, but at the same time it reminds them of the dangers associated with living in a manufacturing town.

These narratives run against a traditional risk communication principle which argues that more emergency response information provided community residents – in a sense helping to build trust and provide a positive sense of control – should lead to a decreased sense of risk. Though possibly counterintuitive, industry and other organizations responsible for risk management should view this increase in sense of risk as a positive sign that residents are becoming more aware of the potential dangers, are becoming more aware of the appropriate behaviors should an emergency occur, and in general might becoming more vigilant community neighbors. Risk management and communication experts should strive for an aware and vigilant public. By making the information available, even in formats unsuited to making rational risk choices, it still addresses key concerns regarding the imposition of and discontent regarding chemical manufacturing health and safety measures.

Support/Opposition – Separated by a Ship Channel

Throughout the analysis of community risk perceptions in Galena Park and Deer Park, Texas, a variety of differences are apparent (discussed throughout the first three research questions). These differences range from the level of knowledge among residents (much higher in Deer Park though residents in both communities fail to demonstrate any sophisticated knowledge of either the manufacturing process or products being produced); sense of control and trust (differentiated by ethnicity and community); and awareness, knowledge, and behavioral intentions related to risk communication
protocols that residents should follow during an emergency (again, in general much higher level of awareness, knowledge, and anticipated correct behaviors by Deer Park residents).

However, all these variables and more are related to the most common dependent variable studied in risk communication: support/opposition. One of the primary principles of risk communication is the use of sophisticated communication research, strategies and techniques to increase awareness, knowledge and appropriate behavioral intentions for residents in regard to risk management protocols. Previous risk communication research (e.g., Heath & Palenchar, 2000) has demonstrated a positive relationship between emergency information knowledge and industry support. In fact, risk communication studies have frequently been criticized for using communication campaigns to increase support under the disguise of health and safety educational efforts. The difference between the two cities studied is striking in regard to residents' support and/or opposition of the industry.

Near neighbor community residents' support of industry is much higher in Deer Park than it is in Galena Park. Two statements by a resident from each community are typical of the differences exemplified in residents' narratives of living in each community. For one Galena Park Hispanic male resident, the industry is in some sense the devil in disguise (GP-OP-37-5):

I don't like them, I don't trust them, I don't want my children to have anything to do with them... I know, I know, they give us good jobs and schools, whatever you see around here is probably because of them... I take their money but it comes at a cost, whatever that cost is I'll probably find out one day but it ain't good my friend.
This type of comment is consistent with earlier findings that Galena Park residents are less trusting of industry, less trusting of the industry in general and management in particular, and less aware and knowledgeable of emergency risk procedures.

For one Deer Park female resident, the industry is more like that quirky uncle who bothers you a little bit but in general is a nice guy (DP-OP-49-2):

Ha, you say some people here don’t support our plants, well tell them they should just leave… My family, my friends, everyone at church and that I work with supports the industry, everybody, it’s who this town is for heaven’s sake… You take the bad with the good and the good with the bad, just like my husband, but I support him no matter what.

This type of comment is consistent with earlier findings that Deer Park residents are more trusting of industry and management, and more knowledgeable of emergency risk procedures.

Previous research has demonstrated that increased use of strategic risk communication campaigns have a positive relationship with support for industry (e.g., Palenchar & Heath, 2002). This study supports this notion while acknowledging the convoluted nature of this phenomenon. While the increased use of strategic risk communication studies most likely has some impact on industry support/opposition, numerous other variables discussed in this study also play a role in affecting residents’ attitudes toward industry.

Social Justification of Risk

One of the most interesting features of risk perceptions in this study is the notion that residents in both communities are constructing narratives to justify their risk perceptions and behaviors. The risk communication literature is filled with decision-making principles and models that help explain how people view risk and make choices
about which risks are tolerable or bearable in balance with other choices and options. Very little research within the risk communication field (especially from a social theory perspective) has looked at how these residents' justify their choices.

Consistently throughout this study, residents in both communities have spent a large part of their conversational time sharing stories as if trying to justify with a variety of reasons why they have chosen to live and work in either city - in a sense why they have chosen to remain a resident who lives in towns dominated by chemical manufacturing facilities. And uniquely enough, this social justification was not differentiated by city, gender, ethnicity, or even age.

For example, two young women (probably early 20s) talked about why they stayed in Deer Park and started families here. One woman, who moved away for a couple of years after high school but has since returned, talked about all the benefits of living in Deer Park. “I just had to come back, it’s a great town, you wouldn’t know it unless you grew up here... I tried living in Houston but it wasn’t me, you know, if you stay a while you’ll see why, it’s hard to explain” (DP-FG-1-8). But her story and reasons for returning, like many other residents’ interviewed, were delivered in a persuasive manner, at times defensive of their city or at least their reasons why they have chosen to remain there.

Consistently, whether from personal interviews, focus groups, or observation-participation, residents in both communities, even after bad-mouthing the town or industry or government officials, came back with a justification for staying. Whether the reasons are economic (jobs), community (good schools, safe neighborhoods), social (good friends, good neighbors), religious (close to their church), pragmatic (benefits of
small towns) or righteous (bravado risk bearer), residents consistently ended their stories with these justifications.

One Galena Park resident justified her reasons for living in town, even after listing a variety of problems including the corrupt nature of the local government (GP-OP-49-3):

I know it sounds silly – we must sound bad, after spilling our guts out [about all the problems in this town] with you . . . especially after my cop hassling me story . . . but this is my town, it’s a great town for the right reasons, just stick around a little longer and you will understand.

A few residents over the course of the study became somewhat annoyed that they could not effectively explain their reasons for living in either Deer Park or Galena Park (DP-OP-41-4):

It’s frustrating, you all come here everyone once in a while and ask questions. But what you don’t understand is we are no different than any other place . . . except maybe better . . . all you see are all the plants and smell and traffic, what I see is my home . . . you just can’t appreciate it until/unless you live here.

This resident’s statement provides a unique summary perspective. His social justification of bearing risk by living in his home community may be no different than other residents in other communities justifying why they chose the town they live in to call home.

However, for residents who live in communities dominated by the increased risk due to living near major manufacturing facilities, how they construct their justifications for risk can aid in developing more sophisticated and strategic risk communication tools.

Part of this social justification by residents may stem from efforts to construct a positive identity for themselves. J. Thompson (1996) suggested, “As traditions lose their hold in many spheres of social life, individuals are obliged to increasingly fall back on their own resources to construct a coherent identity for themselves” (p. 90). Earlier
identified narratives demonstrated a lack of trust for traditional institutions in these communities, such as trust and sense of control by industry, government agencies, and non-government agencies so individuals are forced to form their own positive sense – justification – for living and working in the communities. “In the absence of clear guidelines from government and science about risk in society today, it is left to the individual to change his or her lifestyle to match their perceptions of the risks involved” (Jones, 2002, p. 51).
CHAPTER SIX
SUMMARY AND CONCLUSIONS

Summary

Risk communication, as an integral part of risk assessment and risk abatement, provides the opportunity to understand and appreciate stakeholders' concerns related to risks generated by organizations. Strategic and ethical risk communication developed from a social orientation works to engage in dialogue to address differences and concerns, carry out appropriate actions that can reduce perceived risks, and create a climate of participatory and effective discourse to reduce friction and increase harmony and mutuality.

Strategic and ethical risk communication requires that community dialogue be a part of formulating emergency response plans prior to being implemented. This dialogue works with and appreciates community residents need to be informed of the plans and to know of the warning systems that will notify them in the event of an emergency, such as the release of a hazardous chemical from a manufacturing facility. Emergency response can be community wide, such as evacuation, or personal, such as staying indoors until the emitted substance has dissipated. Residents want to know what to do in the event of an emergency; such knowledge helps them to control and, therefore, knowledgeably tolerate risks.

Risk communication programs need to acknowledge local citizens' fears and worries. Practitioners can create dialogue between their managements and those
Community relations programs can help practitioners to monitor those concerns by listening to citizens. They should report citizens' concerns to senior managers and encourage appropriate changes in operating performance and communication tactics that can address these concerns and increase the safety and health of community members.

Building trust between industry and community members takes time and requires constant maintenance, performing in ways that do not violate the community's trust. Operating safely and creating effective emergency response teams should increase the public's confidence that the industry shoulders its responsibility to not harm the health and safety of the community. Awareness of this commitment should lead members of the community to be supportive of industry because they feel they can control the actions and policies of the source of risk and the consequences of those actions (Heath & Abel, 1996; Heath, Abel & Douglas, 1996).

Public relations practitioners, including risk communicators, have to understand the actual risk involved, but more importantly people's perceptions of the risks, variables that affect those perceptions, and the communication that results from and subsequently influences those perceptions. "We do not perceive risks, we perceive various features of decision problems and this, in turn, leads to feelings of risk" (Brehmer, 1987, p. 26). For these reasons at least, understanding the dynamics of the risk communication process is a challenging but vital part of the responsibility of organizational management, professional communicators and academics who advocate a risk communication process that is increasingly effective and beneficial to the public who typically bear the risks.
Lessons for Risk Communication and Public Relations Practitioners

A three-part fundamental question within the risk management and risk communication literature is who decides what risks deserve resources, what risks are trivial, and what and how is that communicated to risk bearers? How safe is safe enough and who defines what safe is? In addressing this key concern of risk bearers and risk generators, several lessons-learned points can be drawn from this research project.

The responses to the previous questions depend on the risk bearers' perspectives of the different roles within risk communities and their socially constructed perceptions of risk. If risks are seen as objective measures, the policy implications are clear: order the risks according to objective measures and allocate resources accordingly. However, if the response to this question is viewed as social and cultural, the priorities will reflect the social values and lifestyles of the risk bearers (Bradburry, 1989). A risk communication approach that appreciates and incorporates social constructionist perspectives within public relations efforts can help individuals and groups from lay persons to decision-makers understand, critique, and employ socially constructed value-laden choices.

For risk communication and other public relations professionals, one of the pitfalls to understanding how stakeholders' develop their sense of self through narrative is to rely primarily on their own view of themselves, utilizing organization narratives to describe and influence other enacted narratives. Organizations often fail to realize that the actions by a stakeholder or stakeseecker come to life through enactments by other characters and not just the forceful implementation of their own story (Weick, 1987). As
such, risk communication practitioners must access, decipher, and consider the risk narratives that community members share through community dialogue.

In addition, communication research theory, including interpersonal, organizational, and mass communication, can significantly assist risk communication practitioners during the various stages of planning, implementing, and evaluating community relations programs. An important best practice of risk communication and public relations practitioners is the integration of well-developed theory in grounding risk communication strategies. This research can help practitioners who work within these communities and guide the search for reasons why people are or are not following public risk management advice. It can help pinpoint what risk generators and risk bearers need to know before developing or organizing a risk communication program, and it can provide insight into shaping program strategies to reach people and organizations and make a positive and mutually beneficial impact.

Third, risk communication and public relations research is dominated by survey instruments and other quantitative data collection methods. Though they are often very appropriate and effective, qualitative research designs such as ethnographic case studies can play an important role in helping practitioners better understand and appreciate stakeholders’ concerns. Additionally, key psychometric risk communication process variables such as knowledge, trust, control, harms and benefits, and uncertainty continue to be developed and refined, only to the benefit of the field of risk communication, for both risk generators and risk bearers. A richer description and understanding of cognitive and emotional processes in risk decision making can only improve the development and implementation of risk communication dialogues.
Last, the idea that individuals and communities socially justify risks through narratives merits additional exploration. Risk communication researchers and practitioners need to acknowledge and move beyond an objective orientation toward risk – the idea that there is one understandable and scientifically accepted definition for each risk – and work with and appreciate the social nature of risk roles and risk perceptions. Only from this orientation can effective dialogue become a best practice of risk communication and public relations.

Implications for Further Research

Risk communication, according to Fischhoff (1990), is an important research and best practices topic because key stakeholders, such as activists and the general public insist "on having a role in deciding how those risks will be managed" (p. 84). This emphasis on stakeholders, and relationships with them, has dramatically affected the scope and direction of risk communication research, which continues to mature as a discipline.

Risk communication science challenges communication scholars, especially those involved in public relations and health communication. Some scholars have entered this area of research but many have yet to see this as a unique and challenging discipline. The challenge confronts academics and practitioners of risk communication to achieve a delicate balance. They need to help people to make sound judgments within a community of interest even though technical information is often difficult to obtain, assess, and draw consensual conclusions about, while on the other hand those same people must not lose the sense of apprehension about risks to such an extent that they cannot or do not act to reduce their harm.
One factor that can interfere with appropriate levels of vigilence is a risk communication program that allays key publics' apprehensions – at a time when those apprehensions need to be keen. Risk communication practitioners need to be certain that the overall goals and objectives are not just to gain additional support for the risk generating organization or allay the concerns of community residents and other involved individuals and parties, but rather a constructive dialogue that legitimately addresses risk assessment, abatement, policy, and communication.

This research project and orientation supports Johnson and Covello's (1987) argument that what is missing in the current literature on risk perception is systematic and rigorous analysis of how perceptions and judgments arise from a host of complex factors. This clearly has both theoretical implications in advancing our field of study, as well as practical applications for residents, government agencies, concerned community organizations, and the private industries that are involved in the manufacturing, transportation, or storage of chemical materials and other hazardous products and services.

Overall, a social constructionist approach to risk communication, including the acknowledgment that communities and residents socially justify their perceptions of risk, features wanting to know the dynamics of initiating, creating, sustaining, and even dissolving relationships based on the co-defined sense of what processes lead to positive or negative relationships. As such, terms such as control, power, trust, intimacy, and social exchange are applicable to relationships between organizations and between them and individuals. This work supports interest in symmetry, shared meaning, co-definition, collaboration, positioning, brand (relational) equity, and mutually beneficial outcomes.
This type of research will help lay a more thorough understanding and appreciation for understanding the community perspective of the relationship, and demonstrate the value of public relations to top management – a baseline for community risk perception research. This notion of risk communication supports Pearson’s (1989a) ethical and strategic view of communication as dialogic:

Dialogue is a precondition for any legitimate corporate conduct that affects a public of that organization. The prime concern of those departments is the constitution and maintenance of communication systems that link the corporation with its public – those organizations and groups affected by corporate actions. The goal of public relations is to manage these communication systems such that they come as close as possible to the standards deducted from the idea of dialogue. This is the core ethical responsibility of public relations from which all other obligations follow. (p. 128)

Pearson (1989a) argued that neither objectivism nor relativism is acceptable, reasoning that “it takes two minds to make truth, whether scientific or moral” (p. 121).

Stressing the need for correct information within dialogue on which to base risk assessments, Fischhoff (1985) argued, "The legitimacy of the public's concerns and of the actions that those concerns provoke largely depends on the accuracy of the risk perceptions on which they are based" (p. 84). In this approach, information does not completely account for the final estimation of risk. Culture, values, attributions, narratives, and language of responsibility and self-interests employed in risk interpretations may be more important than technical data, which demands as much if not more examination in future studies as traditional, objectivist perspectives toward risk communication.
APPENDIX A
INTERVIEW QUESTION GUIDE

1. How long have you (and your family) lived here in Deer Park/Galena Park?

2. Can you describe what it is like to live in Deer Park/Galena Park? (Depending on the interview particulars, it may be more appropriate to lead in with an example from my own living experiences and asking if that’s the informant’s understanding.)

3. Do you (and your family) enjoy living in Deer Park/Galena Park, and what do you enjoy and/or not enjoy about living here?

4. Do you have any particular sense of risk living in Deer Park/Galena Park?

5. Do you ever stop to think about what goes on at the chemical plants in town, and if you do, what do you think about?

6. Tell me about your experience, if any, with the local chemical industry?

7. What are some of the major industries/companies in this community?

8. What about other chemical related facilities such as pipelines and railroads?

9. Tell me about your experience, if any, with any of the chemicals or products from those chemical plants that are produced, transported or stored in your community?

10. Does the chemical industry demonstrate its concern for the health and safety of community residents?

11. Does the chemical industry care more or less or the same about some kinds of people who live in the community – their health and safety? Who/what kinds of people?

12. Tell me about your experience, if any, with local organizations that are responsible for addressing health, safety and environmental concerns related to living near the chemical plants? (Depending on the interview particulars, it may be necessary to review a few of the major organizations.)
   - Local Emergency Planning Committee
   - Community advisory committee/panel (CAC/P)
• East Harris County Manufacturers Association (EHCMA)

13. Tell me about your experience, if any, with any types of plans, policies, laws, etc. that you are aware of or knowledgeable about in regard to living near the chemical plants? (Depending on the interview particulars, it may be necessary to review the list of policies and plans that are part of this study.)
   • Responsible Care
   • Toxic Release Inventory (TRI)
   • Superfund Amendment Reauthorization Act of 1986 (SARA Title III)
   • Clean Air and Water Act
   • Risk Management Plan (RMP)
   • Community Awareness and Emergency Response (CAER)

14. Are you aware of any of the emergency response measures or emergency response systems that you (and your family) should take and/or listen to in the event of a local emergency related to living near the chemical plants? (Depending on the interview particulars, it may be necessary to review the list of risk management measures.)
   • Shelter in place (including schools) (SIP)
   • CAER Line
   • Neighborhood Early Warning System (NEWS)
   • First Call System
   • Plant siren
   • Municipal sirens
   • Vehicle sirens or public address systems
   • Low-power AM radio stations
   • Emergency Alert System (EAS)/Public Information Emergency System (PIES)
   • Media Alert Notification System (MANS)

15. Tell me about your experience, if any, with any types of communication, public relations or advertising materials for example, that you are aware of or knowledgeable about in regard to living near the chemical plants? (Depending on the interview particulars, it may be necessary to review the list of risk communication tools.)
   • Wally Wise Guy
   • Videos
   • Posters and fliers
   • Shopping bags
   • New resident packages
   • Media Reports
   • Websites
16. Do you trust the chemical industry (why/why not)? Do you trust what they do and/or what they say for instance?*

17. Do you trust the city? Any other types of organizations?*

18. Do you feel a sense of control over the health and safety aspects of you and your families’ lives related to living near chemical facilities?*

19. Do you feel that industry or other organizations, including the city government, has a sense of control over the industry and over the health and safety aspects of you and your families’ lives related to living near chemical facilities?*

20. Anything else you would like to add or say at this time?

*Questions 16-20 were added part way through the interview process. These themes were not identified during the initial phases of observation-participation but indirectly developed in early personal interviews. The researcher felt the topic deserved more specific questions related to the topic of trust and control and added them throughout to the remainder of the research instruments.
APPENDIX B
FOCUS GROUP QUESTION GUIDE

Community

1. How long have you all (and your families) lived here in Deer Park/Galena Park?

2. Can you describe what it is like to live in Deer Park/Galena Park? (Depending on the interview particulars, it may be more appropriate to lead in with an example from my own living experiences and asking if that’s the informant’s understanding.)

3. Do you (and your family) enjoy living in Deer Park/Galena Park, and what do you enjoy and/or not enjoy about living here?

4. Are there any kinds of benefits and/or harms related to living specifically in Deer Park/Galena Park?

Industry

5. Tell me about your experience, if any, with the local chemical industry?

6. What are some of the major industries/companies in this community?

7. What about other chemical related facilities such as pipelines and railroads?

8. Do you ever stop to think about what goes on at the chemical plants in town, and if you do, what do you think about?

9. What role does the industry play in your lives? Does the industry benefit you, your families and other members of the community?

10. Does the industry harm you, your families and other members of the community?

11. Does the chemical industry demonstrate its concern for the health and safety of community residents?

12. Are you worried about your health and/or the health of others in the community because of the presence of the chemical industry?
13. Does the chemical industry care more or less or the same about some kinds of people who live in the community – their health and safety? Who/what kinds of people?

14. Tell me about your experience, if any, with any of the chemicals and products from those chemical plants that are produced, transported or stored in your community?

Organizations, Safety Measures, Risk Communication Tools

15. Tell me about your experience, if any, with local organizations that are responsible for addressing health, safety and environmental concerns related to living near the chemical plants? (Depending on the interview particulars, it may be necessary to review a few of the major organizations.)
   - Local Emergency Planning Committee
   - Community advisory committee/panel (CAC/P)
   - East Harris County Manufacturers Association (EHCMA)
   - City groups such as emergency personnel such as police and fire, medical, environmental, mayor’s office and staff.

16. Tell me about your experience, if any, with any types of plans, policies, laws, etc. that you are aware of or knowledgeable about in regard to living near the chemical plants? (Depending on the interview particulars, it may be necessary to review the list of policies and plans that are part of this study.)
   - Responsible Care
   - Toxic Release Inventory (TRI)
   - Superfund Amendment Reauthorization Act of 1986 (SARA Title III)
   - Clean Air and Water Act
   - Risk Management Plan (RMP)
   - Community Awareness and Emergency Response (CAER)

17. Tell me about your experience, if any, with what the city does to help protect you and other residents in the event something bad happens at one of the plants?

18. If there was a chemical plant emergency, what emergency response would the city take to protect citizens?

19. If there was a chemical plant emergency, what emergency response would the industry take to protect citizens?

20. Are you aware of any of the emergency response measures or emergency response systems that you (and your family) should take and/or listen to in the event of a local emergency related to living near the chemical plants? (Depending on the interview particulars, it may be necessary to review the list of risk management measures.)
• Shelter in place (including schools) (SIP)
• CAER Line
• Neighborhood Early Warning System (NEWS)
• First Call System
• Plant siren
• Municipal sirens
• Vehicle sirens or public address systems
• Low-power AM radio stations
• Emergency Alert System (EAS)/Public Information Emergency System (PIES)
• Media Alert Notification System (MANS)

21. Tell me about your experience, if any, with any types of communication, public relations or advertising materials for example, that you are aware of or knowledgeable about in regard to living near the chemical plants? (Depending on the interview particulars, it may be necessary to review the list of risk communication tools.)
  • Wally Wise Guy
  • Videos
  • Posters and fliers
  • Shopping bags
  • New resident packages
  • Media Reports
  • Websites

22. Do you think the city, industry and/or other types of organizations do a good job of communication potential health and safety problems related to living near chemical facilities?

Trust and Control

23. What does the term “trust” mean to you? Do you trust the chemical industry (why/why not)? Do you trust what they do and/or what they say for instance?

24. Do you trust the city? Any other types of organizations?

25. What does the term “control” mean to you? Do you feel a sense of control over the health and safety aspects of you and your families’ lives related to living near chemical facilities?

26. Do you feel that industry or other organizations, including the city government, has a sense of control over the industry and over the health and safety aspects of you and your families’ lives related to living near chemical facilities?

27. Anything else you would like to add or say at this time?
APPENDIX C
UNIVERSITY OF FLORIDA INSTITUTIONAL REVIEW BOARD
INFORMED CONSENT RELEASE

CONSENT TO PARTICIPATE: PRINCIPLE MEMBER

My name is Michael J. Palenchar and I am a doctoral student in the Department of Public Relations at the University of Florida. I am doing a research study of people who live in manufacturing-based communities. I am interested in how people perceive their roles as community residents via narratives, and what meanings this experience holds for them. My work will be supervised by my professor, Dr. Linda C. Hon, associate professor of the College of Journalism and Communications. It will be used to fulfill partial research requirements for my degree.

You are invited to participate in this study. If you agree to participate in this study, I will interview you on at least one occasion. The interview will be scheduled at your convenience and conducted at your home (or other location that is agreeable to you). During that interview, which will last approximately thirty minutes to one hour, you will be asked to talk about what it is like to live in Deer Park and what meanings this experience holds for you. Any subsequent interviews will be scheduled with you at your convenience. If needed, a follow-on interview would be conducted to clarify specific thoughts and comments from the original interview. You will not have to answer questions you do not wish to answer. Although the interview(s) will be audio-taped and combined with interviews of other residents, the tapes will be coded so that your privacy is protected. The code sheets and tapes will be kept in secure storage at the University of Florida and will be erased within one year of completion of the project. Only Dr. Hon and I will have access to these tapes and their codes and transcriptions. These interviews will be kept confidential to the full extent provided by law.

The interview data will be combined with other interviews so that specific information will not be tied to you or your family. When the report is completed, you will have the opportunity to see it and discuss it with me if you wish. My hope is that this research will benefit you in seeing how your experience compares to other residents. It may also better inform public relations practitioners on the community relations experience as they develop, review and strategies, tactics and policies in this area.

If you have any questions, you may contact me or Dr. Linda C. Hon in the College of Journalism and Communications at 352-392-6522. Any concerns about your rights as a participant may be directed to: UFIRB Office, Box 112250, University of Florida, Gainesville, FL 32611-2250; ph 352-392-0433. Your decision to participate or not participate will not prejudice your relations with the University of Florida in any way. If you decide to participate, you are completely free to withdraw consent and discontinue participation at any time without consequence.

I agree to voluntarily participate in the study of people who live in manufacturing-based communities. My signature indicates that I have read the procedure described and I have received a copy of this description. I voluntarily agree to participate in the interview procedure. There are no anticipated risks for me. I will not be compensated for participation. I do not have to answer any questions that I do not wish to answer, and I may withdraw my participation without prejudice at any time after signing this form.

Participant: ___________________________ Date: _____________

Investigator: ___________________________ Date: _____________

I would like to receive a copy of the final “interview” manuscript. ______
APPENDIX D
SAMPLE INTERVIEW TRANSCRIPT

Deer Park Personal Interview (Hispanic, female, young professional)
October 23, 2005 – 11:00 AM
Researcher: Michael J. Palenchar
I = Interviewer; R = resident.
Names of residents, families and friends have been replaced with pseudonyms in the following transcript in the interest of privacy.

I: First of all, how long have you and your family lived in this area?
R: Twenty-one years.
I: Twenty-one years. Great! Can you describe what it is like to live in Deer Park?
R: What do you mean exactly?
I: Well, for example, I have lived here just a couple of months. I have found Deer Park to be a very friendly-type of community, that type of description, good, bad or neutral, but with more detail if you can provide it.
R: That's a hard question to answer, let me think about this for a minute. I grew up here, to me this is my home, I know everyone, it's just home for me.
I: Okay, so how do you like living here?
R: I love it.
I: You love it. What do you love about living here?
R: Um, it's small, it's a small town that's growing. It's kind of like everyone knows everybody.
I: Okay.
R: I love it. It’s, everything’s right here.
I: Everything’s right here. What do you mean by that?
R: Um, just... I don’t know. It’s where I love driving down Center Street. ‘Cause you see, I don’t know... It’s like you see all these people and all my friends are there, all my old school friends. And, I mean, everyone I’ve grown up with. I mean we always run into each other. So, I mean, I really, I enjoy living here.
I: Do you plan to stay here?
R: Oh, I moved away once, for a year and I had to come back.
I: Okay, great. Let me ask you, do you have any particular feeling or sense of risk, particular to this town, about living here?
R: Do you mean, “Am I scared of the all the plants and stuff?”
I: Whatever you think of when you think about risks associated with living in Deer Park.
R: I guess I don’t think about anything in particular.
I: Okay, do you stop to ever think about what goes on at the plants around you?
R: Oh yeah. Oh yeah.
I: What do you think when you think about that?
R: Oh, I wonder... What I mostly think about is like the safety stuff. There might be explosions. And ever since 9/11, you know, target-wise. I mean, it may sound corny, but that’s what I really think about. And then, a couple times there have been a couple of accidents not exactly right here, but.... You know little explosions that shouldn’t have happened. People getting hurt and there’s fire. I have a resident, he’s an EM, a firefighter at Exxon. And there was a fire there
right when we first met and one of his friends... He'd gotten hurt, had caught on fire, and we ended up having to attend a funeral for him.

I: Oh no, I'm sorry to hear that.

R: So, I mostly, I think about like the safety and stuff. And I also think about the - they were bringing that, on trains, it was that... Some kind of, it was really dangerous... What was it called? It starts with an N. Napal... No, I don't know, it was a chemical that they were gonna use.

I: Alright, interesting. Do you think about the plants here in Deer Park separate from all the other plants in the area or do you kind of think of them all at once?

R: I really consider the ones on 225. Lining up from 225 to like 146. That's where I stop. I really... I think of those mostly and then. I really just think of those, and then every once in a while, the ones over here.

I: Do you think of any other parts of the industry? Do you think about the pipelines or all the trucks carrying stuff?

R: Oh, yeah. Oh yeah, I do think of that. They're always on the freeways. And, driving and you hear a lot about accidents a lot, and spills. Like oil spills, in the gulf and stuff. And the animals. And then the wrecks with like the 18 wheelers on the road. On the freeway, like dropping their load and stuff like that. It always worries me because my mom has to drive so far every day.

I: Okay.

R: And I'm thinking "oh my gosh", you know, stuff like that. I think about a lot of stuff.
I: Okay, are there any other things related to risks of living in a community like this with lots of plants that you think about? Or is that pretty much it?

R: Pollution.

I: Pollution? What do you think about the pollution?

R: I don’t think it’s getting any better. I think that it’s gonna get worse before it gets any better. And I think about what I’m inhaling when I go outside. What my kids are gonna be like, stuff like that. And if it really ever is gonna get better. I mean they always say “okay.” Well they lowered the speed limit so it will lower the risk of pollution and come out with all this stuff that will help. But it really does not work. In my thoughts.

I: Thanks, that’s exactly what I want to hear, your thoughts, thanks. Do you think that the chemical plants and the chemical companies, do you think they demonstrate their awareness? Do you think they are aware of the citizens’ concerns for about these kinds of issues?

R: I think certain ones do. I don’t think all of them do. That’s just my personal opinion. I don’t know those people… I mean, it’s just something, I don’t know, something I feel inside. There are certain ones out there who they really do care and they want to make a difference but then again, I think there are some other people that they don’t want to. (Car horn beeps)

R: Oh, that’s my neighbor.

I: So you do think – do you think that the industry is maybe more responsive to certain people in the community as opposed to other kinds of people in the
community? Do you think they differentiate at all in how they communicate and how they work with the community?

R: I don't really know. I mean, I think, I think certain people in the community do that aren't in that business, and they voice effort. I think they try and work out certain things with certain people, maybe not everybody.

I: Okay.

R: Kind of like one of the favorite – like a favorite thing.

I: Okay, great. Let me ask some things about the industry being here in town. What are some of the industries that are located right here?

R: Industries? Like, um...

I: Yeah, companies, the big companies around here.

R: Oh. Of course, the plants.

I: Yeah, do you know any of them, who they are?

R: There's Shell. Um, oh gosh, there's Shell. What else is there? There's a lot on 225. I know the names of, it's just... they're right there. I know where they're at.

I: Okay, that's fine, take your time.

R: One starts with a C. I mean, and I'm also familiar with the ones right here on... on Fairmont. Like Dayport, um, Lawndale. I mean, all over, I know a lot of people that live there.

I: Okay, let's talk about some of the products that are manufactured here. Do you know about the products that are made at the plants?

R: Um, honestly, I don't. I really don't.

I: Okay, do you know any people that work in the industry?
R: I do know a couple people.

I: You do. Have you been here when there have been incidents in the area with the chemical plants? Have they communicated with you? How have you felt about that communication?

R: They do their communication with, um, the 530 channel. 530 AM. I learned it when I was in elementary – that Wally Wise thing. And then, a couple times when I was in school, we had to turn off the air conditioning, lock the doors and we had to stay inside. One time we had to stay inside. We couldn’t leave school because there was a leak or something.

I: So if you’re at work. Let’s say that you’re at work here today and you hear the siren or something like that. What are you supposed to do?

R: Do not go outside. That siren. And they do the tests every Thursday of the month at 6:30.

I: 6:30 every Thursday?

R: Every Thursday, the first Thursday of the month.

I: Okay.

R: So, I mean, that is another thing that they do that warns people.

I: Okay, do you know any of the other… How else does the industry communicate with the community residents about what to do and…

R: I know that… Sometimes they have like, I’ve heard of like the fire station putting on or yeah, like putting on meetings. And, like, little helpful ways and they always send you something, like what to do. Like steps you need to take if something like a disaster was to happen.
I: They send it to you how?
R: Like, um, you... I don't know. Sometimes they're like what is on that table right there. Just stuff you can pick up. You know if you're interested.
I: Like flyers or something like that?
R: Flyers and stuff like that.
I: What other things have you seen? Have you seen any of the other communication tools that they use?
R: Um, no.
I: No, okay. So, that's a lot. You've seen a lot of them, though. Let me ask you some questions about some other things. Do you know what an LEPC is?
R: I see those, I see them in my head. I just don't know.
I: Okay. Do you know what the CAER Line is?
R: No.
I: Do you know what the First Call System is?
R: First Call?
I: First Call System.
R: No.
I: You do know who Wally Wise is, you mentioned Wally?
R: Oh God (laughs). He's that turtle that gives you all those hints, like listen to your radio, stay inside, turn off your air conditioning. That is what they send out to the schools. And then, he's in like all the calendars.
I: Do you think that a lot of the people, and not just the kids, but as an adult and older people, do you think they know what to do because of Wally when they were kids?

R: Um, certain… I know certain people do. You never forget what you learn in like elementary and stuff. Like certain events and stuff. I think if I can remember it, mostly a lot of people have.

I: Okay, alright, let’s talk about the city. The city council, the city government, etc. Do you think they’re concerned about the issues related to having all the chemical plants in the area?

R: I think they are, but I don’t think they do much about it.

I: Do they do anything to help kind of protect the citizens here?

R: You know, honestly, I don’t know. If they do, they don’t really make it public. They kind of keep it to themselves.

I: So, from your perspective, the industry does more to let people know what is going on out there than the government does.

R: I would have to say so.

I: What about the police and fire department?

R: The police and fire department, they just… They always try and help you in whatever way they can. They just try and give you tips. I mean, I know so many of them and they… any… they help you. They try and give you tips on how to protect yourself and stuff like that. And they also go out to the schools. I remember having assemblies. A one hour assembly and so many people would talk to you.
I: Let’s move on to talk about any policies or laws that you might be aware of or knowledge about that have an affect on you, or are intended to have an affect on you, related to your health and safety living near chemical plants? Can you think of anything?

R: Not really. I’m sure, uh, they have lots of laws, I just don’t know them.

I: Okay, have you ever heard about Responsible Care?

R: No.

I: You let me know if you have heard about any of these: Toxic Release Inventory, SARA Title III, Clean Air and Water Act, Risk Management Plan? Anything sound familiar?

R: Sorry, no, wish I could be of more help.

I: That’s perfectly fine, remember, this is about what you think, there’s no right or wrong answer and I am not looking for anything in particular. One more, how about Community Awareness and Emergency Response?

R: No again, sorry.

I: OK, let’s change this up. Let’s talk about trust for a moment. Do you trust the industry to tell you what is really going on there?

R: No.

I: Do you trust the industry to tell you when there is an incident or an accident at the plant?

R: Uh, about 50/50. Because sometimes the news people get to it first.

I: Do you trust the media to tell you what is going on over there?
R: I don’t trust the media! They bring you the story. But about getting all the facts and stuff... There is always... no one is gonna get all the... only the things that it happened to or the one’s that know what happened – they have all the facts. Not the media, not the news people, they just hear about it and then they bring a story of it. The industry knows all the facts, but not what happened.

I: Do you trust the government to tell you what’s going on?

R: No.

I: Okay.

R: It’s, I’m very... I don’t know. It’s hard to like... I don’t know. You’re concerned with all this stuff and it’s hard when you say you don’t trust your government. I’m just one of those people. I haven’t been persuaded to trust.

I: Do you... Do you trust yourself in this situation? Do you feel like you have some control over all of this?

R: I don’t, honestly, I wouldn’t think so. I just, I know what I can do to protect my family from stuff like that. Obviously, I can’t protect them from everything, no one can. I just know that I’ll know how to um... when they’re grown up... what to beware of, what to look out for... You know? Just little helpful tips, tips that will help them through life.

I: Have you heard of the term “shelter in place” then?

R: Yes, that’s like... Stay right where you – I’ve heard of that, they teach you that in school. That’s basically, you’re staying right were you’re at. If you have to, get under a desk.

I: When you were in school here, did you go to Deer Park High School?
R: Yes.
I: Did you ever have an incident where you had to shelter in place at the high school or the junior high?
R: I wanna say we did, but exactly what year or what day I don't remember. But I remember something had happened where we had to lock the doors and stuff like that. I just don't remember it.
I: Did the parents show up or anything, or did the kids...?
R: I was stuck in the room.
I: (Laughs.). Okay.
R: I know that.
I: Are you aware of any activist groups, not government groups, and not industry, but any other groups in the community that are active in trying to...?
R: If there are, I haven't seen them. Or I haven't heard anything from them. That's one thing... I never hear of any of that stuff here. Like protesting or anything like that. I don't know if I don't get out much or what. But I haven't heard of anything like that.
I: Do you think that it could be possible that part of the reason is that people like living here?
R: That could be a possibility. I enjoy living here by all means. I just want it to be a safe place. I just, I'm just worried about stuff like that.
I: But even though you're worried about stuff like that, you still love it. And you don't want to move? You want to stay here?
R: Unfortunately, yeah. It sounds bad.
I: No, no, no. Why did you say, why did you say unfortunately?

R: I mean, it sounds like I really don’t care... I mean I don’t care what I’m doing to myself. And they could not... There’s a possibility they aren’t doing anything wrong. They could be taking all the measures to make the environment as safe as they can. But I’m just one of those people. You have to persuade me for me to believe you. You know?

I: That it isn’t bad?

R: Yeah, yeah. You have to show them that you are honestly... that it’s... the pollution, and the air is right enough for us to intake. I mean, you have to persuade me. You have to really show me. Other than that, I’m not going to believe you. (Laughs.) But, as far as living here, I mean, leaving here. I don’t think I’ll ever leave. I’m one of those people... if I know someone, I’m gonna, I know people, I’m gonna stay. I’m not gonna be a big, be a small fish in a big ole’ pond.
Deer Park Focus Group (Anglo, female gender – young adults)  
January 18, 2005, 2:00 PM  
Researcher: Michael J. Palenchar  
I = Interviewer, R = resident, Rs = multiple residents with similar responses  
Names of residents, families and friends have been replaced with pseudonyms in the  
following transcript in the interest of privacy.

I: First of all, how long have you and your families all lived here?

Rs: All my life... All my life... Me too, all my life except for a couple of summers  
after high school.

I: How about the rest of you all?

R: Same here. (Other general agreements.) I moved here about ten years ago but I  
pretty much consider this my only home, this is where I tell people I meet where  
I'm from.

I: Pretty much all your life, okay.

R: Seventeen years. Seventeen years and a year in Pasadena.

I: In this general area. So, you’ve lived here all of your lives. Okay, great. How do  
you like living in Deer Park? I mean, can you describe what it’s like to live in  
Deer Park.

R: I like it.

R: I like it because I know everyone.
R: Other than that... allergies. (Laughter all around)

R: I have a lot of allergies.

I: What do you think about when you think about Deer Park and your home town?

Do you think about anything?

R: The kids.

R: I think about all the bad teenagers.

I: You think about all the bad teenagers?

R: No, just the place where I lived in Pasadena. I don't know. Just certain parts of the place stink. When I think about what other people think about it... It's like Stinkadena.

I: Stinkadena? (Laughs.)

Rs: Yeah... Yeah.

I: Is there an acronym like that, or a slogan like that for Deer Park?

Rs: Snobs... Snobs... Snobs.

I: Why snobs?

R: That's more like when you're in school.

R: Like high schools. They know you're from Deer Park by what you wear.

R: How you talk.

I: Because it's a higher class city, or what is it?

R: Well, it shouldn't be.

R: They shouldn't think that.

R: I don't really think we are, but people think that.

R: Did you see that shirt? We're Deer Park snobs and we know we are?
R: Yeah. (Laughs.)

I: Okay. Do you like living here? Why do you like and don’t like about living here?

R: I grew up here. I know everybody here.

R: My whole family’s here.

I: Your family is here. Do you want to stay here or do you want to move?

R: I want to stay.

R: No. I mean, I say I don’t want to stay because, I don’t know, I’d rather move to a more open area by the water or something but...

I: Okay, how about yourself?

R: (Response unintelligible.)

I: Are there any kinds of benefits or harms from living in Deer Park?

R: I guess you could say, like jobs. My brothers all work at the plants, even my brother Randy who went to UT, came back here right after and started working for Shell. Yeah, and most of his friends did too.

I: What about some of you others, any benefits or harms related to living here in Deer Park?

R: Like we said, the asthma is just terrible. I go to San Jacinto College now, and it’s like all through the classes, people coughing and blowing their noses and stuff like...

R: Absolutely, I have had, I even take over the counters for it.

R: So do I but I’m not sure if that’s just here, all my friends from all around here have asthma and stuff.
I: OK, I know we have a short period of time so let’s move onto talking about the chemical industry. Tell me about your experiences, if you have had any in the past or recently, with the local chemical industry?

R: Well, we probably all have family who have worked for at one time or another someone around here. My dad drove trucks for them for a while but I don’t really have any direct experiences. (General agreement by nodding that these residents do not have direct experience with the industry.)

I: Yes, in that area. Okay. Let’s talk about some of the industry here in town. Do you know any of the names of the plants in Deer Park?

Rs: Shell... Shell.

I: Okay, anybody else?

R: You know, I know the name because they’re always on the news about explosions and...

I: Who is it?

Rs: Shell... Shell.

R: There is Lawndale...

R: Linedale.

I: Linedale. (Laughs.) Do you ever stop to think about what goes on at Shell or the other plants?

Rs: I don’t know what goes on... I have no idea.

I: No idea?
R: I know a little because one of my friends, over the summer, used to work at one of the plants, so he would tell me what he would do. Just like, “a bunch of chemicals.” (Laughs.)

R: Well, they play with not play with, they work with them and everything. So if you do something wrong, something is gonna happen.

I: Any sense of concern about living next to the chemical plants?

R: Yeah.

I: Yeah, what kind of concern?

R: Something might blow up.

R: Yeah!

I: That it’s going to blow up?

R: Yeah. I had a friend that actually, it has blown up before and it blew out their windows. And then, the other time it blew up, it broke their foundation so the chemical plant had to repair it and repay everybody in the neighborhood.

R: I think that there should be a law about how far away they should be.

R: Exactly! I mean, because there’s a law about how far away… This may sound unimportant, but how far away you have to be from wild animals, you know. Like to have a home. There should be a law against chemical plants, that’s what I think, to start a neighborhood especially, or to build a home, especially where children are around.

I: Okay.

R: (Response unintelligible.)
I: Speaking of laws, are any of you familiar with any laws or policies meant to protect your health, safety and environment related to living in a town with chemical plants and other similar facilities?

Rs: No... No...

R: I think we studied some in school, but I can’t remember anything specific. Isn’t there some clean air or water thing, they have been talking about that in local newspaper a lot lately, like they are changing some of the rules or something, but I couldn’t explain it you if you wanted me to.

I: Okay. Do you think about some of the other things related to the plants? Like trucks carrying cargo and the pipelines through town. Do you think of storage tanks or anything like that? Do you worry about or think about that? Do you care about it either way?

R: Yeah.

R: What do you mean? Like, them on the freeways?

I: Yeah.

R: Oh yeah.

R: I do.

R: She needs to.

R: Yeah, today I saw a guy that kept on swerving.

R: Some of them are careless. Some of the drivers are. You see and hear about all those accidents. He almost hit us.

R: We were actually coming back from Louisiana, going back to Texas and the people that were leaving Texas... There was a wreck and an eighteen-wheeler... a
Mustang was underneath it. It had completely driven over it and the wheels were stuck on top of the mustang.

I: Oh, no. (Laughs.)

R: And I was like, “Oh my goodness!” All those huge trucks, they are crazy, they don’t care about us little cars.

I: Alright, do you see any benefits of living next to the chemical plants? And living in this town with the industry here?

R: Benefits? I don’t.

R: No.

R: Jobs.

I: Jobs, okay.

R: That’s what I just said. Jobs.

I: Okay. Do you think the chemical plants care about the people who live in town? Like health and safety?

R: To a certain extent.

R: Yeah, exactly.

I: They do. To a certain extent? What do you mean by…

R: Just like… They won’t… You know….

R: I think they care, but they have to care, you know.

I: Why do they have to care?

R: Because everyone complains. They don’t want to be on the news all the time with everyone talking down about it.
I: Do you think the government cares about what’s going on with the residents and the plants?

R: Yeah.

R: To a certain extent.

I: Same reason? Same thing?

Rs: Yeah... yeah...

I: What do you think?

R: I probably would, because if not, and everyone keeps on complaining... that’s a lot of money that they have to pull from the company’s money.

I: Let me ask you, do you know anything about the products that the plants produce?

Rs: No... Not really... Oil... Do they?

I: Sure. Yeah.

R: Like plastic.

I: Plastics?

R: Yes! Solvay.

I: Solvay. Solvay is what?

R: You remember that time we took that field trip to Solvay and they introduced those little pellets. And like...Hold on, don’t look at me! (Laughs.) Um, they um... It’s not really men working on stuff anymore. It’s so high-tech that it’s computers doing everything at once. Like plastic, Solvay is a plastic factory, right?

I: Very good. (Laughs.)
R: See. School sticks in my mind.

I: Do the plants, the industry spend much time communicating to you about what they do and what’s…

R: No, not at all.

I: No? Let me ask you a question. Are you aware of any of the communication tools, such as advertising, that either the industry or local government or anyone else uses to let you know about health and safety cautions in the community?

I: No… Not really… I think I’ve read about some stuff before but don’t really know anything.

R: Do you know who Wally Wise Guy is?

R: Yeah.

R: And every Thursday, they have an alarm. Every first Thursday of the month.

I: They have the what? They have the…

R: The alarm.

I: They have an alarm. Alright. And you said Wally Wise is who?

R: He’s the shelter in place character.

R: Shelter in place, yeah.

R: I had a picture made with him last year.

I: What other things have you seen like that? Like shelter in place, and you mentioned the calendar.

R: Calendar, yeah.

I: What other things are out there educating the community about what to do in an emergency?
R: I don’t know.
I: Anything else you can think of?
R: Not out of the school. That’s about it.
R: School. That’s about it, yeah.
R: Oh, is that where you have to go in case anything happens?
I: What does shelter in place mean? You used the term. What does shelter in place mean?
R: Stay in one place.
R: Well, it’s like… I don’t know.
R: Be in a safe place whenever either something like chemically, maybe or…
R: Don’t go out into the open or weather or anything.
I: Okay, don’t go out into the open, stay in place. Anything else does it mean to you guys? Just stay in place and don’t go out?
R: Yeah, because we had to do that in high school one year. One of the chemicals blew up, so we all had to go towards this other place. And we just sat there. And we couldn’t get into our cars because they were afraid of the fumes and everything. And one of my other best friends, she went to Pasadena high school. So she was right there between 225 and where the chemical plant was. And they couldn’t leave until six o’clock that evening, until everything was set.
I: Have you ever seen a video that informs the town about what to during an emergency?
Rs: No… No…
I: No? Okay. Do you know what the LEPC is?
R: That’s on a calendar! (Laughs.) I saw it on…

R: Isn’t it like… I don’t know what it stands for, but…

R: It’s on my calendar.

R: I know it’s like emergencies, or something. I don’t know.

I: Do you know what they do.

R: No.

I: Do you know what the CAER line is?

R: No.

R: That’s that other thing.

I: What is?

R: I don’t know what it stands for! (Laughs.)

I: That’s why I’m asking these questions. Remember, there are no right or wrong answers, I just want to know your opinions and thoughts and what you know.

R: I know it’s like safety stuff.

I: It’s about safety stuff.

R: Yeah.

I: Does Wally ask you to do anything else besides shelter in place?

R: Listen to 530 AM.

R: Yeah.

I: Listen to 530 AM. Did you know that?

R: No.

I: Half the people here knew that, right? Half? So you knew it at some point?

R: I used to know it. (Laughs.)
I: You used to know it? Okay. (Laughs.) Do you ever hear... Does the city, the mayor or the local government, do they ever talk about what to do in an emergency?

Rs: No... No...

I: No? Are there any activist groups here? You know, groups that are concerned about the health and safety of the environment? That you are aware of? That lets people know what to do about health, safety and the environment?

Rs: No... No...

R: If there are activist groups, we don’t know about them. I think what we know about activists groups is that we have to see them stand and protest it on the side of the road, for us to know about it.

I: Do they ever protest here?

R: No.

R: One time, they had protests at Wal-Mart.

R: Is that what it was?

I: At Wal-Mart? (Laughs.) For what?

R: (Response unintelligible.)

R: Something for Kroger’s employees.

I: Have you heard of the First Call System?

R: No.

I: First-Call-System. No? That’s alright. Have you heard of SIMA before?

R: Nope... Nope...

I: Have you seen any of the emergency magnets for your refrigerator?
R: Yeah.
I: Yeah? What did it tell you to do?
R: Stay inside.
R: Turn off air conditioners. Shut all windows.
I: Do you ever see any advertisements or anything in the media? The newspaper, the fine Deer Park Messenger or anything else like that?
R: I bet the newspaper.
R: Probably in the Deer Park Messenger.
I: Okay. Do you see signs anywhere? At parks or schools or anything else about what to do?
R: Maybe near school.
R: Yeah, near school.
I: Let me ask you this: Do you think the industry does enough to protect the local residents’ health and safety issues?
R: I think so. We haven’t really had any...
R: Well, see… No, I mean yeah, we haven’t had anything wrong… But if something were to go wrong, they’re not used to it because it hasn’t happened in a long time. So, probably not.
I: Okay, do you trust the industry?
R: No.
R: I never really thought about it, but no. I don’t know.
R: Not really. (Laughs)
I: Do you trust the government to tell you and help protect you and stuff like that? Your local government?
R: No.
I: Do you trust the fire department and the police department to help you out?
R: Yeah, I do.
R: Deer Park is really, really straight. Really straight.
I: Okay.
R: I know some of the firemen now, and the EMT’s. They are so sweet. I know that they wouldn’t try and hide anything from me. Because they have families too that live here.
I: Yeah.
R: So I think that makes a big difference. If you have family living where you live.
I: Do you think the people who work in the industry have family? People who work in the plants and live here?
R: Yeah. They just don’t care. (Laughs.)
R: See, that’s like one of the hardest questions.
I: Why?
R: It is... I don’t know...
I: Okay. Have you heard of community right to know?
R: No.
R: Community right to know?
I: Yeah, the term community-right-to-know.
R: I heard that before.
I: But you forgot it? (Laughs.) But you have heard of it?

R: I have heard people say that before.

I: Why do you think… Let me go back to one of the questions earlier. You guys said something about the snob t-shirts and stuff like that. Why do you think people like Deer Park?

R: Because it’s small.

R: It’s small, yeah.

R: But sometimes, it can be judgey. But…

R: You know Deer Park. They’re open to everyone. But if you’re an out-of-towner, they’re not gonna be like “no, get out”. You know? Like most cities are.

I: They welcome you here?

R: Yeah, they’re very welcoming.

R: If you was born and raised in Deer Park, you will be comfortable in Deer Park for the rest of your life.

R: But if you come in from outside, you will not feel comfortable.

R: I just said you would! (Laughs.)

R: I mean they’re welcoming…

R: But some people aren’t.

R: You have to fit in.

R: Well, I came from Pasadena, so… like at Rayburn, a lot of people did judge Deer Park. But…

R: I don’t think that’s true.

R: (Response unintelligible)
I: What did people in Pasadena think of people in Deer Park when you were living there?

R: They think that... It’s mainly high school... Once you get out of school, no one really cares. They’re just not grown up. They gotta get a life.

I: So, ultimately, you like living in Deer Park?

R: Well, yeah.

I: Well, is this correct, you said you like living in Deer Park?

R: Only because I’ve never lived anywhere else.

I: Sure. Your friends are here, your family’s here. And you don’t really think too much about what’s going on with the industry because nothing’s really happened lately for you to think about it. Do you think if something does happen...

R: I think I would think about it a lot more if I had a family of my own.

I: For yourself, you don’t think about it?

R: Yeah, I mean that sounds bad because... I just think that that’s the way I am. If something was to happen and I honestly had a family, I think if I could afford it, I would be out of here. I want to say. But then again, I might not be. So...That’s just the way I am.

I: Okay. Anything else you could add about living in Deer Park? Would you like to add anything being that I’m totally new to Deer Park? (Laughter.)

R: What’s it like hanging around us?

R: Are we snobs? No, I mean I go all over the place, but I stay mainly on the port, though.

R: Yeah, she... the port’s not a very good place either.
R: I mean, I like the port.
I: You do like the port?
R: Yeah, I think it’s nice. There’s no chemicals. No, there is, actually.
R: It’s all down 225. All down 146.
R: From the middle of Fairmont to, um, 146 again.
I: This is part of life?
R: You can’t get away from it. We’re used to it.
R: Yeah, we’re so used to it, I mean… Like, once I go out of town, I can breathe so good. And then, once I come back, I just feel like I get so sick.
R: That’s how my friend is. When she goes out of town, she gets really sick, like in clear air. And when she comes back in town, she feels so much better because she would be really sick because she’s used to all the pollution and all the chemicals and everything.
I: So you have all this pollution. It’s in the end, but you don’t sit at home and worry about it.
R: I don’t even think about it because I’m so used to it, you know. I’m used to breathing this way.
I: Okay. Anything else you would like to add? Anything else you would like to say about the city of Deer Park?
R: I don’t see any of us leaving any time soon.
R: I do.
I: (Laughs.) One person.
R: She’ll be the rebellion one.
Deer Park Field Notes
Field Day 43, 2005, 1:30-3:30 PM
Visit to Community Event #7
Researcher: Michael J. Palenchar
Names of residents, families and friends have been replaced with pseudonyms in the following transcript in the interest of privacy.

Venue Description

I have stopped in at a community fundraiser, raising money for the local volunteer fire department. This is the fourth community event that I have attended for three weekends in a row.

I walked down to the local fire department from my apartment, approximately five blocks southeast. The fire department is located on the main road that runs through the center of Deer Park, crossing the main near neighbor region that I am studying, though the fire department falls just inside of the south zone of my study.

The barbecue fundraiser is typical to some of the other community events that I have attended. To set the scene, there is a large, portable barbecue pit at the back-center of the open field that sits to the front and left (facing) of the fire department. There are a few balloons and streamers scattered around, mostly to the building, light poles and tables. They remind me of leftover party decorations from a July 4th party. There are about 12 picnic tables set up, the wooden style with benches attached that seat up to eight people fairly comfortably. Folded chairs, temporary card tables and blankets are scattered around the area, away from the road as much as possible. There does not seem to be as much truck traffic on the main road as their usually is – is this a weekend thing that I haven’t noticed before or am I just getting used to all the major truck traffic on local roads?

Plates of barbecue, primarily sausage and ribs, with slaw, beans and potatoes are being sold for a donation. It appears that most people are donating five dollars per plate, and you can go for seconds for free basically. There’s a lot of conversation among the adults, most of the kids sit down for a bit at their parents’ urging, grab a bite and a sip of drink, and go running off with their friends to play.

I still am amazed at how such an ideal family, community event, takes place on a beautiful afternoon, just down the street from some of the largest chemical manufacturing facilities in the country. It’s fairly sunny and not as much haze as there has been the past few weeks. It’s interesting because the plants are within eye sight, especially if you stand...
on one of the tables, but you can still see them just standing up. You really can’t see too much of them sitting down (or at least from my natural height level). But I can hear them too at times. But everyone else seems to be ignoring them, oblivious to them, or really just completely used to them?

Researcher’s Role in Event

I should mention that this is the second community event held at this fire department that I have attended. My plan today, different from the first few community events that I have attended, was to start and spend at least an hour observing and listening to residents’ stories. Then I will initiate one topic discussion several times and see where that goes. Today I initiated what, as a new comer to town, I should be aware of related to living in a community with a high concentration of chemical manufacturing facilities. So in essence I am moving from an observer to a partial participant. This is the direction, participant, that I will move forward on in my research.

Conversations, Actions, Reactions (Narratives, Quotes)

1. The first hour went as expected. No conversation related to living near the plants. Actually, there was one, a limited conversation about the weather and clear sky, with a brief conversation mentioning how nice it would be if there were more days like this, “A lot less haze and pollution.”

2. The second hour went extremely well and was slightly unexpected. I brought up the topic of what I need to be aware of being a newcomer to town. At first they pointed out things such as the city office to sign up for services, one person asked me if I needed to get my phone or utilities hooked up (I told her no, that I already arranged for those particular services). Interesting to note that not one person of the five people seated at the table mentioned anything specifically that I need to be aware of as a newcomer related to living near the plants (consistent with the lack of “natural” conversation about these type of risks in the community).
3. After this discussion, I directly asked is there anything about the plants that I need to be aware of. There was a pause, then a brief discussion about two things related to living near the chemical plants (finally a risk discussion):

A: You probably need to know about the sirens in town. They test them on Thursdays…
B: First Thursdays…
A: In the evening, they just tell you it’s a test, nothing special.
B: Scared the hell out of me the first time I heard it, I always tell my new neighbors to be prepared for that whaling sound. It can be kinda eerie hearing a voice over the city. You’ll get used to it.
R: Anything else?
C: You also should know about what you should do in case of a problem. It’s just common sense like don’t go outside and be careful. They probably have the information in the fire house.

4. After this brief conversation, I went to get more barbecue and quickly detailed the brief conversation. I returned to the picnic table with more barbecue, even though I wasn’t hungry. I was hoping that more conversation would develop from my initiation of the topic and being a new community member, but the discussion turned to their kids, the local football team and work around the house that everyone needed to accomplish. After about 30 minutes at the table, four people left the table, leaving me and one other person, who left a few minutes later. Everyone said goodbye and were very friendly, welcoming me into the neighborhood. No one brought up why I moved to town so I didn’t disclose that I was conducting research.

Researchers’ Diary Notes

1. This is one of the first times that I feel like I got some good, only-partially initiated conversation related to what the residents’ know and think about risk communication issues. I have been frustrated at times, especially the first month, of sitting around, walking around, waiting for “natural” conversations related to my research topic. But this is one of the first times that people really “chained” their stories when the topic was just mentioned. Hopefully a good sign of more
conversations like this.

2. I need to remember to get to these community events when they start. At times I feel like I am arriving after the peek of the event and may be missing out on some good conversations.

3. I am trying to not go to the same type of venues and community events, but I feel that the fire department might be part of the social fabric of this community. So far, for the most part, the fire department is one of the only few safety groups that has been mentioned as a positive force in the community related to chemical manufacturing, the other being the LEPC. At the same time I am aware that this is what our previous, and others, risk research indicated. Am I being influenced by my presently-held perceptions of the industry in this town? The fire department is a member of the LEPC, which has hired me several times in the past to conduct this type of research. But I would argue that this type of research is completely different and I am working on just listening to the stories, hearing how they develop, noting the narratives. Just make sure you are noting all the narratives and not just those that are supporting your previous research findings.

4. I also may be going too far the other way, something that I need to keep in mind. I acknowledged that part of my hopes for this study is to argue that this type of research of publics, based on their perceptions, would be of benefit to this field. I need to make sure that I am giving established risk communication principles the same chance as topics and perceptions that residents bring up on their own that either have not been established in the literature or are counter to established research.

5. This is a reminder to keep these visits to community events under a few hours. It is tiring and stressful at times to stand/sit around observing, taking part in what could really be a fun event but in reality I am working, and then trying to take fieldnotes of conversations, whether I am overhearing them or taking part in them. Actually I think it’s more difficult to take fieldnotes while participating, trying not to be too obvious, listening more than writing, and trying not to affect the flow of conversation by obviously taking notes. I might have affected the conversation today somewhat, it looked like the one older man at the table didn’t like the fact that I was taking notes. He probably left earlier than he would have normally; I wonder what he had to say? How much would he have influenced the focus of the conversation? How many great stories did he have of this community that I will probably never get now? I need to continue to work on taking fewer notes, listening more, then running back to the apartment to build my notes.
REFERENCES


BIOGRAPHICAL SKETCH

Michael J. Palenchar recently joined the University of Tennessee’s School of Advertising and Public Relations as an assistant professor in public relations (Ph.D., University of Florida; M.A., University of Houston; B.A., University of Texas). Research interests include risk communication and issues management related to industrial chemical production, crisis communication, health communication, and general public relations. Teaching areas include risk communication, issues management, crisis communication, public relations campaigns, principles of public relations, and public relations cases-strategies-tactics. He has more than a decade of professional experience working in corporate, non-profit, agency, and as a risk communication and issues management research consultant for clients ranging from Fortune 500 companies to local government agencies. He has four peer-reviewed journal articles that have been published in the *Journal of Public Relations Research* and *Communication Research Reports*. He has two book chapters on risk communication, terrorism, and professional ethics; authored or co-authored twenty regional, national or international communication conference papers and panel papers, winning eight top paper awards; and currently sits on the editorial board of *Communication Studies*. He was the recipient of the 2000 National Communication Association’s Pride Award for top national published article in public relations.
I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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December 2005

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