EXPLORING NIMBY GRIDLOCK: A CASE STUDY OF THE HAYSTACK HAZARDOUS WASTE FACILITY SITING CONTROVERSY

By

KENNETH BOSMA

Bachelor of Science

Oklahoma State University

Stillwater, Oklahoma

1990

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
December, 1996

EXPLORING NIMBY GRIDLOCK: A CASE STUDY

OF THE HAYSTACK HAZARDOUS

WASTE FACILITY SITING

CONTROVERSY

Thesis Approved:

Michael W. Hurley

Thesis Adviser

Will Fisher

James J. Lawler

Kenneth Olson

Thomas C. Collins

Dean of the Graduate College

ACKNOWLEDGMENTS

There are many to whom I owe a great deal of gratitude. Foremost, there is Dr. Will Focht, a friend and mentor. I am forever indebted to him for his assistance in completing this thesis. His pursuit of excellence, coupled with his untiring support, patience, and caring reflect the best of his profession. To Dr. Kent Olson, my major adviser, I thank for getting me started and providing me much needed guidance. I also thank Dr. Mike Hirlinger, my thesis advisor, and Dr. Jim Lawler, who always were there to listen and provide advice and encouragement. It was truly an honor to have worked with each of these gentlemen.

Special thanks are owed to Mr. H. Max Cumpston for his help in completing this research project by "making time". To Sean Trimble, I thank for helping with formatting and for his review of the draft version. I would also like to thank my parents for their constant support.

I am most thankful to my wife, Theresa, for her support and untiring patience in reviewing several drafts. She has endured with me the hard times and the good times. To her, I dedicate this paper.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

An old Pennsylvania steel company, experiencing a serious downturn in the market, decides to expand into the business of lead recycling, a fast growing market in the midwest. After considerable market analysis, it determines that there exists a dire need for a lead smelting plant. A financially risky proposition with great potential, the company secretly invests to prevent competition, buying land and obtaining all necessary permits. Then, poised to begin construction, it notifies the local public of its venture, proud to be doing its part to protect the environment while at the same time offering many new jobs to the community. Much to its surprise, however, the local public rejects the new plant for fear of the associated health risks. Arguments between citizens and company representatives soon follow. Deeply invested, the company chooses to disregard citizen concerns and moves forward with construction anyway. Citizens react immediately. They file for a legal injunction and begin picketing around the proposed site. They seek every avenue of resistance available. No compromise is ever reached, and the plant is never constructed.

This scenario, although fictional, describes an ever-growing problem in this country. Communities everywhere are rejecting facilities that they once

readily accepted. All types of facility siting proposals, including those for prisons, power plants, schools, hazardous waste management facilities, landfills, hospitals, and even daycare centers, are being delayed or completely blocked by public opposition (O'Hare 1977; Popper 1981; O'Hare, Bacow and Sanderson 1983; and Inhaber 1992). If it poses a health or environmental threat, or even a mere aesthetic threat, it is subject to resistance. People simply no longer want facilities sited near them that they believe will have an adverse impact on them or their communities (Kraft and Clary 1991).

This pattern of local opposition is commonly referred to as the NIMBY (not in my backyard) syndrome. Cases of local opposition have been steadily increasing over the past twenty-five years. Beginning with the environmental movement in the late 1960's and early 1970's, communities began to reject facilities on a more regular basis (Armour 1991). People were rapidly learning that they possessed the power to block unwanted facilities. By the late 70's, local opposition had become so pervasive and widespread that it was "officially" given status as a syndrome. Since that time NIMBY has gained even more momentum (Heiman 1990), affecting more types of facilities, and experiencing greater success. Today it occurs with such regularity that it is considered by many observers to be one of the most significant obstacles to facility siting (Duffy 1984; Mitchell and Carson 1986; Lake 1987).

At Oklahoma State University, a team of researchers made up of faculty and students have conducted a study aimed at exploring solutions to the NIMBY

problem. The study, which involved the investigation of seven cases in Oklahoma where local opposition occurred or threatened to occur, specifically targeted hazardous waste management disputes (Focht 1995). These disputes were selected because they are most common and, as such, solutions found for them could likely be applied to other NIMBY disputes.

This paper documents the investigation of one of the case studies, a hazardous waste management facility siting controversy that occurred in the early 1980's in rural southwest Oklahoma near the small township of Haystack. The dispute, which lasted for nearly six years, followed a classical NIMBY pattern. Developers, following state siting requirements, did not notify the affected citizens until they filed their application for a construction permit. They had already purchased the necessary land and designed the facility. Citizens responded with opposition. Developers pressed the issue and the dispute ended in complete gridlock.

The goal of this study was to obtain a valid interpretation and understanding of the viewpoints held by those who participated in the Haystack controversy in order to explain what happened and what could have been done differently to avoid gridlock. While we were primarily interested in the concerns of citizens, we sought the viewpoint of proponents for purposes of identifying the stimuli to which citizens responded. We utilized four research methodologies to accomplish this: Q methodology, a structured questionnaire, an open-ended interview, and a card-ranking exercise; the results of which were examined in the

context of prominent NIMBY theory. In doing this, we hoped to advance NIMBY theory by either confirming or disproving existing thought, or by discovering another reason for siting gridlock.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

There are a multitude of explanations for siting gridlock found in literature. Among these selected for review in this chapter are four offered by Armour (1991): inequities in the distribution of costs and benefits, perceived risks, feelings of loss of control over forces affecting the quality of one's life and community, and lack of trust in facility proponents and regulators. These propositions form the conceptual foundation for this study.

Perceived Risk

Hazardous waste facilities, by their very nature, pose a number of adverse impacts to human health and the environment. Michael Baram (1976) has identified several, both qualitative and quantitative, that are thought to concern the public.

- Ecology: includes erosion, landscape changes, and air and water pollution.

- Economy: includes private property values, taxes, local and regional jobs.
- Regional and community quality of life: includes human health (both physical and psychological), aesthetics, congestion, odors, traffic.
- Social and political factors: includes changes in residents and life styles, changes in social opportunities, changes in municipal systems (taken from Morell and Magorian 1982:62).

What is most salient to citizens is determined by the characteristics of the facility (e.g., *noisy* airports, *ugly* power plants). Health concerns, for instance, particularly for children's health are by far the primary public concern associated with noxious facilities (Matheny and Williams 1985; Kraft and Clary 1991). Portney (1991) has found this to be especially true with hazardous waste facilities.

How people perceive these adverse impacts has been shown to play a significant role in NIMBY disputes (Portney 1986 and 1991). There is strong evidence in literature to suggest that laypersons do not perceive risk the same as experts (Tversky and Kahneman 1981; Slovic, Fischoff and Lichtenstein 1984; Covello 1983; Slovic 1987; Armour 1991). While both groups perceive risk as a combination of probability and consequences, they are thought to use substantially different criteria and analytical methods for estimating "riskiness" (Covello 1983). Where experts tend to utilize mathematical methods of calculating risk, laypersons tend simply to use culturally-defined heuristics to

judge risk based on its qualitative attributes and their experience with it (Slovic 1987). It is this difference in perception that causes gridlock.

For many risk managers, risk is acceptable if the benefits offset the costs. Through the use of scientific risk assessments they estimate risk based on the likelihood of occurrence and the degree of the resulting hazard (Armour 1991). They produce a quantifiable risk value (e.g. 10^{-6}, or one in a million) that they consider acceptable. This value is then made the point of departure from which decisions are made. Sites are selected, and facilities designed and constructed, often times based solely on these calculations. Little or no consideration is given to community concerns about the imposing threat. In fact, most experts disregard the public's perception of risk, claiming that they are not adequately informed and are in need of education (Slovic, Fischoff and Lichtenstein 1984; Slovic 1986; Wynne 1983; Otway 1987). Citizens not subscribing to risk assessment results have even been labeled by some experts as irrational (DuPont 1981).

While experts give equal weight to probability and consequence, Rubin (1986) has found that laypersons concern themselves primarily with the consequence. The result of scientific risk assessment is but one criterion that laypersons consider important in evaluating risk. Psychometric studies have revealed that they also are concerned with the qualitative attributes of risk (Tversky and Kahneman 1981; Otway and von Winterfeldt 1982; Slovic, Fischoff and Lichtenstein 1984; and Armour 1991). Slovic (1986) specifically identified

voluntariness, dreadfulness, catastrophic potential, controllability, familiarity, likeliness to cause injury or death, and newness as important factors.

Other issues affecting risk perception are the characteristics of the perceiver. Social and cultural studies on risk indicate that individual values influence perceptions (Douglas and Wildavsky 1982, Rayner and Cantor 1987). Vlek and Stallen (1980) have found that risk acceptance depends more on value orientation and less on factual information. Experts and laypersons thus do not share the same values when it comes to deciding on risk acceptability (Ashford 1988; Folk 1991). People highly value their health, property rights and individual freedom and, therefore, generally reject risk assessments that conflict with, or threaten, these values (Bord and O'Connor 1992). Also important in influencing perceptions is how much experience a person has with risk (Fessenden-Raden *et al.* 1987), how much the media has shaped their beliefs (Slovic 1987), and what their attitudes towards risk are (Weinstein 1984).

Trust in Government and Industry

Adding to the risk perception problem is the apparent lack of trust in government and industry (Kasperson 1986; Kunreuther et al. 1990; Pijawka and Mushkatel 1991; Kraft and Clary 1991). Distrust, as Kraft and Clary (1991:322) argue, is what "fuels emotion, which heightens fear of the perceived risks." Distrust directly affects the public's ability and willingness to evaluate siting

proposals on their own merits (Kasperson 1986; Armour 1991). After all, it is difficult to believe the message when you do not believe the messenger.

Trust is considered by many to be a significant dimension in siting controversies (Kasperson et al. 1992, Slovic 1993; Kraft and Clary 1991; Kraft 1994) In fact, Hodges-Coppel (1987) argues that government and industry's low credibility is the main cause of siting gridlock. It propels people towards uncompromising opposition (Kraft and Clary 1991). Wildavsky and Dake (1990:56) add "..the great struggles over perceived dangers of technology in our time are essentially about trust and distrust of societal institutions."

Focht (1995:39) concisely explains why institutions are distrusted: "Government is distrusted due to its past failures to protect citizens from threats to human health, safety, welfare and the environment. Business and industry are distrusted because of their legacy of irresponsibility, absence of care, and liability shifting..." But this distrust is not unwarranted. These institutions, with the help of the media, contributed to their own demise. Debacles such as Watergate, Three-Mile Island, Love Canal and the Iran-Contra affair all serve as benchmarks on the trail of diminishing public trust.

If the individual actions of each institution were not enough to cause distrust, there is now evidence that they all share similar views towards siting facilities. In particular, government, whom the public relies on to protect them, is believed to side with industry in facility permit decisions (Fischoff, Slovic and Lichtenstein 1983; Lawler and Focht 1989; Lawler, Focht and Hatley 1992).

Citizens also perceive this to be true: Wynne (1992) found that citizens think siting procedures are biased towards project developers. This perception leads citizens to question the government's ability to objectively evaluate the fallibility of technical analyses (Armour 1991).

Feelings of Loss of Control

The inability of a community to stop the siting of an unwanted facility, thus suffering its adverse impacts, is thought to affect people's sense of well-being. Threatening events can shatter people's basic assumptions about the world, giving way to new perceptions marked by threat, danger, insecurity, and self-questioning (Edelstein 1988). Edelstein (1988:181) adds that people may experience "feelings of depression and a sense of being helpless and disabled." These feelings and perceptions lead people to get involved in order to maintain a sense of control over the forces affecting their lives (Bachrach and Zautra 1985).

There is empirical evidence to support the loss of control theory. Edelstein (1988) found in his case study of Legler, a contaminated neighborhood in Jackson, New Jersey, that loss of control was a dominant theme for residents.

Inequities in the Distribution of Costs and Benefits

Public opposition to needed facilities posing adverse impacts can also be explained to some extent by the distribution of costs and benefits (Morell and Magorian 1982; Portney 1991; Armour 1991). Opposition is as O'Hare

(1971:419) calls "...a problem of resource allocation between small but concentrated and large but diffuse interests." Where people perceive the costs or risks, such as effects on human health, lifestyle, environmental quality, or property values to be higher than the benefits, which is usually the case, they reject the facility (O'Hare 1977; O'Hare Bacow and Sanderson 1983; Kraft and Clary 1991). The more they learn about the hazards of a facility, the more they realize they can only lose by its siting. Unless, of course, the facility offers some major benefit (Edelstein 1988).

Portney (1991) claims that inequities in the allocation of costs and benefits is the basis for NIMBY because siting locally unwanted facilities elsewhere would allow the benefits to society while eliminating the risks locally. Morell and Magorian (1982:73) add "concern[s] over equity is a fundamental aspect of all debates over siting."

More than just the characteristics of a facility raise questions of inequity, however. The proposed location of a facility, whether it is in a densely populated area or a rural area, causes concern. People in rural communities do not want to bear the risks for industrial development, such as managing someone else's hazardous waste (Morell and Magorian 1982; Portney 1991). Conversely, people in industrialized areas feel that they are already bearing a disproportionate share of society's burdens and that others should now do their part (Portney 1991). "The fact that one is asked to bear the risks for others

without sharing the benefits provides a sufficient basis for perceptions of inequity" (Edelstein 1988:185).

Summary

The four theories described above are believed to be primary causes of siting gridlock. Extending these theories to the Haystack case, it is hypothesized that gridlock was due to:

1. Differences in sense of control;
2. Differences in perceived fairness of the distribution of costs and benefits;
3. Differences in risk perception; and
4. Differences in social trust in government and industry.

CHAPTER III

CASE HISTORY

On January 10, 1984, Material Management and Recovery Systems, Incorporated (MMRS) of Oklahoma City, Oklahoma filed application with the Oklahoma State Department of Health (OSDH) for a permit to construct a controlled industrial waste disposal facility in the southwest part of the state. Following a two year feasibility study, MMRS had selected a 200 acre plot near Haystack Mountain in portions of Section 1 and 2, Township 7 North, Range 24 West, in Greer County, Oklahoma. The site was selected based on its relatively dry climate, low agricultural value, remote location, sparse population and favorable geology. The facility itself was to occupy 71 acres and was to include a landfill, a drum pit, two surface impoundments, two land treatment units, an oil recovery system and other ancillary equipment.

On January 12 and 19, 1984, MMRS publicized its intent to construct the commercial hazardous waste facility in the Mangum Star-News, a weekly newspaper published in the city of Mangum, Oklahoma, located 16 miles south of the site. MMRS also notified by letter all owners of real property within one mile of the facility. This notification of "affected property owners" was mandated by law. The notice provided a 45-day period during which any person residing or

conducting business in Oklahoma could comment and/or request an informal public meeting to present written or oral views recommending or opposing the application. In addition, any affected property owner, or organization with twenty-five members who were legal residents of Oklahoma could request a formal hearing.

Shortly after notification, MMRS set out to "educate" the public about its proposal. They conducted public meetings on January 25 and February 1, 1984, in Mangum and Sayre, Oklahoma (19 miles north of the site). Citizen reaction to the proposal was extremely negative. At the end of each meeting, citizens rallied to collect money for organized resistance. By the end of the second meeting, over $6,500 had been collected and the Haystack Environmental Group, Incorporated (HEGI) formed. HEGI was made up of a Board of Directors who represented all concerned citizens. It met formally one week after the first MMRS meeting and filed a request with OSDH for a hearing. Soon after, the Elk City (26 miles north of the site) city council adopted a resolution against the site. The Elk City Jaycees and Chamber of Commerce led the opposition in the Elk City area, which became a primary player in the struggle to stop construction of the facility. Over the ensuing summer informal meetings were conducted sporadically by all organized groups and over 10,000 letters and postcards opposing the facility were mailed to then Governor George Nigh's office. By late fall, the Oklahoma Farm Bureau had even passed a resolution of opposition.

Public concern was primarily for their health. Citizens expressed their fear at meetings of widespread contamination of the environment, especially groundwater. Contrary to claims made by MMRS that the area was well suited for such a facility, citizens presented photographs and I-witness testimony that the area was subject to flooding and that massive underground caverns throughout the region made it an unstable site.

On May 4, 1984, OSDH returned the permit application to MMRS issuing a Notice of Deficiency. Of particular concern to OSDH were issues involving groundwater and surface water contamination threats, and waste-to-liner compatibility. MMRS was given six months to revise the application and resubmit. Fearing that that was the final review by OSDH, HEGI and other opposition groups from Elk City, Altus and Mangum convened a formal public meeting in Elk City on October 16, 1984, a month before MMRS was expected to submit it's revision. In attendance at this meeting was State Senator Gilmer Capps and State Representative-elect Danny George. Capps went on record saying that he was willing to author or co-author a bill outlawing hazardous waste disposal facilities. George also commented that he was for "outlawing any and all such dumps" (Sayre Journal, 1984).

On October 26, 1984, MMRS submitted a revised application to OSDH, addressing most of the problems. The application was again reviewed critically in light of revised rules and regulations and was returned to MMRS on December 26, 1984. However, a month before the State returned the application, the Altus

Jaycees and Chamber of Commerce held a meeting with State Senator Capps, Representative George, and Representative Howard Cotner to discuss the use of legislation as a means to block proposed construction. This marked the beginning of state legislative intervention.

On March 20, 1985, MMRS submitted its second revision of the application. OSDH reviewed the documentation and asked for clarification on certain items. MMRS submitted an addendum addressing those items on May 30, 1985. That same day House Bill 1560 was enacted during an emergency session. The bill mandated that county commissioners in counties contiguous to a proposed hazardous waste facility assess the adequacy of the roads designated for use by vehicles transporting wastes. Commissioners' from Beckham and Greer counties assessed improvements at $20 million. Upon review of the commissioners' findings by OSDH, a determination was made to upgrade only one gravel road. This decision by OSDH appeared to favor MMRS and caused disgruntlement among opposition leaders toward OSDH.

In an effort to force a consensus between all parties of the Haystack dispute, Governor Nigh convened an environmental conference on June 8 and 9, 1985. In attendance were MMRS representatives, OSDH officials, HEGI leaders, and other individuals that opposed the site. High tensions, however, quickly transformed the conference into a forum for accusations, rather than consensus. No progress was made.

In spite of the problems made evident by the environmental conference, OSDH announced its intentions to issue a construction permit on September 29, 1985, the first of two permits required before the facility could accept waste. The decision to issue the permit was based on MMRS's compliance with the regulatory requirements set forth in the Rules and Regulations for Industrial Waste Management, effective February 6, 1984 (ODH Bulletin No. 0525). There appeared to be no other criteria used in the decision process. During the mandatory comment period that followed the announcement, citizens requested a public meeting. OSDH scheduled an informal meeting on December 9 and 10, 1985 and a formal hearing on December 12, 1985, and January 20, 1986. The informal meetings were held in Mangum at the high school auditorium.

Sometime in early 1986, a procedural discrepancy in the permit application process was identified by opponents of the facility. Due to an incomplete mailing list, MMRS had failed to notify all affected property owners of the scheduled hearings. The result was a delay in permit issuance until all affected property owners could be contacted. This discrepancy proved to be a major milestone in the defeat of the proposal. During the time that MMRS was searching for overlooked property owners, Senate Joint Resolution No.33 was approved (April 11, 1986), declaring a 12 month moratorium on processing or issuing of construction or operating permits for all industrial waste facilities. Immediately, OSDH issued a stay of the permit proceedings pending expiration

of the moratorium. The moratorium was the direct result of lobbying by State Senator Capps and Representatives' George and Cotner.

Although the stay was issued for 12 months, it was not lifted until the summer of 1989 when MMRS requested that OSDH renew processing of its permit. After conducting two more hearings, OSDH ruled that the entire application be revised and resubmitted to reflect the many regulatory and statutory changes that had occurred during the intervening three years. MMRS disagreed with the findings of the state and filed suit in District Court in November, 1989. MMRS contended that their permit application was subject to the rules and regulations applicable at the time of initial filing. The case went to court twelve months later. Without hearing testimony, the court found in favor of the state. As of May, 1994, the application remains open pending revision by MMRS.

CHAPTER IV

METHODOLOGY

A multi-instrument survey combining both qualitative and quantitative methods was used in this study. The survey included Q-methodology, which was the focal point of the study, a structured questionnaire, an open-ended personal interview, and a card-ranking exercise. The goal of the design was to test the six hypotheses reviewed in Chapter 2. The use of several methodologies was intended to add validity to the study.

In the ensuing sections each part of the survey process is presented in detail. The design of the initial survey, its pretest, and construction of the final survey is first discussed, followed by a description of the sampling design. The chapter concludes with a description of the specific instruments and how they were employed in this study.

Survey Design and Pretest

As discussed in Chapter 1, this case study is part of a larger multi-city study. As such, an initial survey was developed that would be flexible enough to apply to each case, yet ensure consistency in data collection. Pretesting of the survey was conducted in Ponca City, Oklahoma, where two versions were

administered to a group of sixteen citizen activists recently involved in a TIMBY (threat-in-my-back-yard) dispute. The result was a need for refinement of the questions and a change in survey presentation from a group setting to a one-on-one interview.

The next step was to tailor the survey to the case. This required a thorough understanding of the events as they occurred. Historical information was collected from several sources including Oklahoma State Department of Health (OSDH) fact sheets; newspaper articles and legal notices from the Mangum Star-News and the Sayre Journal (Carlisle 1984); and scholarly papers previously written on the Haystack controversy. A general understanding of the dispute allowed not only for adaptation of questions, but facilitation of dialogue between the researcher and respondent. It should be noted here that not all questions in the final survey were applicable to this study. For instance, questions concerning sense of community, while important to the larger study, were asked, but the results not incorporated in this paper.

Sampling Design

The survey was administered to selected stakeholders who played an active role in the controversy. Stakeholders included local citizens, MMRS representatives, and state and local government officials. The sample was obtained through archival research and word of mouth. After first acquiring an initial list of stakeholders, each was contacted by telephone, informed of the

study and its purpose, asked to participate, and then asked to provide a name of another stakeholder. Using this process a total of 22 potential respondents were identified, 14 of which were willing to participate in the survey (12 citizens, 1 MMRS representative, and 1 State government official). While the desired sample size was 23, as determined by a formula suggested for use in Q-methodology (n [number of participants]=N [number of Q-statements]/2-1) (Carr, 1989), 14 was sufficient to produce an acceptable multi-factor solution. Justification for this number is provided in the Q-technique section.

Survey Description

Q Technique

Before describing the Q technique, it is beneficial to first briefly discuss the methodology behind it and why it was selected for this study. Q methodology is a scientific paradigm designed specifically for the direct measurement of an individual's point of view (Brown 1980). It requires a list of statements of opinion about the subject to be studied. Following a specific condition of instruction, respondents rank-order the statements into a quasi-normal forced distribution. The sorts are then subjected to principle components factor analysis with orthogonal varimax rotation which reveals perspectives held in common by participants.

Q-methodology is ideal for studies where the sample population is small, as in this case, because it concerns populations of statements rather than

populations of people. A further advantage of Q is that it is an abductive technique, that is, it reveals a participant's subjectivity with minimum researcher-induced bias. Individuals are factored across variables (statements) instead of variables across individuals. In this manner, an individual's self-referent perspective is made operant. For those seeking a complete description of Q-methodology, refer to Brown's (1980) book, *Political Subjectivity: Applications of Q-Methodology in Political Science*.

The Q-sample in this study consisted of 47 statements derived by the research team about environmental decision making (see Table 3). The statements included in the Q sample address each of the 6 hypotheses. For example, equity was addressed by statement #38. Trust was addressed by statement #32. Respondents were to read through the statements in order to *get a feel* for their content and separate them into three equal groups of most agree, neutral and least agree, while thinking about their views concerning the siting of a hazardous waste facility in their community. They were then to spread the cards out, reread the statements, and place each on the form board starting with most agree (+5), then least agree (-5), and back and forth until all cards were placed on the board. Respondents were invited to review their sort and make any necessary changes. Each was afforded the opportunity to expound on their reasoning for their specific sort. The final Q-sorts were preserved by transferring them to a score sheet. Analysis of the sorts was conducted back at

Oklahoma State University using PC QUANAL, a statistical factor analysis program designed specifically for Q-methodology (Van Tubergen 1975).

The final step in the Q technique process is to validate or confirm the interpretation of the results and assign a title to each factor based on the perspective revealed by the Q sorts. Validation is accomplished by contacting the "pure loader" for each factor. The pure loader is that person who's sort most closely describes the factor. He or she is asked if the assigned title is appropriate and descriptive.

Structured Questionnaire

The structured questionnaire was designed to ascertain the extent of the respondents' involvement in the controversy, their relationship with MMRS and government agencies, and their social and environmental context (see Appendix A). This information was used to interpret the Q factors and the discussion of results from all four methodologies. The social and environmental context data was collected for purposes of linking demographic, social, and physical variables with responses collected from the other methodologies in the survey. Specific questions were aimed at respondents' careers, ages, their proximity to the proposed facility, and their community involvement.

The questionnaire consisted of 8 questions, mostly multiple choice, with a few fill-in-the-blank. It was given to the respondents and read aloud by the interviewer. This was done primarily to ensure clarity of the questions. The

respondents marked the appropriate answers and returned the questionnaire to the interviewer. The questionnaire was reviewed for completeness and readability.

Open-Ended Interview

This method brings greater depth and interpretation to the Q-sort and rank-order card sort by providing respondents an opportunity to express freely their viewpoints. Participants were encouraged to elaborate on their responses, differentiate between issues, and clarify any potential interviewer misinterpretations. The interview contained twelve questions regarding respondents' opinions and recollections of the dispute, why and for what reasons they became active, their concerns about the siting proposal, their perception of government, industry and the community, effects of the proposal on themselves related to their sense of community and on the community itself, and finally, what they would like to see happen to avoid controversy if the same situation were presented today (see Appendix B).

Respondents were specifically instructed to answer questions based on their viewpoint at the time of the dispute. Extreme care was taken not to influence or lead respondents in any way that would bias their responses. With permission, all open dialogue was recorded. At the completion of the interview, respondents were given opportunity to add or expound upon their responses.

Rank-Ordered Card Sorts

Two rank-ordered card sorts were employed in this case. One sort consisted of thirteen cards (see Appendix C) inscribed with decision criteria typically used by policy makers when proposing construction of hazardous waste management facilities, and the other, nine cards with preferred public participation strategies (see Appendix D). Each sort was administered separately. The decision criteria sort was aimed at determining what citizens believe should be important in siting hazardous waste facilities, while the public participation sort was aimed at determining what citizens believe is the best way to avoid gridlock.

In both sorts, respondents were to rank the cards in order of subjective importance. They were informed that the cards were in no particular order and that there was no "right" way to arrange them. They were to read through the cards first, asking for explanation if necessary, sort them, and then lay them out in rank order. No ties were allowed. They were encouraged to examine their sorts and make changes if desired. After they had felt comfortable with their sorts, they were asked to group them, if possible, by those highly important, somewhat important, and not important. At a minimum, they were asked to sort them into at least two categories. Frequency distributions were then tabulated for both sorts.

Procedures for Administering the Survey

The research participants were initially contacted by telephone two weeks in advance and asked to voluntarily participate in the survey. Appointments were scheduled and interviews conducted over a period of four days. As many as four interviews were conducted in a given day. All interviews were conducted during the daytime.

The day of the interview, respondents were again contacted by telephone for final coordination. Interviews, as stated earlier, were conducted at the respondents' home or place of employment. The interview process began with brief introductories, presentation of researcher credentials, and a more thorough explanation of the study. Respondents were then asked to sign a consent form signifying their voluntary participation. All respondents were assured complete anonymity.

Interviews were conducted in a one-on-one setting. No one else was allowed to sit in during the interview, or in any other way influence the respondent. The survey was presented in the following order: structured questionnaire, open-ended interview, Q-sort, and rank-ordered card sort. It was administered while sitting at a table so card sorts could be easily accomplished. Prior to administering each instrument, participants were thoroughly informed of its purpose and given appropriate instruction. At anytime during the interview, they were free to stop or take a break. At the conclusion of the interview,

respondents were again explained the purpose of the study and asked if they would like a copy of the completed research paper.

CHAPTER V

RESULTS

Stakeholder Demographics

Fourteen stakeholders participated in this study. Eleven were active members or supporters of HEGI, which opposed the facility, and three supported the facility. Facility supporters included the MMRS representative, the state government official, and a citizen/business owner who owned land near the proposed site. Table 1 summarizes the demographic characteristics of each.

Of those that participated in this study, only three (H4, H5, and H6) lived within 10 miles of the proposed site. Respondents H8, H9, and H10 owned property within 10 miles of the site, but lived more than 30 miles away. The MMRS representative and government official were not from the area.

Also, eight of the respondents admitted that they were still active within their communities in citizens' groups or service organizations other than HEGI. Furthermore, all but one (H3) willingly participated on a frequent or continuous basis. The remaining demographic criteria are self explanatory.

TABLE 1

DEMOGRAPHIC PROFILE OF RESPONDENTS

Respondents	Proximity to Site (miles)	Currently Active	Frequency	Gender	Age	Education	Occupation
OPPONENTS							
H1	10-20	No	Never	F	58	High School	Farmer
H2	10-20	No	Never	M	60	4 yr College	Farmer
H3	20-50	Yes	Occasionally	M	48	Law School	Lawyer/Rancher
H4	<10	No	Never	M	57	High School	Farmer
H5	<10	No	Never	F	57	1 yr College	Farmer
H6	<10	Yes	Continuously	M	74	4 yr College	Farmer
H7	10-20	No	Never	M	55	High School	Gin Operator
H9	<10	Yes	Frequently	M	63	1 yr College	Insurance/Farmer
H10	<10	Yes	Continuously	F	68	High School	Business Owner/Rancher
H11	20-50	Yes	Frequently	M	50	Graduate School	Business Owner
H12	20-50	Yes	Continuously	M	42	Pharmacy School	Pharmacist
PROPONENTS							
H8	<10	No	Never	M	64	4 yr College	Business Owner
H13	20-50	Yes	Continuously	M	40	Graduate School	Politician
H14	100-150	Yes	Continuously	M	54	High School	Engineer

Results of the Personal Interviews

Opponents

Citizens' who opposed the facility did so because they perceived the risks to be unacceptably high. They were more concerned with the consequences of the facility than the probability of those consequences occurring. They specifically identified threats to health, property values, posterity, and the environment. Of these, health threats, particularly those to future generations, was of primary concern.

Citizens rejected the probability estimates calculated by MMRS to address these concerns because, as one respondent put it, they were "inconsistent and incomplete." Citizens did not think that MMRS had weighed all the factors.

> *"MMRS didn't know about the land they were after. They're just a bunch of educated fools."*

> *"The area has flooded, even though they say it hasn't, and there are a bunch of sinkholes and caverns below the site that could collapse."*

> *"The people in the Haystack group were people who lived on the land surrounding the proposed site, who know the land, the water shed and how the proposed site would affect it really."*

This theme routinely appeared throughout the interview process. Citizens were disappointed in MMRS and state government officials. They could not understand how MMRS was able to acquire a construction permit for the facility given the apparent discrepancies in the risk estimates. This led them to question the integrity of both the state and MMRS.

While some citizens believed that the Health Department was genuinely concerned about them,

> *"They (Health Department) were stuck in the middle, trying to help us but having to meet the requirements of the EPA."*

> *"They (Health Department) are too busy to keep up with all the laws. I think they meant well, but their hands were tied."*

others believed that it had sided with MMRS, and that it was ignoring its responsibilities to the public. Some even believed that it was influenced by money.

> *"The health department believed the company rather than us."*

> *"I think that the health department was bought off."*

As for MMRS, citizens believed that they were lying to them, withholding information and/or inaccurately representing the facts. They were convinced that MMRS's sole purpose for building the facility was monetary gain.

> *"The company was dishonest. They lied from the beginning and just kept on lying."*

> *"In my opinion, these people (MMRS) were not concerned about our welfare, only money."*

However, when asked whether they distrusted government and industry as a whole, citizens were not so condemning. All 11 of them expressed a certain degree of trust in both institutions, even though they questioned their ability to make sound environmental decisions.

> *"Well, I trust them (government), but not to make decisions about the environment."*

> *"I don't distrust industry, I just think they're only interested in the bottom line."*

Of particular concern was the role of federal government in the decision making process. They believe that the federal government is out of touch with local communities and should have therefore excluded themselves from the siting process.

> *"I trust government, I just don't feel represented by the federal government because I live in small town."*
>
> *"The federal government doesn't feel for the community. They're too far disconnected."*

Industry, on the other hand, was not so scrutinized. Citizens agreed that there is a need for industry to provide goods and services to society, but that they must be honest and environmentally responsible.

> *"I think industry is needed if it is for the good of the country. They have progressed in the environmental area."*
>
> *"I'm for industry if they have a proven record of being environmentally safe."*

Citizens also expressed concerns of inequity in the distribution of the facility's costs and benefits. They did not believe they should have to bear the risks from the facility while those living in the city reaped all the benefits. Many thought companies should be required to reduce or eliminate the production of hazardous waste and store that which they do produce at the plant where it was generated, rather than ship it to some remote location.

> *"How come we have to suffer from the facility when all the advantages stay in the city?"*
>
> *"If they're going to put the waste here, then bring all the jobs with it."*

"Companies should be forced to keep the waste at their plant and not dump it on communities."

Other questions of inequity that surfaced involved site selection. Several citizens opined that the Haystack site was selected not because of its supposedly ideal geological characteristics, but because of the economically depressed condition of the area and the unlikelihood of citizen opposition given the site's remoteness.

"They didn't think we'd fight because we're just farmers and ranchers. They acted like this area was a wasteland and that no one would care."

Proponents

Due to the different roles each proponent played in the dispute, the results of each interview was different. Therefore, for ease of discussion, the results are presented separately.

MMRS Representative

The MMRS representative blamed both the citizens and the Health Department for the demise of the facility proposal. He accused citizens of being uninformed about the facility and unwilling to accept the information that was provided. He thought they were selfish and only opposed the facility because it was easier to oppose it than it was to accept it.

"Citizens want use of the environment, just not the responsibility of keeping it up."

He blamed the Health Department for not providing the necessary technical support and unjustly siding with citizens. In fact, he believes the Health Department worked with citizens to repeal the facility.

> *"We did everything they (OSDH) asked of us, and then they changed the rules."*

> *"They (citizens) did not even know where the actual location of the site was going to be. We tried to explain it and they wouldn't listen."*

> *"Those people (citizens) were convinced that radioactive waste would be stored there at the facility."*

In his opinion, MMRS had met the Health Department's hazardous waste facility siting requirements, which are designed to protect human health and the environment, and therefore should have been allowed to proceed.

He strongly believed MMRS is a responsible company that is environmentally conscious. He pointed to a specific instance of how MMRS refrained from illegally buying legislative influence as an example.

> *"There were lobbyist who told us to give them a blank checkbook and it would be done."*

However, he thinks there must be a balance between the economy and the environment.

> *"You can't deny a man use of his property because of environmental concerns."*

State Government Official

The government official saw himself as a dedicated public servant trying to protect the interests of all citizens. His involvement in the dispute was

therefore, in his eyes, mandatory. He believed that government's role is to be an arbitrator, settling disputes between citizens and industry, even though he admitted that government is not always sensitive to the public's needs.

> *"Government is unable to keep pace with citizen concerns. They do not always effectively act in citizens' best interest."*

He did, however, support the Health Department's actions in the dispute. He thought they listened to the citizens and tried to incorporate their concerns into the decision process. His only criticism of the Health Department was that they did not possess adequate technical expertise.

> *"They (Health Department) should have been in tune with current technology. They should have searched for better methods, rather than simply following the letter of the law."*

MMRS's actions also received overall support from the official. He thinks that they were conscientious about what they were doing, following the law, and that they were employing the best available technology of the time. He criticized them only for not listening to citizens and being inflexible.

> *"MMRS should have held more meetings and established better relations with citizens. They should have amended their plan."*

He believed industry is necessary and, if they are good "corporate citizens", they should be trusted to construct and operate hazardous waste facilities.

Citizen/Business Owner

This respondent owned property that MMRS wanted to buy for the construction of the hazardous waste facility. While he did not sell any of his

property, he did believe that MMRS had complied with the requirements of the Health Department and should have been allowed to construct.

> *"I didn't have a problem with the site if they (MMRS) complied with the law."*

He only stayed involved in the siting process because he questioned MMRS's financial ability to clean-up in the event of an accidental release.

He generally trusts in government and believes that they are responsible for regulating industry. He does not believe, however, that industry should be trusted to make siting decisions on their own.

> *"If they (Industry) were left to decide on their own, they would probably act in self-interest."*

Q Factor Results and Interpretation

Five orthogonal factors were extracted using the principle components method. Retained were those factors with an eigen value greater than 1 and having an explained variance greater than 7%. Two factors met these criteria. Each was distinct as indicated by their low correlation coefficient (0.185). Together, they explain 51% of the total variance and account for all 14 respondents.

Table 2 contains the re-ordered matrix for the factors after varimax rotation. Significant ($p \leq .001$) factor loadings were those with scores of 0.451 (3.090 standard error=3.090 [$1/\sqrt{47}$]=0.451) or greater. At this critical value, 11 of the factor loadings are significant, 1 loading is confounded (for H10), meaning

the individual loaded significantly on both factors, and two are considered not significant (H8 and H13). However, at $p \leq .01$ the loadings of both H8 and H13 are significant on Factor B. Therefore, in the discussion Q sorts from H8 and H13 are included.

Table 3 presents the z-scores for each of the statements comprising each of the factors. The z-scores can be used to reveal the structure of the common factor. The z-score arrays allow interpretation of the perspectives held by those respondents who loaded significantly on that factor. Of particular interest are those statements with a z-score of $\pm$ 1.00 or more. These are statements about which respondents had strong feelings. However, all distinguishable statements (those more than 1 standard deviation apart) and consensus statements that helped to further explain the factors are given consideration.

TABLE 2

RE-ORDERED FACTOR MATRIX

Respondents	Factor A	Factor B	Pure
FACTOR A			
H1 Farmer	0.807	-0.020	0.999
H3 Lawyer	0.833	0.058	0.995
H6 Farmer	0.804	0.083	0.990
H9 Insurance	0.703	0.080	0.987
H7 Gin Operator	0.777	0.145	0.966
H2 Farmer	0.682	0.155	0.951
H11 Business	0.781	-0.197	0.940
H4 Farmer	0.648	0.260	0.862
H10 Business	0.666	0.459	0.678
H12 Pharmacist	0.582	0.448	0.629
H5 Farmer	0.474	0.374	0.617
FACTOR B			
H14 Business	0.050	0.578	0.993
H8 Business	-0.181	0.431	0.851
H13 Politician	0.308	0.450	0.682

where $p \leq .001$, critical value equals 0.451

TABLE 3

TYPAL ARRAY Z-SCORES

Statements	z-Scores	
	Factor A	Factor B
1. Waste facility siting means economic growth and prosperity for the community.	-1.7	0.4
2. Offering cash payments to a community is the same as a bribe.	0.3	-1.6
3. When jobs are scarce, an increase in employment is good even if there is resulting pollution.	-1.7	-1.7
4. If environmental restrictions limit the ability of a company to make a profit, the restrictions should be relaxed.	-1.5	-1.3
5. Industry works with communities to maintain a good public image.	-0.7	0.2
6. Scientific risk assessment should be the major consideration in siting decisions.	-0.3	1.8
7. Citizens need to control which risks they have to put up with.	0.8	-1.0
8. We should not take any chances with the environment.	1.6	0.2
9. I tolerate risk as a fact of life, but I don't like it.	-0.2	0.9
10. It doesn't matter how much we pollute today because tomorrow's technology will solve the problem.	-2.3	-1.2
11. The world would be a better place to live if we could go back to the good old days.	-0.5	-1.4
12. It is better to put facilities in communities with high unemployment; the people there need the jobs.	-1.3	-0.9
13. The people who benefit the most from a waste facility are not the ones who bear the risk.	1.5	0.2
14. Government and industry know what they are doing; they are the experts.	-1.7	-0.5
15. Cost effectiveness in more important to industry and government than environmental issues.	0.3	-0.3
16. The government adequately enforces environmental laws to protect human health and safety.	-1.5	0.3

TABLE 3 (CONTINUED)

TYPAL ARRAY Z-SCORES

Statements	z-Scores	
	Factor A	Factor B
17. Industry usually complies with environmental laws even when it costs them money.	-1.4	0.8
18. Environmental laws are full of loopholes for industry advantage.	1.1	-0.7
19. The character of a community changes after a waste facility is located there.	0.1	-0.3
20. Allowing a waste facility to locate in a community divides a community.	0.5	-0.2
21. Waste facilities give a community a bad reputation.	0.5	0.3
22. Citizens should be involved in every step of a siting decision.	1.1	0.7
23. Citizens have ample opportunity to be involved in siting decisions in their community.	-0.9	1.1
24. Industry, government and the public should decide together what level of pollution should be allowed.	0.6	0.5
25. All information should be shared in easily understood language as soon as it is available.	0.7	1.2
26. Who provides information makes a difference to me; the person must be honest.	1.0	2.1
27. It is really hard to know if decision makers have the same values as I do.	0.4	0.7
28. It is impossible to know whether or not a process is really safe without adequate technical education.	0.1	1.5
29. If the public were more familiar with the operation of a waste facility, they would be more willing to consider it.	-0.9	1.2
30. Citizens should have their own experts.	0.8	0.4
31. We would all be better off if the legal procedures were easier to follow.	0.6	0.7
32. Government shouldn't be trusted in making siting decisions.	-0.0	-0.4

TABLE 3 (CONTINUED)

TYPAL ARRAY Z-SCORES

Statements	z-Scores	
	Factor A	Factor B
33. Government uses citizen opinion against them.	-0.4	-0.8
34. Economic special interests have too much influence in siting decisions.	0.8	-0.4
35. The people living in a community know best what is good for them.	0.4	-0.1
36. Citizens should initially oppose all proposals for siting by industry.	-0.5	-1.8
37. It is better to be active today than to be radioactive tomorrow.	1.2	-0.5
38. If you have enough money, you can get away with polluting.	1.2	-1.5
39. Conflict in decision making is necessary and healthy.	-0.0	1.1
40. Consensus is impossible when activists become involved in environmental decisions.	-0.6	1.2
41. The chief function of government is to support the economy.	-1.3	-0.1
42. Just being physically present in situations where environmental decisions are made is not enough.	0.2	-0.0
43. The siting process is unfair because the results provide greater risks to the people who are ethnically different or poor.	0.6	-1.2
44. Environmental radicals are necessary to bring balance to the issues.	-0.2	-1.7
45. There are clean technologies available that must be used now to reduce pollution.	1.1	1.0
46. Government and industry skew their risk estimates to suit their own purposes.	0.6	0.6
47. Industry must be required to recycle, reduce wastes, and use safer techniques and raw materials.	1.5	0.8

Interpreting the Factors

Each factor was examined within the context of the four NIMBY theories discussed in Chapter 2. The statements were coded according to the theory they best described. The factors were given titles that characterize the perspective represented by the statements which comprise the factor structure.

Factor A: Cynical Citizens

This factor accounts for 43% of the explained variance and describes the perspectives of ten of the 11 citizens actively opposed to the facility. Citizens loading on this factor believe foremost that steps should be taken to reduce or eliminate the need for hazardous waste management facilities. They believe that the risks posed by the facility to human health and the environment are too high.

		A	B
8	We should not take any chances with the environment.	**1.6**	0.2
10	It doesn't matter how much we pollute today because tomorrow's technology will solve the problem.	**-2.3**	-1.2
45	There are clean technologies available that must be used now to reduce pollution.	**1.1**	1.0
47	Industry must be required to recycle, reduce wastes, and use safer techniques and raw materials.	**1.5**	0.8

However, they do not trust industry to act responsibly towards public health and the environment,

		A	B
4	If environmental restrictions limit the ability of a company to make a profit, the restrictions should be relaxed.	**-1.5**	-1.3
14	Government and industry know what they are doing; they are the experts.	**-1.7**	0.8
17	Industry usually complies with environmental laws even when it costs them money.	**-1.4**	0.8
26	Who provides information makes a difference to me; the person must be honest.	**1.0**	2.1
38	If you have enough money, you can get away with polluting.	**1.2**	-1.5

particularly in the absence of governmental regulation, which they believe is prevalent.

16	The government adequately enforces environmental laws to protect human health and safety.	**-1.5**	0.3
18	Environmental laws are full of loopholes for industry advantage.	**1.1**	-0.7
41	The chief function of the government is to support the economy.	**-1.3**	-0.1

They therefore demand to be involved in every step of the siting process.

22	Citizens should be involved in every step of the siting decision.	**1.1**	0.7
37	It is better to be active today rather than to be radioactive tomorrow.	**1.2**	-0.5

They also question the fairness of the siting process, concerned that the costs or risks and benefits associated with hazardous waste facilities are not equally distributed.

1	Waste facility siting means economic growth and prosperity for the community.	**-1.7**	0.4

		A	B
3	When jobs are scarce, an increase in employment is good even if there is resulting pollution.	**-1.7**	-1.7
12	It is better to put facilities in communities with high unemployment; the people there need the jobs.	**-1.3**	-0.9
13	The people who benefit the most from a waste facility are not the ones who bear the risks.	**1.5**	0.2

Factor B: Defenders of the Institution

This factor accounts for 8% of the explained variance and defines the facility proponents, which includes the MMRS representative, the government official, and a citizen/business owner that owned property in the area. These persons believe that siting decisions should be objective and rational,

		A	B
6	Scientific risk assessment should be the major consideration in siting decisions.	-0.3	**1.8**
7	Citizens need to control which risks they have to put up with.	0.8	**-1.0**
2	Offering cash payments to a community is the same as a bribe.	0.3	**-1.6**

and that if citizens had a better understanding of the technical criteria used by experts in designing facilities and selecting sites, they would be more willing to accept them.

28	It is impossible to know whether or not a process is really safe without adequate technical information.	0.1	**1.5**
29	If the public were more familiar with the operation of a waste facility, they would be more willing to consider it.	-0.9	**1.2**

They share a concern for the environment,

		A	B
10	It doesn't matter how much we pollute today because tomorrow's technology will solve the problem.	-2.3	**-1.2**
45	There are clean technologies available that must be used now to reduce pollution.	1.1	**1.0**

and believe that government and industry act responsibly;

4	If environmental restrictions limit the ability of a company to make a profit, the restrictions should be relaxed.	-1.5	**-1.3**

therefore, citizens should trust them to make decisions for the good of society.

25	All information should be shared in easily understood language as soon as it is available.	0.7	**1.2**
26	Who provides information makes a difference to me; the person must be honest.	-0.9	**1.1**

They also believe the existing siting process is fair and equitable,

43	The siting process is unfair because the results provide greater risks to the people who are ethnically different or poor.	0.6	**-1.2**
3	When jobs are scarce, an increase in employment is good even if there is resulting pollution.	-1.7	**-1.7**
38	If you have enough money, you can get away with polluting.	1.2	**-1.5**
11	The world would be a better place to live if we could go back to the good old days.	-0.5	**-1.4**

allowing plenty of opportunity for citizen involvement,

23	Citizens have ample opportunity to be involved in siting decisions in their community.	-0.9	**1.1**
39	Conflict in decision making is necessary and healthy.	-0.0	**1.1**

and that extreme opposition is unwarranted and unproductive.

		A	B
36	Citizens should initially oppose all proposals for siting by industry.	-0.5	**-1.8**
40	Consensus is impossible when activists become involved in environmental decisions.	-0.6	**1.2**
44	Environmental radicals are necessary to bring balance to the issues.	-0.2	**-1.7**

Differences Between Factors

Focusing on those statements which are more than 1 standard deviation apart further reveals just how different the perspectives are (see Appendix E for a complete list). Cynical Citizens and Defenders of the Institution do not agree on the methods for judging risk acceptability,

6	Scientific risk assessment should be a major consideration in siting decisions.	-0.3	1.8
7	Citizens need to control which risks they have to put up with.	0.8	-1.0
29	If the public were more familiar with the operation of a waste facility, they would be more willing to consider it.	-0.9	1.2

or the fairness of the siting process.

1	Waste facility siting means economic growth and prosperity for the community.	-1.7	0.4
43	The siting process is unfair because the results provide greater risks to the people who are ethnically different or poor.	0.6	-1.2

They also cannot come to terms on how much and to what degree citizens should be involved in the decision making process.

23	Citizens have ample opportunity to be involved in siting decisions.	-0.9	1.1

		A	B
37	It is better to be active today than to be radioactive tomorrow.	1.2	-0.5
40	Consensus is impossible when activists become involved in environmental decisions.	-0.6	1.2

Their strongest point of disagreement, however, is over institutional trust; not trust in general, but specific trust in industry and government to make sound environmental decisions. Defenders of the Institution believe they should be trusted to make environmental decisions, while Cynical Citizens believe otherwise.

16	The government adequately enforces environmental laws to protect human health and the environment.	-1.5	0.3
17	Industry usually complies with environmental laws even when it costs them money.	-1.4	0.8
18	Environmental laws are full of loopholes for industry advantage.	1.1	-0.7
38	If you have enough money, you can get away with polluting.	1.2	-1.5

Similarities Between Factors

There are 22 consensus statements (see Appendix F for a complete list), four of which are salient (z-score >1.0). Cynical citizens and Defenders of the Institution agree that the environment should be protected and that economic justification is not acceptable.

3	When jobs are scarce, an increase in employment is good even if there is resulting pollution.	-1.7	-1.7
4	If environmental restrictions limit the ability of a company to make a profit, the restrictions should be relaxed.	-1.5	-1.3

		A	B
45	There are clean technologies available that must be used now to reduce pollution.	1.1	1.0
47	Industry must be required to recycle, reduce wastes, and use safer techniques and raw materials.	1.5	0.8

Decision Criteria Card Sort Data

The frequency distributions for the decision criteria card rankings for opponents and proponents are presented in descending order in Tables 4 and 5, respectively. The respondents ranked the cards in order of their relative perceived importance.

While it is easy to identify which decision criteria are important and which are unimportant by simply looking at the Tables, more can be learned by studying the groupings of criteria. For example, in Table 4 a discernible break lies between community disruption and technical/legal education. Not surprisingly, the nine criteria in the top group all reflect personal (subjective) and community concerns. The bottom group, which is of little or no importance to opponents, pertains to technical concerns.

In Table 5, a distinction can also be made between technical/legal education and alternative technologies. Again, notice that objective criteria in the top group ranked as most important, whereas citizen concerns rank in the bottom group.

Clearly, opponents and proponents do not agree on what is important in siting decisions. But, just how far apart they are and on what issues become dramatically apparent when comparing the results of the two tables. Specifically, citizens regard personal risk judgments, citizen involvement, and alternative technologies as very important, while proponents believe quite the opposite. They instead prefer that decisions be based on economic impacts. Not surprisingly, citizens ranked company economics dead last.

TABLE 4

FREQUENCY DISTRIBUTION OF DECISION CRITERIA CARD RANKINGS (OPPONENTS)

	Frequency Distribution (Importance)		
Criterion	**Highly**	**Somewhat**	**Not**
Understanding Local Culture	8	1	2
Personal Risk Judgments	7	3	1
Access to Information	7	2	2
Citizen Involvement	6	4	1
Alternative Technologies	6	4	1
Fairness	5	6	0
Institutional Trust	5	4	2
Community Economics	5	4	2
Community Disruption	5	3	3
Technical/Legal Education	3	5	3
Views Towards Technology	1	7	3
Scientific Risk Estimates	1	5	5
Company Economics	0	4	7

TABLE 5

FREQUENCY DISTRIBUTION OF DECISION CRITERIA CARD RANKINGS

(PROPONENTS)

Criterion	Frequency Distribution (Importance)		
	Highly	Somewhat	Not
Company Economics	3	0	0
Community Economics	3	0	0
Fairness	3	0	0
Institutional Trust	2	1	0
Access to Information	2	1	0
Understanding Local Culture	2	1	0
Scientific Risk Estimates	2	0	1
Technical/Legal Education	1	2	0
Alternative Technologies	1	1	1
Community Disruption	1	1	1
Citizen Involvement	1	1	1
Personal Risk Judgments	0	2	1
Views Towards Technology	0	1	2

Participation Strategy Card Sort Data

Tables 6 and 7 present the rank order of participation strategies in descending order for both opponents and proponents, respectively.

Opponents strongly favor participation strategies that empower them. In fact, they almost exclusively prefer public referendum, followed closely by an oversight board and citizen control. Their next choices are binding arbitration and third party mediation, which involve sharing power. The remaining

strategies are ranked according to the amount of power they afforded citizens. Thus, preemption was ranked last. It is interesting to note that the current approach, public comment, is not highly regarded.

TABLE 6

FREQUENCY DISTRIBUTION OF PARTICIPATION STRATEGY CARD RANKINGS (OPPONENTS)

	Frequency Distribution (Importance)		
Criterion	**Highly**	**Somewhat**	**Not**
Referendum	10	1	0
Oversight Board	8	2	1
Citizen Control	6	3	2
Binding Arbitration	4	6	1
Third Party Mediation	4	6	1
Public Comment	3	8	0
Consultation	3	5	3
Non-Binding Negotiation	2	4	5
Preemption	0	3	8

Proponents, however, are split on their choice of participation strategies. While all favor a strategy of limited citizen involvement, the government official and the MMRS representative prefer the current public comment approach. The citizen/business owner rejected this strategy in support of an oversight board. All three proponents did agree that preemption and citizen control are not preferred. Their rankings suggest that they did not want sole power, nor did they want to give up power.

TABLE 7

FREQUENCY DISTRIBUTION OF PARTICIPATION STRATEGY CARD RANKINGS (PROPONENTS)

Criterion	Frequency Distribution (Importance)		
	Highly	Somewhat	Not
Public Comment	2	0	1
Consultation	1	1	1
Third Party Mediation	1	1	1
Oversight Board	1	1	1
Non-Binding Negotiation	1	0	2
Referendum	1	0	2
Binding Arbitration	0	1	2
Preemption	0	1	2
Citizen Control	0	0	3

CHAPTER VI

DISCUSSION AND CONCLUSIONS

Three major findings resulted from this study. First, overall support was found for Armour's (1991) propositions that differences between facility proponents and opponents in risk perception, sense of control, fairness, and institutional trust contribute to siting policy gridlock. Second, opponents did not harbor feelings of broad institutional distrust prior to the dispute as had been found in other studies on public opposition (Kasperson et. al. 1992; Pijawka and Mushkatel 1991). Third, civic parochialism, while not specifically identified as a hypothesis in Chapter 2, but believed to be a key aspect of NIMBY (DuPont 1981; Kraft and Clary 1991), was not prevalent among opponents. This chapter carefully reviews each of these findings.

Test of Armour's Propositions

Proposition 1: Differences in risk perception lead to gridlock

There is strong evidence to support this proposition, particularly in the decision criteria card ranking data. As illustrated in Tables 4 and 5, opponents and proponents disagreed on the role of personal risk judgments and scientific

risk estimates in siting decisions. Opponents believed that personal risk judgments should be most important, whereas proponents preferred the use of scientific risk estimates. This difference was complicated by the fact both sides all but rejected the other's preference.

A disparity in risk preference is also found in the Q sort results. For example, proponents most agreed with the statement "scientific risk assessment should be a major consideration in siting decisions" (Statement #6), while opponents most agreed with the statement "we should not take any chances with the environment" (Statement #8). These results suggest that proponents were more willing to accept risk whereas opponents were uncomfortable with risk, particularly with scientific estimates of it.

Clearly, opponents and proponents did not attach the same importance to different constructions of risk, at least not in respect to siting hazardous waste facilities. Opponents were more risk averse, where proponents were more risk tolerant. It is this fundamental difference in opinion that contributed to the siting gridlock.

Proposition 2: Differences in social trust of institutions lead to gridlock

The results reveal mixed support for this proposition. The interviews and the Q sort data show that opponents distrusted MMRS (Statements #4, #17, #18 and #38) and OSDH (Statements #14, #16, and #18) insofar as environmental enforcement and competence were concerned. This seems to indicate the

existence of a wariness on the part of opponents concerning deference to OSDH and MMRS to protect their environmental and health interests. Interestingly, however, government was not distrusted to make siting decisions (Statement #32). The interviews confirmed this sense of cautious trust of government and industry with respect to protection of human health and the environment. This suggests while trust may have contributed to siting decision gridlock, it was not the initial cause of the MMRS siting opposition. A more in-depth discussion of this finding is presented later in this chapter.

Proposition 3: Differences in perceived fairness of the distribution of costs and benefits lead to gridlock

Opponents and proponents disagreed on the fairness of the siting proposal, even though the Q sort (Statements #3 and #12) and decision criteria card sort results (Tables 4 and 5) show they agreed that fairness should be important in siting decisions.

Proponents maintained that the existing siting process was equitable and would have fairly distributed risks, costs, and benefits within the community (Statement #43). Everyone, in their opinion, stood to benefit from the facility, including themselves, the citizens in and around Haystack, and society in general.

Opponents, on the other hand, thought the siting process was unfair (Statement #43) and that only MMRS would truly benefit (Statements #1 and

#13). They believed they were "singled out" to host the facility for reasons other than what MMRS claimed. The following citizen quote accurately summarizes their concerns:

> *"The company (MMRS) claimed that they picked Haystack because of the soil conditions, and stuff like that. I think they picked us because they didn't think we'd get organized and fight. We argued with them and showed them evidence that the area had sink holes and was no good, but they just wouldn't listen. They only cared about the money they could make and not us."*

Proposition 4: Differences in sense of control lead to gridlock

The results provide for support this proposition. Frustrated with the inability to change what seemed to be an inevitable siting, opponents experienced feelings of loss of control. These feelings were clearly articulated in the interviews, as illustrated by the following quote:

> *"We didn't have any control over what was happening. We met with them (proponents) several times but the never paid heed to what we were saying."*

This led opponents to judgments that MMRS and OSDH could not be fully trusted to make facility siting decisions. For this reason, they appealed outside of the normal siting process to the state legislature, which set the stage for siting gridlock.

Diffuse vs Specific Trust

The mixed results with respect to institutional trust can be explained by reference to David Easton's (1965) distinction among types of support. Easton

posits that in a political system authorities must have the support of society if they are to avoid difficulties in implementing their decisions. He identifies two types of support, specific and diffuse. Specific support is that which "flows from the favorable attitudes and predisposition stimulated by outputs that are perceived by [citizens] to meet their demands as they arise or in anticipation", and general, or diffuse support, is "a reservoir of favorable attitudes or good will that helps [citizens] to accept or tolerate outputs to which they are opposed or the effect of which they see as damaging to their interests" (1965:273). By applying his observations, and substituting the word "trust" for "support," an interesting insight into the trust results in this case study can be gained.

The similarities in diffuse trust between opponents and proponents after the siting controversy suggest that the differences in trust probably evolved during the conflict as different judgments of specific trust of the siting process itself. Specific distrust among opponents was generated by the failure of decision makers to address their expectations, or concerns, regarding sense of control, perceptions of risk, and fairness, coupled with an attempted exclusion of opponents from the decision making process. This may explain why opponents expressed distrust in OSDH in making the MMRS siting decision, but still trusted government siting decision making in general.

NIMBY vs NIABY

Noticeable from the results is a lack of civic parochialism. While opponents in Haystack expressed in the interviews that they did not want to bear the risks for industrial development, they also did not want anyone else to bear the risks. They think government and industry should find technological alternatives instead of alternative sites (Statements # 8, 10, 45 and 47). In fact, they rank alternative technologies high on the list of criteria most important to them in making siting decisions (Table 4).

Until these new technologies can be employed, opponents favor management of hazardous waste at the point of generation. As one respondent put it, "companies should be forced to keep their waste at their plant and not dump it on communities." This finding is more consistent with Heiman's (1990) argument that local resistance to facility siting is not necessarily a parochial "Not in my backyard!" response, but rather a "Not in *anybody's* backyard!" (NIABY) response. He argues that citizens everywhere are now beginning to focus on whether facilities are needed instead of where they should be located.

Conclusions

The findings of this research suggest (but do not confirm due to a lack of longitudinal data) that opposition in Haystack intensified over time and that

gridlock could have been prevented at several points in the siting decision process.

The risk event that triggered the controversy was MMRS's proposal to site a hazardous waste management facility in Haystack. This proposal caused citizens to ask themselves and each other about the nature of the impacts that may result and wondered whether they could be adversely affected. As they discussed these impacts, they became more and more concerned. They began to attend meetings at which their fears grew and their risk perception increased.

Later, concerned citizens began to ask why MMRS was proposing to locate the facility in Haystack when the wastes were being generated in Oklahoma City and other industrial areas of the state. The "why here?" question triggered further concern and opposition among those who questioned the fairness of locating the facility in their community.

The more the citizens learned about the facility and hazardous waste management in general, they began to question the need for the facility anywhere. Some citizens thought there were plenty of alternatives to waste disposal that should be investigated first, such as recycling, source reduction, and other similar waste minimization technologies.

After a series of meetings and a few months had passed, citizens began to wonder whether OSDH cared about their concerns. It became apparent that the proponents were determined to find a way to overcome local opposition and site the facility. The government, it seemed, was indifferent to the opponents'

concerns. When this became obvious, citizens began to feel that they had lost their ability to influence the siting decision and that they no longer could control their own destiny.

Despite repeated attempts by opponents to raise issues that they believed would call into question the wisdom of siting the facility, the government pursued its permitting process. The citizens believed the government should have represented their interests and were disappointed that OSDH seemed to be siding with MMRS. This damaged the reservoir of trust that existed prior to the siting proposal.

Now that trust had eroded, it was clear that citizens needed to take matters into their own hands. They finally found allies in the State Legislature who empathized with their plight and championed a bill which placed a year-long moratorium on siting until the OSDH siting rules could be reviewed and revised. As reported in Chapter 3, the end result of these and subsequent efforts permanently stalled the siting effort - gridlock!

Successful siting may have been accomplished had the proponents and government not facilitated the intensification of the conflict to the point of producing gridlock. Their failure to recognize the legitimacy of opponents' concerns allowed the evolution of the controversy to gridlock.

Lessons to be learned: What should have been done?

There was not much more that MMRS could have done, short of withdrawing their proposal, to reduce the risk beyond that posed by the facility.

Equity could have been addressed by moving some of the jobs and other benefits associated with the waste generating activities to the community. In addition, compensation packages, such as tax relief or in kind payments, which would have provided benefits to offset risks could have been offered.

Need could have been addressed by demonstrating that technologies are not (yet) available to completely eliminate the need for disposal facilities. Assurances would have been necessary, of course, to show that generators were doing what they could do to reduce the quantity of waste generated.

A measure of control could have been given to the community through contracts and agreements between the community and MMRS which would have allowed the community to oversee facility operations, suggest design modifications, limit unit capacity and the period of operation, and to provide financial assurances of safe closure and cleanup.

Had these remedies been implemented, it is likely that trust would not have been eroded. The legitimization of citizens' interests would have demonstrated that the company and OSDH shared their concerns and verified that they were not being ignored or marginalized. The facility, as the following citizen quote indicates, might then have been accepted;

> *"The site could have come in if MMRS had approached us differently."*

BIBLIOGRAPHY

Armour, A. M. 1991. *The Siting of Locally Unwanted Land Uses: Towards a Cooperative Approach.* New York: Pergammon Press.

Ashford, N. 1988. "Science and Values in Regulatory Process," *Statistical Science* 3:377-83.

Bachrach, K. M., and A. J. Zautra. 1985. "Coping With a Community Stressor: The Threat of a Hazardous Waste Facility," *Journal of Health and Social Behavior* 26:127-41.

Bord, R. J., and R. E. O'Connor. 1992. "Determinants of Risk Perception of a Hazardous Waste Site," *Risk Analysis* 12:411-16.

Brown, S. R. 1980. *Political Subjectivity: Applications of Q-Methodology in Political Science.* Westford, MA: Murray Printing Company.

Carlisle, T. Oct. 21, 1984. "Toxic Waste Dump Meeting Gathers 400," *The Sayre Journal* 51(84):1.

Carr, S. C. 1989. "The Use and Interpretation of the Q-Technique Factor Analysis." Presented at the annual meeting of the Southwest Educational Research Association. ERIC Document Reproduction Service no. ED 306 297.

Covello,V. T. 1983. "The Perception of Technological Risks: A Literature Review," *Technology Forecast and Social Change* 23:285-97.

Douglas, M., and A. Wildavsky. 1982. *Risk and Culture.* Berkeley: University of California Press.

Duffy, C. P. 1984. "State Hazardous Waste Facility Siting: Easing the Process Through Local Cooperation and Preemption," *Environmental Affairs* 11:755-804.

DuPont, R. L. September 7, 1981. "The Nuclear Power Phobia." *Business Week* 14-16.

Easton, D. 1965. *A Systems Analysis of Political Life*. New York: John Wiley and Sons, Incorporated.

Edelstein, M. 1988. *Contaminated Communities: The Social and Psychological Impacts of Residential Toxic Exposure.* Boulder, CO: Westview Press.

Fessenden-Raden, J., J. Fitchen, and J. Heath. 1987. "Providing Risk Information in Communities: Factors Influencing What is Heard and Accepted," *Science Technology and Human Values* 12 (3,4):94-101.

Fischoff, B., P. Slovic, and S. Lichtenstein. 1983. "The 'Public' vs. the 'Experts': Perceived vs. Actual Disagreements About Risks of Nuclear Power," In *Analysis of Actual Versus Perceived Risk.* eds. J. Rodericks and R. Tardiff. NewYork: Plenum.

Focht, W. J. 1992. "The Role of Risk Judgment in Predicting Political Participation." Master of Art Thesis, Oklahoma State University, Stillwater, OK.

Focht, W. J. 1995. "A Heuristic Inquiry into NIMBY Conflict: Exploring Solutions to Gridlock." Ph.D. Dissertation, Oklahoma State University, Stillwater, OK.

Folk, E. 1991. "Public Participation in the Superfund Cleanup Process," *Ecology Law Quarterly* 18:173-221.

Heiman, M. 1990. "From 'Not in My Backyard!' to 'Not in Anybody's Backyard!': Grassroots Challenge to Hazardous Waste Facility Siting," *Journal of American Planning Association* 359-362.

Hodges-Koppel, J. 1987. "State Roles in Siting Hazardous Waste Facilities," *Forum for Applied Research and Public Policy* 2(3):78-88.

Inhaber, H. 1992. "Of LULUs, NIMBYs and NIMTOOs," *The Public Interest* 107:52-64.

Kasperson, R. E. 1986. "Six Propositions on Public Participation and Their Relevance for Risk Communication," *Risk Analysis* 6:275-81.

Kasperson, R. E., D. Golding, and S. Tuler. 1992. "Social Distrust as a Factor in Siting Hazardous Facilities and Communicating Risks," *Journal of Social Issues* 48(4):161-87.

Kasperson, R. E., O. Renn, P. Slovic, H. S. Brown, J. Emel, R. Goble, J. X. Kasperson, and S. Ratick. 1988. "The Social Amplification of Risk: A Conceptual Framework," *Risk Analysis* 8:177-187.

Kraft, M. E., and B. B. Clary. 1991. "Citizen Participation and the NIMBY Syndrome: Public Response to Radioactive Waste Disposal," *Western Political Quarterly* 44(2):299-328.

Kraft, M. E. 1994. "Searching for Policy Success: Reinventing the Politics of Site Remediation," *Environmental Professional* 16:245-53.

Kunreuther, H., D. Easterling, W. Desvousges, and P. Slovic. 1990. "Public Attitudes Toward Siting a High Level Nuclear Waste Repository in Nevada," *Risk Analysis* 10(4):469-84.

Lake, R. W., ed. 1987. *Resolving Locational Conflict.* New Brunswick, NJ: Transaction Publishers, Rutgers, Center for Urban Policy Research.

Lawler, J. J., and W. J. Focht. 1989. "Risk Communication and Citizen Participation Under Superfund, Title III; Strategies for Reconciling Citizen Participation with Technical Opinion Under the Emergency Planning and Community Right-To-Know Act." Presented at the annual meeting of the Southwestern Political Science Association, Little Rock.

Lawler, J. J., W. J. Focht, and E. L. Hatley. 1992. "Citizen Participation in Hazardous Waste Controversies: NIMBY and Beyond," *National Social Science Perspectives Journal* 7:61-75.

Lipset, S. M., and W. Schneider. 1983. *The Confidence Gap.* New York: The Free Press.

The Mangum Star-News. Jan. 12 & 19, 1984. *Affidavit of Publication.*

Matheny, A. R., and B. A. Williams. 1985. "Knowledge Vs. NIMBY: Assessing Florida's Strategy for Siting Hazardous Waste Disposal Facilities," *Policy Studies Journal* 14(1):70-80.

Mitchell, R. C., and R. T. Carson. 1986. "Property Rights, Protest, and the Siting of Hazardous Waste Facilities," *American Economic Review* 76:285-90.

Morell, D., and C. Magorian. 1982. *Siting Hazardous Waste Management Facilities.* Cambridge, MA: Ballinger.

Oklahoma Department of Environmental Quality. September 1985. *Fact Sheet: Haystack Disposal Facility.*

O'Hare, M. 1977. "Not On My Block You Don't: Facility Siting and the Strategic Importance of Compensation," *Public Policy* 25:407-58.

O'Hare, M., L. Bacow, and D. Sanderson. 1983. *Facility Siting and Public Opposition.* New York: Van Nostrand Reinhold Company.

Otway, H. 1987. "Risk Communication and Democracy," *Risk Analysis* 7:125-9.

Otway, H., and D. von Winterfeldt. 1982. "Beyond Acceptable Risk: On the Social Acceptability of Techologies," *Policy Sciences* 14:247-56.

Pijawka, K. D., and A. H. Mushkatel. 1991. "Symposium on the Development of Nuclear Waste Policy: Siting the High-Level Nuclear Waste Repository," *Policy Studies Review* 10(4):88-194.

Popper, F. J. 1981. "Siting LULUs," *Planning* 47(4).

Portney, K. E. 1986. "The Perception of Health Risk and Opposition to Hazardous Waste Treatment Facility Siting: Implications for Hazardous Waste Management and Policy from Survey Research." In *Papers and Proceedings of the Applied Geography Conferences* 9:114-23.

Portney, K. E. 1991. *Siting Hazardous Waste Treatment Facilities: The NIMBY Syndrome.* New York: Auburn House.

Rayner, S., and R. Cantor. 1987. "How Fair is Safe Enough? The Cultural Approach to Societal Technology Choice," *Risk Analysis* 7(1):3-9.

Rubin, N. 1986. *Probability Times Consequences: Rational and Scientific, or Just Imprudent?* Toronto: Pollution Probe.

Slovic, P. 1986. "Informing and Educating the Public About Risk," *Risk Analysis* 4(4):403-415.

Slovic, P. 1987. "Perception of Risk," *Science* 236:80-5.

Slovic, P. 1993. "Perceived Risk, Trust, and Democracy," *Risk Analysis* 13(6):675-82.

Slovic, P., B. Fischoff, and S. Lichtenstein. 1984. "Perception and Acceptability of Risk from Energy Systems." In *Public Reaction to Nuclear Power: Are there Critical Masses?"*, ed W. R. Freudenburg and E. Rosa. Boulder, CO: Westview.

Tversky, A., and D. Kahneman. 1981. "The Framing of Decisions and the Psychology of Choice," *Science* 211:453-58.

Van Tubergen, G. N. 1975. *QUANAL Users' Guide*. Lexington: Department of Communication, University of Kentucky.

Vlek, C., and P. Stallen. 1980. "Rational and Personal Aspects of Risk," *Acta Psychologica* 45:273-300.

Weinstein, N. 1984. "Why It Won't Happen To Me," *Health Psychology* 3:431-57.

Wildavsky, A., and K. Dake. 1990. "Theories of Risk Perception: Who Fears What and Why?" *Daedalus* 119(4):41-61.

Wynne, B. 1983. "Redefining the Issue of Risk and Public Acceptance : The Social Viability of Technology," *Futures* 15(1):13-32.

Wynne, B. 1992. *Risk and Social Learning: Reification to Engagement in Social Theories of Risk.* eds S. Krimsky and D Golding. Westport CT Praeger.

APPENDIXES

APPENDIX A

STRUCTURED QUESTIONNAIRE

STRUCTURED QUESTIONNAIRE

Relationships and Roles in the Haystack Situation

The following 8 questions concern the situation that existed in the Haystack area.

1. What relationship did you have with the Haystack area at the time of the situation?

   [ ] I lived in the Haystack area
   [ ] A member of my family lived in the Haystack area
   [ ] I own property in the Haystack area but did not live there
   [ ] My children went to school in the Haystack area
   [ ] I visited a park in the Haystack area
   [ ] Other (specify)

   _____

2. From what sources did you get information about the situation? CHECK ALL THAT APPLY

   [ ] News media
   [ ] Friends and neighbors
   [ ] MMRS
   [ ] Environmental groups such as the National Toxics Campaign
   [ ] Fellow workers at my place of employment
   [ ] HEGI
   [ ] US EPA
   [ ] Oklahoma State Department of Health
   [ ] Local government
   [ ] Other (specify)

   _____

3. Which of the sources listed in Question #2 did you most rely on and trust? LIST TOP 3 IN ORDER.

   Most Important:_____
   Second Most Important: _____
   Third Most Important:_____

Why? (Explain these choices)

4. Which of the sources listed in Question #2 did you least rely on and trust?

LIST BOTTOM 3 IN ORDER.

Least Important:_____
Next to Least Important:_____
Third Least Important:_____

Why? (Explain these choices)

5. How would you describe your participation in the situation at that time? CHECK ALL THAT APPLY

[ ] I did not participate
[ ] I signed a petition
[ ] I contacted a government official
[ ] I attended a meeting of concerned citizens
[ ] I spoke at a meeting of concerned citizens
[ ] I helped organize a meeting of concerned citizens
[ ] I attended a government meeting or public hearing
[ ] I testified at a government meeting or public hearing
[ ] I participated in a rally or demonstration
[ ] I helped organize a rally or demonstration
[ ] Other (specify)

_____

6. How often did you participate?

[ ] Never [ ] Seldom [ ] Occasionally
[ ] Frequently [ ] Continuously

7. At the time of the situation, what relationship, if any, did you have with the group known as Haystack Environmental Group, Incorporated (HEGI)?

[ ] I didn't know anything about HEGI and had no dealings with them
[ ] I knew about HEGI but I had no dealings with them
[ ] I attended at least one HEGI meeting or other function sponsored by them but I never became an active supporter or member
[ ] I was an active supporter or member of HEGI
[ ] Other (specify)

_____

8. What relationship did you or a family member have with MMRS before or during that period?

[ ] I/family member had no employee or business relationship with MMRS before or during the period of the situation
[ ] I/family was a MMRS employee during at least some of the period of the situation
[ ] I/family was a MMRS employee before the situation began but not during it
[ ] I/family had a non-employee business relationship with MMRS during at least some of the period of the situation
[ ] I/family had a non-employee business relationship with MMRS before the situation began but not during it
[ ] Other (specify)

_____

APPENDIX B

OPEN-ENDED INTERVIEW SCRIPT

OPEN-ENDED INTERVIEW SCRIPT

1. How long have you lived in the Haystack area?

2. Let's talk about the MMRS siting situation. I am interested in your opinions and recollections of events that occurred then. I understand that you played an active role, is that correct?

3. About when did you get involved?

    - For what reasons?
    - Which of these is most important?
    - Who was most responsible for influencing your involvement?

4. What were your concerns about the siting of a hazardous waste facility in your community?

5. At the time of the siting situation there were some people who agreed with the siting proposals and some who disagreed. What things about the siting do you think most people agreed on?

6. I want to ask you now about how things have changed in the community since the time you were active in the situation. How would you say things have changed in your community economically since then?

7. How have things changed insofar as your sense of community; in other words, how you view your community as a place to live and what it means to you?

    - Has the sense of community become stronger?

8. Have there been any other proposals to site a hazardous waste facility in your county? If so, did you feel more or less able to effectively respond to the proposal?

9. Let's talk about government's dealings with the siting.

   What things did EPA, OSDH, and local government officials do right in presenting the proposal to the community?

   - What do you believe they might have done wrong?

10. What things did MMRS officials do right in presenting the proposal to the community?

    - What do you believe they might have done wrong?
    - What do you believe MMRS could have done in order to best serve all members of the community?

11. What things did citizens do right in dealing with the siting proposal?

    - What do you believe might have been done wrong?
    - Is there anything the citizens could have done to act in the best interest of all community members?

12. Is there anything else that you would like to tell me about your feelings, concerns, or suggestions about the Haystack situation or about hazardous waste sitings in general that we haven't covered so far?

APPENDIX C

DECISION CRITERIA CARDS

DECISION CRITERIA CARDS

CARD 1: Fairness

Even though a decision may produce a community benefit when all costs and benefits are added up, some citizens or neighborhoods may experience more harm than good and other citizens or neighborhoods may experience more good than harm. Some people may consider that an unequal distribution of costs, benefits, and risks in a community is unfair.

I believe that the fairness of the distribution of benefits, costs, and risks should be important in making community environmental siting decisions.

CARD 2: Understanding Local Culture

Communities vary in their traditions, customs, values, attitudes and identities. Decisions that can affect a community may require that decision makers be knowledgeable about the local culture. Since different communities and regions of the nation have different cultures, it is not always easy to know what local values may be.

I believe that an adequate consideration of the local community's culture and values should be important in making community environmental siting decisions

CARD 3: Technical and Legal Education

Decisions about siting hazardous waste facilities involve various technical and legal issues. Technical issues may include the proper measurement of long term health risks, whether a technology will operate as it was designed, and what the odds are of a plant upset or spill that would result in a major environmental threat to the community. Legal issues may include how to understand complicated laws and regulation and what procedures apply in the decision making process. Many of these issues are difficult to understand without technical and legal education.

I believe that assurance of adequate training in relevant technical and legal areas should be important in making community environmental siting decisions.

CARD 4: Trust in Government and Industry

Trust has different meanings. For example, acting in the community's best interest (being a good neighbor), credibility (truthfulness, believability), and openness (accessibility, forthrightness), may each be important to judgments about whether a person or organization is trustworthy.

I believe that citizens' level of trust in government and industry should be important in making community environmental siting decisions.

CARD 5: Community Disruption

Environmental siting activities may disrupt the normal flow of a community. For example, rerouting of traffic, separation of one neighborhood from another, and loss of reputation may cause a decline in a sense of community and an interruption of long-held traditions.

I believe that consideration of the potential for community disruption should be important in making community environmental siting decisions.

CARD 6: Alternative Technologies

It used to be commonplace to dispose of waste by dumping it into landfills and open pits. Recently, there have been efforts to find alternatives to land disposal. One approach is to develop new manufacturing techniques that do not generate toxic waste, for example, by recycling wastes back into the process and by using less dangerous raw materials. For those toxic wastes that cannot be eliminated, new and innovative waste treatment methods are being developed that can convert them into non-toxic forms without creating emissions or discharges to the environment.

I believe that preference for alternative technologies such as recycling and non-emitting waste treatment should be important in making community environmental siting decisions.

CARD 7: Citizen Involvement

Some citizens choose to become actively involved in decisions that affect their community or them personally. The amount of involvement not only depends on their willingness and ability to participate, but also on the opportunities that the decision process offers for participation.

I believe that the provision of adequate opportunities for citizen involvement should be important in making community environmental siting decisions.

CARD 8: Economic Impact on the Community

Community environmental siting decisions can affect the economic health of the community. Economic benefits could include creation of jobs; increase in tax revenue; compensation in the form of cash payments; and improvements to parks, libraries, schools, or hospitals. Economic costs could include loss of tourism, change in land use, traffic disruption, and increases in demand for community services.

I believe that economic impact on the community should be important in making community environmental siting decisions.

CARD 9: Personal Judgments of Risk

People often make judgments about whether to accept or avoid risks. Factors that may be important in judging environmental risk include personal familiarity and understanding of the risk involved, whether the risks are voluntary and controllable, whether experts agree on the amount of risk, whether children or future generations are affected, and whether the risks are reversible or have delayed effects.

I believe that citizens' judgments of risk should be important in making community environmental siting decisions.

CARD 10: Economic Impact on the Company

Private companies want to make a profit to stay in business. Ability to make a profit can be affected by various costs, including costs of environmental remediation, compliance with regulations, construction and operation, legal liability, compensation payments to the community, and limits on how the company may operate.

I believe that a company's ability to make a profit should be important in making community environmental siting decisions.

CARD 11: Access to Information

The ability to easily obtain relevant information in a timely manner and in an understandable way can help people make informed decisions. This is especially true if the decision involves complex issues where it is important to consider all the facts.

I believe that assurances of citizens' timely access to relevant information should be important in making community environmental siting decisions.

CARD 12: Scientific Risk Estimates

Scientific experts in government and industry claim that they can scientifically measure risk to human health and the environment. To estimate the risk that may result from a harmful event, they multiply the seriousness of the potential harm by how likely it is that the harm may happen.

I believe that scientific risk assessments should be important in making community environmental siting decisions.

CARD 13: Personal Views Toward Technology

Some people claim that continuing advances in technology are important to improving quality of life. Others question whether reliance on technology is always a good thing. For example, some people believe that some technologies create more harm than good and should not be used.

I believe that citizens' views toward technology should be important in making community environmental siting decisions.

APPENDIX D

PARTICIPATION STRATEGY CARDS

PARTICIPATION STRATEGY CARDS

CARD 1: Consultation

Government conducts public meetings, distributes information, conducts surveys, and asks for comments throughout the siting process. Government considers all public comments before making siting decisions.

I believe that community environmental siting decisions should be made by government, but the public should be allowed to voice its concerns throughout the entire decision making process.

CARD 2: Non-Binding Negotiation

Company officials are required to enter into preliminary negotiations with citizen representatives of the community. Any agreement that may be reached will be delivered to government decision makers for their consideration. However, the siting decision will be made by the government. Its decision may or may not include any or all of the agreement.

I believe that citizens of a community and the company should be allowed to try to reach an agreement before the government makes a community environmental siting decision.

CARD 3: Third Party Mediation

A neutral third party attends all meetings between citizen representatives of the community and the company concerning environmental siting decisions. The mediator attempts to help the parties to reach an agreement. The agreement is then forwarded to the government for their consideration; however, the government is free to include none, part, or all of the agreement in its decisions.

I believe that a mediated agreement between the community and the company should be reached before the government makes a community siting decision ; however, the government may pick and choose which, if any, parts of the agreement to include in its decision.

CARD 4: Binding Arbitration

A fixed period of time (e.g., one year) is provided to allow community and industry representatives to try to reach a voluntary agreement on siting the facility. If no agreement is reached during this time, an experienced arbitrator will consider the positions of both parties and develop a document that binds both parties. Industry is require to pay for, but the citizens select, the arbitrator. Subject to verification of the legality, the government is required to attach the agreement to its permit and enforce it as part of its oversight duties

I believe that an independent arbitrator should be brought in to resolve disputes between citizens and industry concerning siting decisions and that government should be required to enforce the arbitrator's decisions.

CARD 5: Oversight Board

An oversight board composed of an equal number of citizens (selected by a consensus of public interest groups in the community), industry representatives, and government representatives provides continuous control of the entire decision making process. All parties agree to abide by the oversight board's decisions.

I believe that an oversight board, composed of equal numbers of representatives from government, industry, and self-selected citizens, should be used to oversee the entire decision making process concerning siting decisions.

CARD 6: Referendum

Any siting decision must be approved by a vote of the majority of the community before it can take effect.

I believe that siting decisions should be approved by a majority vote of the citizens of a community before they can take effect.

CARD 7: Citizen Control

The community itself controls the siting decision process. A citizens' committee, whose representatives are chosen by members of various environmental, community action, neighborhood development, and other citizens' groups, make all decisions. The government and industry are bound by the decisions of the committee and must provide whatever funds are necessary to comply with the decisions of the committee.

I believe that siting decisions should be made solely by the citizens of a community and that industry and government should be bound by those decisions.

CARD 8: Preemption

The expertise of government officials is relied on to make siting decisions. The public is effectively excluded from participating directly in the decision making process.

I believe that siting decisions should be made by experts in government and industry.

CARD 9: Public Comment and Hearing

The government makes a tentative siting decision, announces it to the public, considers comments received from the public, and then makes a final decision.

I believe that siting decisions should be made by the government, but only after the public has had a chance to comment on the proposals.

APPENDIX E

DESCENDING ARRAY OF DIFFERENCES BETWEEN FACTORS

Descending Array of Differences Between Factors

	Factor A	Factor B	Difference
38. If you have enough money, you can get away with polluting.	1.2	-1.5	**2.7**
2. Offering cash payments to a community is the same as a bribe.	0.3	-1.6	**1.9**
43. The siting process is unfair because the results provide greater risks to the people who are ethnically different or poor.	0.6	-1.2	**1.8**
18. Environmental laws are full of loopholes for industry advantage.	1.1	-0.7	**1.8**
7. Citizens need to control which risks they have to put up with.	0.8	-1.0	**1.8**
37. It is better to be active today than to be radioactive tomorrow	1.2	-0.5	**1.7**
44. Environmental radicals are necessary to bring balance to the issues.	-0.2	-1.7	**1.5**
8. We should not take any chances with the environment.	1.6	0.2	**1.4**
13. The people who benefit the most from a waste facility are not the ones who bear the risk.	1.5	0.2	**1.3**
36. Citizens should initially oppose all proposals for siting by industry.	-0.5	-1.8	**1.3**
34. Economic special interests have too much influence in siting decisions.	0.8	-0.4	**1.2**
11. The world would be a better place to live if we could go back to the good old days.	-0.5	-1.4	**0.9**
20. Allowing a waste facility to locate in a community divides a community.	0.5	-0.2	**0.8**
47. Industry must be required to recycle, reduce wastes, and use safer techniques and raw materials.	1.5	0.8	**0.7**

Descending Array of Differences Between Factors (continued)

	Factor A	Factor B	Difference
15. Cost effectiveness is more important to industry and government than environmental issues.	0.3	-0.3	**0.6**
35. The people living in a community know best what is good for them	0.4	-0.1	**0.5**
30. Citizens should have their own experts.	0.8	0.4	**0.5**
33. Government uses citizen opinion against them.	-0.4	-0.8	**0.5**
22. Citizens should be involved in every step of a siting decision.	1.1	0.7	**0.4**
19. The character of a community changes after a waste facility is located there.	0.1	-0.3	**0.4**
32. Government shouldn't be trusted in making siting decisions.	-0.0	-0.4	**0.3**
21. Waste facilities give a community a bad reputation.	0.5	0.3	**0.2**
42. Just being physically present in situations where environmental decisions are made is not enough.	0.2	-0.0	**0.2**
45. There are clean technologies available that must be used now to reduce pollution.	1.1	1.0	**0.2**
24. Industry, government and the public should decide together what level of pollution should be allowed.	0.6	0.5	**0.1**
3. When jobs are scarce, an increase in employment is good even if there is resulting pollution.	-1.7	-1.7	**0.1**
46. Government and industry skew their risk estimates to suit their own purposes.	0.6	0.6	**0.0**
31. We would all be better off if the legal procedures were easier to follow.	0.6	0.7	**-0.1**

Descending Array of Differences Between Factors (continued)

	Factor A	Factor B	Difference
4. If environmental restrictions limit the ability of a company to make a profit, the restrictions should be relaxed.	-1.5	-1.3	**-0.1**
27. It is really hard to know if decision makers have the same values as I do.	0.4	0.7	**-0.3**
12. It is better to put facilities in communities with high unemployment; the people there need the jobs.	-1.3	-0.9	**-0.4**
25. All information should be shared in easily understood language as soon as it is available.	0.7	1.2	**-0.5**
5. Industry works with communities to maintain a good public image.	-0.7	0.2	**-0.9**
26. Who provides information makes a difference to me; the person must be honest.	1.0	2.1	**-1.0**
10. It doesn't matter how much we pollute today because tomorrow's technology will solve the problem.	-2.3	-1.2	**-1.1**
39. Conflict in decision making is necessary and healthy.	-0.0	1.1	**-1.1**
9. I tolerate risk as a fact of life, but I don't like it.	-0.2	0.9	**-1.2**
41. The chief function of government is to support the economy.	-1.3	-0.1	**-1.2**
14. Government and industry know what they are doing; they are the experts.	-1.7	-0.5	**-1.2**
28. It is impossible to know whether or not a process is really safe without adequate technical education.	0.1	1.5	**-1.4**
40. Consensus is impossible when activists become involved in environmental decisions.	-0.6	1.2	**-1.8**
16. The government adequately enforces environmental laws to protect human health and safety.	-1.5	0.3	**-1.9**

Descending Array of Differences Between Factors (continued)

	Factor A	Factor B	Difference
23. Citizens have ample opportunity to be involved in siting decisions in their community.	-0.9	1.1	**-1.9**
6. Scientific risk assessment should be the major consideration in siting decisions.	-0.3	1.8	**-2.1**
1. Waste facility siting means economic growth and prosperity for the community.	-1.7	0.4	**-2.1**
29. If the public were more familiar with the operation of a waste facility, they would be more willing to consider it.	-0.9	1.2	**-2.1**
17. Industry usually complies with environmental laws even when it costs them money.	-1.4	0.8	**-2.3**

APPENDIX F

CONSENSUS STATEMENTS

Consensus Statements

	z-score
47. Industry must be required to recycle, reduce wastes, and use safer techniques and raw materials.	1.1
45. There are clean technologies available that must be used now to reduce pollution.	1.0
25. All information should be shared in easily understood language as soon as it is available.	1.0
22. Citizens should be involved in every step of a siting decision.	0.9
31. We would all be better off if the legal procedures were easier to follow.	0.6
46. Government and industry skew their risk estimates to suit their own purposes.	0.6
30. Citizens should have their own experts.	0.6
27. It is really hard to know if decision makers have the same values as I do.	0.6
24. Industry, government and the public should decide together what level of pollution should be allowed.	0.5
21. Waste facilities give a community a bad reputation.	0.4
35. The people living in a community know best what is good for them	0.2
20. Allowing a waste facility to locate in a community divides a community.	0.2
42. Just being physically present in situations where environmental decisions are made is not enough.	0.1
15. Cost effectiveness in more important to industry and government than environmental issues.	-0.0
19. The character of a community changes after a waste facility is located there.	-0.1
32. Government shouldn't be trusted in making siting decisions.	-0.2
5. Industry works with communities to maintain a good public image	-0.2

Consensus Statements, Continued

	z-score
33. Government uses citizen opinion against them.	-0.6
11. The world would be a better place to live if we could go back to the good old days.	-1.0
12. It is better to put facilities in communities with high unemployment; the people there need the jobs.	-1.1
4. If environmental restrictions limit the ability of a company to make a profit, the restrictions should be relaxed.	-1.4
3. When jobs are scarce, an increase in employment is good even if there is resulting pollution.	-1.7

APPENDIX G

RESEARCH APPROVAL AND CURRICULUM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
FOR HUMAN SUBJECTS RESEARCH

Date: 04-12-93 IRB#: AS-93-064

Proposal Title: PRAGMATIC APPROACHES TO RESOLVING GRIDLOCK IN THE SITING AND REMEDIATION OF HAZARDOUS AND RADIOACTIVE WASTE FACILITIES

Principal Investigator(s): Mike Hirlinger, Keith Willet, Jim Lawler

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

APPROVAL STATUS SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING.
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL. ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval are as follows:

Signature: Marie L. Tibley Date: April 23, 1993
Chair of Institutional Review Board

VITA

Kenneth Bosma

Candidate for the Degree of

Master of Science

Thesis: EXPLORING NIMBY GRIDLOCK: A CASE STUDY OF THE HAYSTACK HAZARDOUS WASTE FACILITY SITING CONTROVERSY

Major Field: Environmental Science

Biographical:

Personal Data: Born in Bitburg, Germany, on June 19, 1965, the son of Cornelius and Anneliese Bosma. Married to Theresa Laurel Bosma.

Education: Graduated from Shawnee High School, Shawnee, Oklahoma in May 1983; attended Seminole Junior College, Seminole, Oklahoma, June to December 1987; attended Chaffey Junior College, Alta Loma, California, January to August 1988; received Bachelor of Science degree in Business Management from Oklahoma State University, Stillwater, Oklahoma in December 1990. Completed the requirements for the Master of Science degree with a major in Environmental Science at Oklahoma State University in December 1996.

Professional Experience: Served in the United States Army from 1985 to 1987; commissioned as 2nd Lieutenant in Oklahoma Army National Guard in May 1990; employed by Northrop Worldwide Aircraft Services, Incorporated, as an Environmental Coordinator 1993 to present.