Montana's Hazardous Waste Burning Issue: Public Opinion And Expert Opinion

Mary Noel
Carroll College, Helena, MT
MONTANA'S HAZARDOUS WASTE BURNING ISSUE:
PUBLIC OPINION AND EXPERT OPINION

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MARY NOEL

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Director

Reader

Reader

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CHAPTER I
INTRODUCTION:
PUBLIC OPINION, EXPERT OPINION,
AND MONTANA'S HAZARDOUS WASTE BURNING ISSUE

The issue of whether to allow the disposal of hazardous waste by incineration is timely and controversial on a global scale. People are lined up on both sides of the issue, ready to persuade others to accept their position, some using arguments such as the one informing us that dioxins and furans, byproducts of hazardous waste incineration, "become more concentrated as they move up the food chain...causing cancer and birth defects, among other afflictions."1 Literature on the subject of hazardous waste burning contains a myriad of scientific and technical language, information on why it is safe or unsafe, what the consequences will be if burning is permitted, and the consequences if burning is not allowed.

Decision makers must place a great deal of importance on scientific and technical facts when deciding whether to allow the incineration of hazardous waste. Because the decision may have implications for public health and the economic viability of a community, this issue has become highly controversial and at times emotional. Although hazardous waste burning is a global issue, this thesis will focus on incineration of hazardous waste in one particular state, Montana.

In examining public opinion and expert opinion regarding the hazardous waste burning issue in Montana, we will turn to the writings of Daniel Yankelovich. Yankelovich has conducted public opinion polls for over 30 years, serves as chair of two public opinion polling groups, and is president and cofounder of the Public Agenda Foundation, dedicated to improving the quality of public debate. Yankelovich, in his book *Coming to Public Judgment: Making Democracy Work in a Complex World*, introduced the proposal that even citizens who are not experts may have strong feelings about an issue, but their opinions are often discounted as non-technical and irrelevant.² Yankelovich wrote that public opinion is difficult to understand “in all of its shadings and complexity,”³ and that he has not conducted a public opinion survey that didn’t yield surprising results.

If public opinion were as simple and one-dimensional as it is usually represented in newspaper headlines (e.g., ‘51 percent of the public support protective tariffs’), then one would think that after more than thirty years it would be fairly predictable and surprise free. But instead, American public opinion reveals itself as rich and subtle and endowed with a depth of thought and feeling that must win the respect of all who study it seriously.⁴

Yankelovich pointed out that Americans have an opinion on almost every issue, even if they do not know anything about the issue. He lamented, “Surely the reader of public opinion polls must sometimes wonder, ‘Is this really the public’s opinion? How can people be so blind, so foolish, so easily manipulated?’”⁵ But whatever

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³ Ibid., xi.

⁴ Ibid.

⁵ Ibid., 15.
opinion the public holds, Yankelovich argued that the public is losing its ability to take part in political decisions that affect their lives. "The fateful decisions are made in Washington, in corporate boardrooms, on Wall Street, in state legislatures, and in city halls. They are shaped by economic experts, military experts, scientific experts, trade experts, public relations experts, media experts." The public is having less effect on public policy decisions.

Yankelovich explained that most Americans "hold deep and passionate convictions on many issues of public concern." He presented examples such as concern for the growing problem of homeless Americans, and threats to our environment. Yankelovich illustrated a barrier he claimed exists between the public and experts by using the "glass ceiling" concept that keeps many women from reaching top management levels in corporations. "[T]he political reality is that an intangible something separates the general public from the thin layer of elites—officials, experts, and leaders who hold the real power and make the important decisions."

Yankelovich explained that "part of the expert’s expertise is the ability to distinguish personal opinions from knowledge." He said we tend to apply the same standard for public opinion as we do for expert opinion, because of the meaning our culture gives to opinion. "Opinion is generally defined in opposition to knowledge. We fall back on

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6 Ibid., 2.
7 Ibid., 3.
8 Ibid.
9 Ibid., 45-46.
opinion when knowledge is lacking."\textsuperscript{10} We even use opinion to take the place of knowledge. Next, Yankelovich linked knowledge to validation. "One \textbf{knows} that the earth is round rather than flat because this discovery has been scientifically validated: it has been proven through well-accepted empirical methods."\textsuperscript{11} But he asserted that validated knowledge is not necessarily scientific; if he asks someone for the time, the person may have an opinion as to the time of day, but will probably look at her watch anyway. Then she \textbf{knows} what the time is, because she has validated it by her watch, or "methods suitable for the occasion."\textsuperscript{12} And so, according to Yankelovich, in our daily lives the difference between knowledge and opinion is a question of validation which is accomplished by empirical methods, "more or less casual or scientific depending on the occasion."\textsuperscript{13}

Yankelovich explained that with the vast amount of validated knowledge all of us need, we must rely on opinion, based on information.

A large proportion of our national resources are devoted to educating and training specialists on whose opinions we depend because of the excellence of their information and their skill in interpreting it. The opinions of the general public never count as much as those of the experts when it is expert-type opinion that is needed.\textsuperscript{14}

Beyond the question of knowledge and opinion, Yankelovich illustrated that even though experts acting on behalf of the public have

\begin{itemize}
\item \textsuperscript{10} Ibid., 47.
\item \textsuperscript{11} Ibid., 47-48.
\item \textsuperscript{12} Ibid.
\item \textsuperscript{13} Ibid., 48.
\item \textsuperscript{14} Ibid.
\end{itemize}
superior knowledge, the experts often appear to be acting within the same beliefs and values as the public. Yankelovich, however, does not think they are.

Leaders and experts seek to advance their own values and interests. This is why so much emphasis is put on public relations. Correcting the public's understanding is rarely the goal of public relations. The usual goal is to make it possible for special interests to achieve objections and advance values the public does not fully share.15

The experts sometimes use their technical language as what Yankelovich called a "gatekeeping function,"16 that is, "if you do not speak the lingo, you are automatically an outsider, which thereby safeguards the subculture from invasion by outsiders and preserves it for insiders."17 Experts may think they know the level of expertise of their audience, or what Yankelovich called the "public's starting point."18 Yankelovich asserted that on most issues, experts have been thinking about the question for sometimes years, while the public usually learns about the issue when plans are revealed.19

With this preview of the difference between public opinion and expert opinion, this thesis will examine what is meant by hazardous waste and incineration, as well as look at existing policy and views of supporters and opponents. Literature by researchers of public opinion and expert opinion will be reviewed. The analysis will then examine Yankelovich's theory about the gap between public opinion and expert

15 Ibid., 107.
16 Ibid.
17 Ibid.
18 Ibid., 160.
19 Ibid.
opinion in light of the hazardous waste burning issue in Montana.

Yankelovich is concerned because

The key to successful self-governance in our Age of Information is to create a new balance between public and experts. Today that relationship is badly skewed toward experts at the expense of the public...[elevating] the specialized knowledge of the expert to a place of high honor while denigrating the value of the public's potentially most important contribution—a high level of thoughtful and responsible public judgment.20

Yankelovich claimed that experts and the public speak differently about the issues confronting them. To identify language used by experts and the public regarding the hazardous waste burning issue in Montana, the thesis will examine news items from a local newspaper. We will determine if language used by the public significantly differs from language used by those identified as experts. Our focus will be on one company, Ash Grove Cement Company located at Montana City, and its attempt to obtain permits from state and federal agencies to burn hazardous waste for fuel in their cement kiln.21 Chapter II will present the historical perspective of hazardous waste incineration in Montana, along with a look at some of the positions taken by supporters and opponents of the issue.

20 Ibid., 11.

21 Holnam, Inc., a cement plant located near Three Forks, was also pursuing plans to burn hazardous waste but dropped its proposal in 1994, "because there are insufficient quantities of acceptable quality waste available in reasonable proximity to the plant." "Holnam drops waste burning." Helena Independent Record 15 June 1994.
CHAPTER II

HISTORICAL PERSPECTIVE OF MONTANA'S HAZARDOUS WASTE BURNING ISSUE

In order to more effectively conduct a study of how the public and experts in Montana are discussing the issue of hazardous waste burning, Chapter II presents a historical perspective, including definitions of hazardous waste and incineration, and what has taken place in Montana to date regarding the issue. Also in this chapter is a brief look at the positions of supporters and opponents of Ash Grove Cement Company's proposal to burn hazardous waste for fuel in manufacturing cement.

Hazardous Waste and Incineration

The United States Environmental Protection Agency (EPA) has designated specific criteria for wastes to be regulated as "hazardous." Hazardous waste is a subcategory of "solid waste," an all-inclusive term encompassing "any garbage, refuse, sledge, and other discarded material including solid, liquid, semi-solid or contained gaseous material, resulting from industrial, commercial, mining and agricultural operations and from community activities."¹ The waste burned in cement kilns is primarily waste that contains organic compounds, and "most of these wastes are by-products of industrial

manufacturing and chemical production processes or result from the clean-up of contaminated sites."2

Ash Grove Cement Company proposes to replace 20 percent of its fossil fuels (natural gas, coal, solid petroleum, and liquid petroleum) with the alternative fuel product, which Ash Grove describes as "common energy-bearing wastes from aluminum plants, petroleum refineries, and other industries. Many materials are chemically similar to household wastes such as paint and paint thinners, used oils, fingernail polish, inks."3 Ash Grove proposes to incinerate this alternative fuel during the cement manufacturing process. What does the process of incineration involve?

Incineration is defined as "the conversion of waste materials to gaseous products and solid residues by the process of combustion."4 It is the technology used to destroy organic wastes and can break down natural and man-made compounds. A hazardous waste incinerator is "a device in which wastes are burned...at high temperatures...for an adequate time within the combustion chamber, with oxygen, and proper mixing of the waste with oxygen."5 Incineration and land disposal are the most common methods of disposing of wastes in the United States today.6

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5 Ibid.

6 Ibid.
Before the 1950s, smoke from incineration was regarded as a "necessary consequence of progress." For example, "the civilian war effort posters of World War II proudly showed smoke streaming from the stacks as a symbol of America's industrial might." However, as a result of increased awareness of environmental issues and an increased level of education of United States citizens, along with urbanization and advancing technology, incineration systems were subject to regulation. In 1963, the first federal air pollution legislation was passed; the Clean Air Act was passed in 1970 and amended in 1990. The act remains today as the federal law governing pollution and environmental concerns of this country's air.

Rotary kilns, such as the one employed by Ash Grove in the manufacture of cement, are commonly used to incinerate wastes, and can accommodate liquids, gases, or solids in bulk or in containers. The kiln is a cylindrical shell mounted on its side at a slight angle to the horizontal. As the kiln rotates and the wastes travel down the slope, the organic chemicals in the waste convert into gases and partially combust. The gases then pass into another combustion chamber (called an after burner or the secondary combustion chamber) where more complete combustion is achieved. Ash residue is removed from the lower end of the kiln.

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7 Ibid., 13.
8 Ibid.
9 Ibid.
In 1991, Ash Grove Cement Company, located at Montana City near Helena, Montana, announced plans to introduce an alternative fuel product to the fuel mix used to fire the company's kiln. Because federal and state laws require a company to obtain permission to incinerate waste commercially, Ash Grove began the necessary permitting process with Montana's Department of Health and Environmental Sciences and with the United States Environmental Protection Agency in April of 1993. As Ash Grove's plans became known through the media, citizens began to seek ways to legislate the burning of hazardous materials in Montana.

**Legislation**

During the fall of 1992, a special session of the Montana Legislature called to balance the state's budget also passed two bills dealing with the incineration of hazardous waste in cement kilns. One bill created a 13-month moratorium on the importation of hazardous waste into Montana; that bill was vetoed by Montana's Governor Marc Racicot as unconstitutional. The second bill placed a 13-month moratorium on the granting of permits to burn hazardous waste by the Department of Health and Environmental Sciences (DHES). Ash Grove contended that this bill did not affect their plans, as they expected the permitting process to take at least five years.11

Senate Bill 338 was introduced in Montana's regular legislative session in 1993; this bill, along with other restrictions, would prohibit commercial burning of hazardous waste within five miles of schools.

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and residences, and within four miles of rivers, lakes, and other bodies of water.

Senate Bill 338 began its roller-coaster ride through Montana's law-making body by being defeated in the Senate Natural Resources Committee. The Senate as a whole then agreed to debate the siting bill, only to defeat it on a vote the following day. Senators later agreed to again vote on the bill on the day before their mid-term break, and allowed the bill to pass by one vote. SB 338 then moved to the House of Representatives.

The House Natural Resources Committee held a hearing on the siting bill in mid-March of 1993, and later in executive session left the bill in limbo with a vote of 8-8. Several attempts to bring the bill from the Natural Resources Committee for a vote before the House failed, as did attempts to amend the bill and present it to voters in the form of a referendum.

A siting bill introduced in Montana's 1995 legislature was also killed. So, Montana still has no state siting regulations for hazardous waste burning facilities as of April 1995. County government, however, is interested in zoning for hazardous waste burning.

**County Zoning**

During the summer of 1994, the Jefferson County Planning Board proposed a zoning ordinance that would restrict hazardous waste burning to a distance greater than two miles from a school. Ash Grove Cement Company, located in the northern part of Jefferson County, is situated about one-half mile from the Montana City Elementary School; the school serves 300 children. The planning board held hearings on the zoning ordinance, received comments
from county residents, and submitted its proposal to the Jefferson County Commissioners. The commissioners may vote to formally adopt the zoning plan when they meet in April of 1995. The zoning plan would prohibit Ash Grove Cement Company from burning hazardous waste as fuel in their kiln.

Residents of northern Jefferson County and others have taken positions on the hazardous waste burning issue at Ash Grove Cement Company. What are the positions taken by those opposed to the burning and those in favor?

### Opposition and Support of Hazardous Waste Burning in Montana

**Opposition**

One of the leading groups opposed to burning hazardous waste in Montana's cement kilns is a group called Montanans Against Toxic Burning (MATB). Since early in 1993, this group has advocated a hazardous waste facility siting act. Such an act would establish siting criteria for commercial waste burning facilities. The facility siting act recommended by MATB includes prohibiting the location of a facility:

- within five miles of existing buildings;
- within four miles of surface water;
- within a 100 year floodplain;
- on farmlands classified as “prime” or “unique;”
- within an area where the facility would not comply with local zoning regulations.12

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12 Dangerous Waste Incinerator Siting Act, Update on Senate Bill #338 (Montanans Against Toxic Burning, Fact Sheet, February 1, 1993).
MATB is concerned that Montana currently has no legislation to control commercial facilities wishing to burn hazardous waste. According to MATB,

The siting law is necessary to protect public health and safety. It will provide a needed framework within which responsible companies can become permitted and operate safely. This legislation will protect the economic well-being of the state and the long-term interests of the people of Montana.13

Other major concerns by those opposed to hazardous waste burning in cement kilns have been voiced. Rachael Raue Sirs, a petroleum engineer residing in northern Jefferson County, the location of Ash Grove Cement Company's Montana City plant, argued that property values are affected, agriculture and recreation are threatened by toxic metals and dioxins which accumulate in soil and water, and tourism is threatened as a result of the loss of the “clean reputation” of Montana. The engineer also stated that “a hazardous waste incineration facility threatens the economic base of the community in which it proposes to locate,” by forcing real estate prices down and by the loss of income from tourism.14

Some Montanans feel Montana is a target of industries wishing to get rid of their hazardous waste, because Montana has “relatively weak laws regulating hazardous waste disposal.”15 Allen Lefohn, a Helena research scientist believes, as a result of “numerous discussions with scientists and engineering professionals,” that the risk to human health and the ecosystem from the emission of

13 Ibid.


"numerous unknown organic chemicals" is too great, and that there is no reason to locate a hazardous waste burning facility near schools and delicate ecosystems.\textsuperscript{16}

As a candidate for the Montana legislature in 1994, Jim Madison supported siting legislation to regulate the location of hazardous waste burning facilities in Montana. He wrote in a column in the local newspaper that 41 states have enacted some sort of siting legislation for hazardous waste burning facilities in the interest of public health. As examples, he cited Utah, which forbids facilities to be located less than five miles from schools and residences; Oregon, which has a buffer of one mile; and Idaho, which requires facilities to be located not less than 5000 feet from schools and residences. Madison's strongest argument in support of siting legislation is "because the people of the district [House District 39] have strongly and clearly supported such legislation."\textsuperscript{17}

Concerned with the "unforeseen effect hazardous waste burning could have on the long-term health of school children," the Montana Parent Teacher Student Association passed a resolution calling for state and federal legislation banning hazardous waste burning facilities in Montana.\textsuperscript{18}

A representative of the group Montanans for a Healthy Future, Paul Johnson, asserted that the solid waste Ash Grove wishes to burn


\textsuperscript{17} Jim Madison, "Toxic-burn siting rules are necessary," \textit{Helena Independent Record}, 30 October 1994.

near the Montana City school “consists of over 490 EPA classified hazardous and toxic wastes, including a number of known carcinogens.” He goes on to say, “Ash Grove’s proposal would pose significant adverse health risks to persons living within a six-mile radius of the smokestack, particularly the school children of Montana City.”

Other groups united to support facility siting legislation in Montana during the 1993 legislature were: The Last of the Best Coalition, Citizens for the Health of Our Children, the Montana Environmental Information Center, and the Northern Plains Resource Council.

Support

By far the largest and most vocal supporter of hazardous waste burning in cement kilns in Montana has been Ash Grove Cement. During Montana’s 1993 Legislative Session, Ash Grove spent $85,746 on lobbying efforts, the second highest amount spent on lobbying during that session. The company has also distributed colorful brochures and produced a video presenting its story. Ash Grove has provided the following reasons why it should be permitted to burn hazardous waste: environmental benefits (waste would not go to landfills), recycling, jobs, and the economy. The following statement was made by Ash Grove’s public relations consultant:

If it meant the difference between having to close your doors forever, or being able to continue operating your business, you

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would pursue the option of using waste-fuels even if you expected the idea might create some temporary misunderstandings and controversy. Especially if you were already successfully using this same alternative form of energy-from-waste at facilities in other states.21

There are others as well who supported hazardous waste burning in Montana. Peggy Trenk, the executive director of the Western Area Trade Association (WETA), wrote of the understanding “that Montana desperately needs to develop affordable options for managing the regulated wastes we generate. We believe an existing Montana facility...ought to be allowed to prove its case.”22

Some citizens living in the Montana City area are supportive as well. Al Hill, who resides near Montana City, explained, “All of our kids went to Montana City school...If there was a health hazard, no way would I stand behind this industry...Ash Grove has been great for the community and feels very strong for the children’s health and education.”23 Brian Peacock, a former member of the Jefferson County Planning Board, suggested that if Ash Grove’s proposal is approved by state and federal officials, the company should be allowed to prove itself.24 Craig Byington, a geologist, wrote:

With one of my children going to the Montana City school, safety in that area is my utmost concern so I invested much time in understanding this issue from a scientific basis...I

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convinced myself that the burning proposed by Ash Grove is both safe and environmentally responsible.\textsuperscript{25}

Many employees of Ash Grove also support the company's proposal. Several wrote letters to the \textit{Helena Independent Record} asking the community for a chance to demonstrate if Ash Grove can safely burn waste fuel. Pat Songer at least wants Ash Grove to be able to go through the permitting process, to prove the burning can be safe. "We the taxpayers pay the Health Department and EPA to protect our environment and health. Let's allow them to do their job."\textsuperscript{26} And Roy Anders wrote: "Ash Grove does not say, 'Trust us, it's safe.' Ash Grove does say, 'Let us prove that it is safe,' under the strictest permitting laws in the nation, Montana's."\textsuperscript{27}

\textbf{Summary}

Thus far, we have examined definitions of hazardous waste and incineration, and discussed steps taken by Montana's legislature and local governments; we presented positions of those supportive of and opposed to hazardous waste burning in Montana, and at Ash Grove Cement Company in particular. Those who want no hazardous waste burned in Montana (or at least want hazardous waste burning facilities sited) feel such burning is a threat to public health and safety, agriculture and recreation, and property values. Some fear Montana will become a dumping ground for waste from other states. Those in favor of allowing Ash Grove to burn hazardous waste tout


\textsuperscript{26} Patrick Songer, "Waste burning is safe," \textit{Helena Independent Record}. 23 March 1993.

environmental benefits, more jobs for Montana, and a boost to Montana's economy.

Because this thesis investigates Daniel Yankelovich's discussion of public opinion and expert opinion as it relates to hazardous waste burning in Montana, Chapter III examines what researchers have found regarding public opinion and expert opinion.
CHAPTER III

LITERATURE REVIEW:
PUBLIC OPINION AND EXPERT OPINION

The present controversy in Montana over whether to allow incineration of hazardous waste in an existing cement kiln is receiving notice both from experts, or those who speak in technical language and are trained in technical areas, and from citizens, or the public, who may not have the scientific training of the experts, but feel just as strongly about the issue. What are researchers saying about the roles of public opinion and expert opinion regarding hazardous waste burning in particular, and issues of risk in general?

Daniel Yankelovich claimed that a barrier separates the public from "elites" making policy decisions today — "officials, experts, and leaders who hold the real power."\(^1\) He explained that elites "think they know better than the public because they are well educated and articulate."\(^2\) Yankelovich explains:

In recent years my work has made me conscious of the enormity of the gap that separates the public from the experts. As an interpreter of public opinion, I serve as a go-between for the two worlds of public opinion and expert policy making. Each year the distance between the two worlds grows greater. It is sometimes difficult to believe that the public and policy-

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\(^2\) Ibid., 53.
making experts in the United States share the same language and culture.³

An "adversarial struggle" between the public and experts exists today, argued Yankelovich, to determine who will govern America. Experts believe the general public is "ill informed and ill equipped to deal with the problems to which they, the experts, have devoted their lives." While experts do not set out to mislead the public, they often use technical jargon that may exclude the public. They sometimes unwittingly impose their personal values on the country because they do not separate their values from their expertise.⁴

The public, on the other hand, has high respect for its opinion. "The public holds itself and its powers and privileges in great esteem."⁵ The public wants to be heard, but often is encroached on by the experts and "technocrats." Yankelovich illustrated:

...most average citizens are ill-prepared to exercise their responsibilities for self-governance, even though they have a deep-seated desire to have more of a say in decisions. People want their opinions heeded — not every whim and impulse that may be registered in an opinion poll, but their thoughtful, considered judgments.⁶

Yankelovich explained that usually public opinion cannot be scientifically validated because, unlike expert opinion, it is not based on empirical evidence. Public opinion is usually in the form of a value judgment. Public opinion focuses on values rather than avoiding values, as experts often do.⁷

³ Ibid.
⁴ Ibid., 4.
⁵ Ibid., 53.
⁶ Ibid. 4.
⁷ Ibid., 54.
In exploring public opinion and expert opinion, Yankelovich pointed out there can be no winner if one side or the other takes over. If the experts overreach themselves and further usurp the public's legitimate role, we will have the formal trappings of democracy without the substance, and everyone will suffer...the electorate will express itself in populist fury and launch another episode of native know-nothingness...the backlash is likely to prove worse than the disease...[However] if the public dominates and pushes the experts out of the picture altogether, we will have demagoguery or disaster or both. A better balance of power and influence is needed, with each side performing its function in sympathy and support of the other.8

Perhaps one of the most glaring examples of Yankelovich's theory is present in a publication of the Environmental Protection Agency (EPA). In a section on public involvement in permitting processes for hazardous waste burning, the public is assured their concerns are considered before a facility is granted a permit.

Members of the public may submit written comments (including questions) to the agency during the public comment period...The draft permit may be changed or revised because of new technical information or to address concerns about the technical operations of the facility...Permitting agencies, however, do not have authority to reject permit applications on non-technical grounds (underlining mine).9

Are there others who agree with Daniel Yankelovich? Indeed, Yankelovich is not alone in his beliefs concerning expert opinion and public opinion. Other authors pointed out that there is a difference between those who rely on the facts and those who purport to explain their position in unscientific terms.

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8 Ibid., 4-5.

“Elite expertise” and “citizen control” is how McAvoy identified the tension between experts and the public. He explained that often public policy makers think they know better than citizens how to resolve the issues, and that “this tension between the need for expertise and citizen control in the making of public policy poses once more the question of what the ‘sovereignty of the people’ means.”

McAvoy went on to say that when citizens attempt to control the bureaucracy, they challenge the “dominant elite-based models of policy making in which democratic institutions are muted or circumvented.”

Rowan used the terms “technicals” and “democratics” to identify experts and the public. Technicals, according to Rowan, “tend to privilege scientific and technical information in discussions about its management and view communication as a hierarchical, one-way communication process where they as experts inform the decision making of less-expert publics.” Democrats, according to Rowan, “are concerned more with matters of justice and fairness than they are with information about the precise nature and severity of the hazard.” Therefore, perhaps if democratics believe a corporation


11 Ibid.

12 Ibid.


14 Ibid.

15 Ibid.
such as Ash Grove Cement Company has displayed little concern for the safety of people in the community, the democratics will pay little attention to discussions about the perceived lack of risk of the hazard.\textsuperscript{16}

The strength of the technical response, according to Rowan, is the emphasis on the importance of accurate information, but it is "ultimately elitist" and narrowly concentrates on "one kind of expertise, technical expertise, and one kind of information, that about risk severity and likelihood."\textsuperscript{17}

Democrats' strengths lie with emphasis on "listening and open dialogue," assuming that "\textbf{all} parties affected by a risk have some expertise to bring to a discussion of its management(underlining mine)."\textsuperscript{18} The democratic model does have weaknesses also, in the assumption that "a fair process equals a fair product."\textsuperscript{19} Another weakness, according to Rowan, is that the democratic model may try to

\ldots outlaw an important communication skill: persuasion...There is nothing inherently wrong with attempts to gain agreement. The problem with persuasion is that it often occurs \textit{prematurely}, when people should be listening or gathering information rather than attempting to persuade.\textsuperscript{20}

\begin{footnotesize}
\begin{itemize}
\item\textsuperscript{16} Ibid.
\item\textsuperscript{17} Ibid., 303.
\item\textsuperscript{18} Ibid.
\item\textsuperscript{19} Ibid.
\item\textsuperscript{20} Ibid.
\end{itemize}
\end{footnotesize}
Juanillo and Scherer refer to public opinion and expert opinion as "classical" and "dialectical."\textsuperscript{21} Their description of dialectical is

...a democratic exchange of information, opinions, and issues concerning the assessment of risk and its acceptability among different stakeholders (that is, experts, policy makers, interest groups, and the general public). Reflecting a more Jeffersonian approach, this paradigm recognizes the complex scientific as well as sociopolitical values that the different actors bring into the process...[and] can potentially foster critical thinking and provide stakeholders a better chance of attaining informed judgments or decisions.\textsuperscript{22}

The classical model is

...a process whereby government regulators, scientists, experts, policy makers, industry, and others steer the public toward accepting technical-scientific judgments of risk acceptability as well as decisions on risk management. Inherent...are the following assumptions: ...Scientists or experts are the only legitimate providers of 'accurate'...information on risk; ...technical rationality is superior to lay rationality; and...the public is a passive receiver of scientific risk information.\textsuperscript{23}

Juanillo and Scherer's classical model is "designed to convey to the public the rational-technical knowledge grounded in risk assessment and risk management technologies," and "translates as advocacy for determining which risks are acceptable."\textsuperscript{24}

Citing the dialectical model as a free flow of information, Juanillo and Scherer pointed out that it provides opportunity for everyone affected to look at proposals in context, assuming that stakeholders have adequate information to help them participate effectively. A


\textsuperscript{22} Ibid.

\textsuperscript{23} Ibid., 294-95.

\textsuperscript{24} Ibid., 278.
danger, however, is that poorly informed stakeholders who do not understand the scientific process "can cripple effective and sound decision making." Juanillo and Scherer used the success of the anti-Alar campaign as example of "the public's unfamiliarity with science in general and with toxicology in particular." The dialectical model must move the focus of decision from "uninformed, emotion-based opinion" to an "arena of reasonable and responsible debate." Juanillo and Scherer believed individuals view risks in the way they will be personally affected, while experts look at the overall impact on society.

Heath and Nathan referred to the public as the "human experience" and to experts as "the scientists' rational ideal." Heath and Nathan explained that the rational ideal is successful only when scientists have succeeded in informing the human experience of the necessary technical knowledge for policy making. They went on to say that the decision about what level of risk is acceptable is "not a technical question but a value question...technical people cannot have it both ways. Either their expertise is worth something in regard to making wise calculations of risk, or the concept of zero risk must be the only acceptable standard."

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25 Ibid., 295-96.
26 Ibid.
27 Ibid.
28 Ibid., 296.
30 Ibid.
Heath and Nathan cited the National Research Council (1989) as they concluded, "To remain democratic, a society must find ways to put specialized knowledge into the service of public choice and keep it from becoming the basis of power for an elite."\textsuperscript{31}

A balance of technical and value considerations is difficult to reach in the real world, according to Plough and Krimsky in their writings on "technical rationality" and "cultural rationality."\textsuperscript{32} They wrote that conflicts naturally arise between the "rational qualitative approach" to risk, and public perceptions.

While some experts and regulators lamented the rise of "irrational" discourse in environmental debates (the dreaded "not-in-my-backyard" response to siting issues), this same discourse was an expression of their own democratic ideals, which included the opportunity to oppose official decisions that ignored the experiential context of risk.\textsuperscript{33}

Plough and Krimsky's conclusion advised that both experts and laypersons, or both technical and cultural rationality, must be "capable of responding to a process of mutual learning and adjustment. If the technosphere begins to appreciate and respect the logic of local culture toward risk events and if local culture has access to a demystified science, points of intersection will be possible."\textsuperscript{34}

Kauffman, an international environmental policy scholar, described the challenge of institutions to be the education of the public in order to "overcome public fears and uncertainty about

\textsuperscript{31} Ibid., 21.


\textsuperscript{33} Ibid.

\textsuperscript{34} Ibid., 9.
certain complex technologies."35 She was concerned that the public may tend to trust institutions and individuals that do not have the best information on an issue, "rather than those who are most likely to be heard, that is a representative of government or an institution."36 For example, Kauffman explained that, "In a community, an individual clergyman, doctor, nurse, or lawyer is more likely to be heard than is a representative of government."37

Writing of "two worlds of risk assessment," Kasperon used the terms "macro" and "micro" to describe expert and public input into policy making. He emphasized that trust is paramount in the way the micro element views the macro element. If experts aren't forthright in the information they present, they will be seen as not being competent; people want to believe experts are knowledgeable. But Kasperon is concerned that when the public hears experts disagree, "They will think, 'Why are you taking such a clear position when the evidence is so disputed?' In short, the more that you try to be forthright and provide all the data, the more you may risk appearing uncaring or arrogant."38

Also writing about the expert and public information gap, Mitchell explained that when the public does not accept what the experts are saying, the experts regard the public as irrational. He illustrated that it is most important for the experts and policy makers


36 Ibid.

37 Ibid.

to understand why the public holds the position it does. He sites the importance of giving everyone a chance to speak on his or her position.\footnote{Robert C. Mitchell, Nuclear and Other Energy Sources, Risk Communication (Washington, DC, The Conservation Foundation, 1987), 79-80.}

Often a contributing factor to the gap between experts and laypeople is the fact that the two groups sometimes define risk in different ways.

Experts typically define risk strictly in terms of expected annual mortalities. Laypeople almost always include other factors in their definition of risk, such as catastrophic potential, equity (that is, whether those receiving benefits from a particular technology or action bear their share of the risks), effects on future generations, controllability, and involuntariness. As a result of these differing definitions, laypeople tend to assign relatively little weight to risk assessments conducted by technical experts and government agencies.\footnote{Vincent T. Covello, Detlog von Winterfeldt, and Paul Slovic, Communicating Scientific Information about Health and Environmental Risks: Problems and Opportunities from a Social and Behavioral Perspective, Risk Communication (Washington, DC, The Conservation Foundation, 1987), 115.}

Covello, von Winterfeldt, and Slovic clarified, though, that sometimes laypeople holding firm beliefs are reluctant to change those beliefs, even when presented with scientific evidence opposing their views. They compared laypeople in potential risk situations with motorcyclists, who "often deny that they engage in a high-risk activity even when presented with statistics on the high incidence of motorcycle accidents...some motorcyclists may refer to their superior abilities and experience in handling motorcycles or their accident-free records."\footnote{Ibid.}
Sandman also presented evidence of expert and public differences about the definitions of hazard.

To the experts, risk means expected annual mortality. But to the public (and even the experts when they go home at night), risk means much more than that. Let's redefine terms. Call the death rate (what the experts mean by risk) "hazard." Call all the other factors, collectively, "outrage." Risk, then is the sum of hazard and outrage. The public pays too little attention to hazard; the experts pay absolutely no attention to outrage.42

Finally, Hadden offered concern that citizens are involved in public policy issues only because of self-interest. Hadden concludes with a caution:

A very different kind of criticism of participation focuses not on citizens' capabilities but on their apathy and selfishness. Not a few observers believe that the United States is experiencing a decline of the ideal of the common good. Naked self-interest, it is argued, determines individuals' positions on public issues...individuals participate only when they have a particular stake in the outcome...policies involving such public goods as the environment are especially troublesome because no single individual benefits enough to offset the costs of ensuring that the socially beneficial course is taken.43

Summary

A review of the literature on the role of public opinion and expert opinion in matters of risk illustrated that other researchers agree with Yankelovich that a gap exists between these two types of opinion. So, the gap may affect the present controversy in Montana over whether to allow hazardous waste burning in Ash Grove Cement Company's existing cement kiln, whether to enact siting legislation to control where hazardous waste may be burned in Montana, or whether to ban hazardous waste burning in Montana altogether. Is the gap

43 Ibid., 209.
between public and experts reflected in the language used by each group?

The discussion thus far in the thesis leads to the following research hypothesis:

$$H_1:$$ Experts use technical and scientific language to express their views on the hazardous waste burning issue, while the public uses language that tends to be nontechnical and nonscientific.

The next chapter of this thesis analyzes data relating to Ash Grove's proposal, to determine if language used by experts and the public differs significantly.
CHAPTER IV

METHODS: PUBLIC OPINION, EXPERT OPINION, AND THE LOCAL NEWSPAPER

Daniel Yankelovich introduced a theory that public opinion differs from expert opinion. He stated, "It is sometimes difficult to believe that the public and policy-making experts in the United States share the same language and culture."1 Experts believe the general public is not informed enough to deal with the problems to which experts have devoted their lives.2 We will apply Yankelovich's theory to statements made by the public and experts with regard to the hazardous waste burning issue in Montana. The hypothesis investigates whether experts, when talking about the hazardous waste burning issue, will use words and phrases that are technical or scientific, while the public will tend to use nontechnical and nonscientific language.

Data

The data for this study came from a survey of articles addressing the hazardous waste burning issue in Montana. The articles were taken from the Helena Independent Record from the period January 1, 1993, through February 28, 1995, a total of 26 months. Ninety-nine

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2 Ibid.
items pertaining to the hazardous waste burning issue were found. Eight news articles were discarded because they either did not identify the speaker by name (i.e., to determine status as expert or public) or did not contain statements by persons other than the reporter. Therefore, 91 articles were analyzed for content.

Newspaper articles from the Helena Independent Record were chosen for content analysis because it is the only newspaper in the community in which Ash Grove Cement Company (Montana City plant) operates. Newspaper content was chosen because all news items have the same audience, and newspaper content is accessible to study. News items consisted of news stories, editorials, letters to the editor, "Your Turn" guest editorial columns, and two paid advertisements. Both the public and experts were represented in the news items.

Independent Variables

The independent variables in this study are experts (presenting expert opinion) and the public (presenting public opinion). Keeping with guidelines from Yankelovich\(^3\), experts are those defining themselves as persons with specialized knowledge and skills, or defined as such by the writer of the item: for example, Paul Connett, identified in a news article as a chemistry professor, and Allen LeFohn, who identified himself as a research scientist "recognized for research on human health and the environment,"\(^4\) were categorized as experts. Those individuals commenting on the hazardous waste burning issue not described as experts were classified as public.

\(^3\) Ibid., 9.

Dependent Variables

The Environmental Protection Agency has identified words and phrases most commonly used to describe "elements of incineration of hazardous waste in cement kilns." For purposes of this study, the EPA words and phrases have been labeled "key words." The key words were then divided into five categories according to their similarity. The categories were created for coding purposes.

Dependent variables are key words in five categories.

Category A: "Carcinogens," "mutagenics," "contaminants"
Category B: "Scientific," "technological," "analysis"
Category C: Specific toxic materials and chemicals, for example, "lead," "mercury," "furans," "dioxins"
Category D: "Statistics," "calculations," "percentages," "facts," "findings"
Category E: "Products of incomplete combustion (PICs)," "incineration emissions," "compliance tests"

Category F: No key words. All comments by publics and experts containing no key words were placed in this category.

These key words were identified as those potentially used by experts. It is assumed that members of the public will not commonly use these key words.

The analysis included these steps:

· First, statements attributed to a person were identified. Statements were direct or indirect quotes. Statements by persons or groups not identified were not used.

Second, every person identified in each newspaper item was classified as either a public or an expert.

Third, statements were analyzed for use of key words and placed in a category, one through five, or were placed in the "no key words" category.

Statements were analyzed only for status of the writer or speaker—public or expert—and presence or absence of a key word. Items were not analyzed with regard to support for or opposition to hazardous waste burning.

A contingency table containing the categories was created, and cross tabulation of the results produced the table in Chapter V. Chi-square tests of significant difference were applied to determine if the public and experts differ from what we expected with regard to their use of key words pertaining to hazardous waste burning (i.e., experts will use key words, public will not). Chapter V presents the study's findings.
CHAPTER V
DATA ANALYSIS AND RESULTS

Data from the survey of newspaper articles addressing the hazardous waste burning issue yielded the following results. In Category A, seven statements were made by the public and 12 by experts. In Category B, 24 statements were made by the public and 15 by experts. Category C contained 11 statements by the public and 12 by experts. Category D contained 21 statements by the public and 22 by experts, while six statements by the public and 17 statements by experts were made in Category E. Category F, the "No Key Words" category, contained 39 statements by the public and four by experts.

A total of 82 statements were made by experts; 78 of these statements, or 95%, contained key words. Only five percent of statements made by experts contained no key words. Of the 108 statements made by the public, 69 statements or 64%, contained key words, while 36 percent, or 39 statements, contained no key words. The test of significant difference indicates a Chi-square value of .20 for expert opinion and 44.08 for public opinion. This means that the differences between our expected and observed frequencies were significant for public opinion, but not for expert opinion. The table on the following page presents the results of our analysis of news items.
### TABLE: RESULTS OF CONTENT ANALYSIS

<table>
<thead>
<tr>
<th>Key Words</th>
<th>Public Opinion</th>
<th>Expert Opinion</th>
<th>Item Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category A</td>
<td>7</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>Carcinogens, mutagenics, contaminants</td>
<td>6.5%</td>
<td>14.6%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Category B</td>
<td>24</td>
<td>15</td>
<td>39</td>
</tr>
<tr>
<td>Scientific, technological, analysis</td>
<td>22.2%</td>
<td>18.3%</td>
<td>20.5%</td>
</tr>
<tr>
<td>Category C</td>
<td>11</td>
<td>12</td>
<td>23</td>
</tr>
<tr>
<td>Specific toxic materials and chemicals</td>
<td>10.2%</td>
<td>14.6%</td>
<td>12.1%</td>
</tr>
<tr>
<td>e.g. lead, mercury, furans, dioxins, etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category D</td>
<td>21</td>
<td>22</td>
<td>43</td>
</tr>
<tr>
<td>Statistics, calculations, percentages, facts, findings</td>
<td>19.4%</td>
<td>26.8%</td>
<td>22.6%</td>
</tr>
<tr>
<td>Category E</td>
<td>6</td>
<td>17</td>
<td>23</td>
</tr>
<tr>
<td>Products of incomplete combustion (PICs), incineration, emissions, compliance tests</td>
<td>5.6%</td>
<td>20.7%</td>
<td>12.1%</td>
</tr>
<tr>
<td><strong>Total key words</strong></td>
<td>69*</td>
<td>78**</td>
<td>147</td>
</tr>
<tr>
<td></td>
<td>63.9%</td>
<td>95.1%</td>
<td>77.4%</td>
</tr>
<tr>
<td>Category F</td>
<td>39</td>
<td>4</td>
<td>43</td>
</tr>
<tr>
<td><strong>No key words</strong></td>
<td>36.1%</td>
<td>4.9%</td>
<td>22.6%</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>108</td>
<td>82</td>
<td>190</td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

* $X^2 = 44.08$ p<.05

**$X^2 = .20$ p<.05
The table of results of the content analysis illustrates how many news items were assigned to Categories A through E, the categories containing key words, and how many items were placed in Category F, signifying no key words were found. Each column, Public Opinion and Expert Opinion, lists the number of news items found in each category; the items are percentaged on the columns. Chi-square tests of significant difference were run on the totals of Categories A through E to determine how significant was the difference between the expected and observed key word usage by the public and by experts.
CHAPTER VI

INTERPRETATION OF RESULTS:
SIGNIFICANCE AND MEANING

To examine language used by experts and the public in the discussion of hazardous waste burning, we believed that experts, in giving statements about the hazardous waste burning issue, would use words and phrases identified in our categories of key words, and that the public would commonly tend not to use the words and phrases of the key words.

Importance and Utility of Results

Yankelovich explained that experts tend to use jargon and technical terms when communicating about an issue.1 As we expected, most of the experts' statements, or 95.1 percent, contained key words. The Chi-square value of .20 shows that the difference between our observed and expected frequencies for the experts was not significant at the .05 level.

However, we did not expect the results received from the data for the public. Fully 63.9 percent of statements by the public contained key words, more than statements by the public containing no key words.

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A few samples of statements containing key words follow.

Public Opinion Key Word Data Samples

• "Simply the perception of tainted milk could create problems for the industry, said Mike Cok of Dairygold Farms in Bozeman. Consumers who have a choice will buy pure milk rather than milk with 'a little bit of dioxin,' he said."²

• Patty Penrose-Thompson of Clancy wrote, "A recent EPA study revealed unexpectedly dangerous levels of dioxins and furans in waste cement dust of hazardous waste-burning cement kilns, including the Ash Grove Cement kiln in Chanute, Kansas."³

• Patrick Songer of East Helena wrote in a letter to the editor, "Cement kiln emissions are safe with burning waste-derived fuels. Compliance tests have been done by an independent test lab at all three Ash Grove plants burning hazardous waste. Total allowance emissions were well under health standards."⁴

• Jim Madison of northern Jefferson County wrote in a "Your Turn" editorial column, "Ash Grove is proposing to burn nearly 500 toxic and hazardous wastes in Montana City. Some of these are extremely toxic materials, such as cyanide, phosgene (a chemical warfare agent), arsenic, lead, insecticides and herbicides, and carcinogens like chromium and mercury."⁵


³ Patty Penrose-Thompson, "SB338 is a good bill," Helena Independent Record. 30 March, 1993.


Expert Opinion Key Word Data Samples

- Bill Schoenborn of the EPA said, "The agency found enough dioxin in the dust at hazardous waste-burning sites to study the issue further at six cement plants."⁶

- "Many of the 496 hazardous wastes Ash Grove proposes to burn are classified as toxic, carcinogenic, mutagenic, and extremely hazardous. Yet they characterize them as 'very similar to those we generate in our households.'"⁷

- "If we are really concerned about limiting exposure to unidentified PICs, we should ban all automobiles immediately. Cars are a far greater source of exposure to air toxics, both identified and unidentified, than any cement kiln."⁸

Only 36.1 percent of the public's statements contained no key words. The Chi-square value of 44.08 indicates that the differences between our observed and expected frequencies were indeed significant at the .05 level. What do these results mean in light of our investigation into public and expert statements on the hazardous waste burning issue?

Persons identified as experts on the question of hazardous waste burning in Montana attempted to explain their positions using words they would probably normally use in their fields to communicate information to their audiences. However, the possibility exists that experts are using their technical language as what Yankelovich called a

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⁶ "Lobbyist 'misleads',' Helena Independent Record. 25 March 1993.


"gatekeeping function,"⁹ that is, "if you do not speak the lingo, you are automatically an outsider, which thereby safeguards the subculture from invasion by outsiders and preserves it for insiders."¹⁰ Experts may assume they know the level of expertise of their audience, or what Yankelovich called the "public's starting point."¹¹ Yankelovich asserted that on most issues, experts have been thinking about the question for sometimes years, while the public usually learns about the issue when plans are made public,¹² for example when Ash Grove Cement Company announced plans to apply for permits to burn hazardous waste for fuel.

As for language used by the public, we can only speculate about why there was such a prevalence to use the same key words used by experts. Perhaps, contrary to Yankelovich, the public does in fact have a similar point of departure on the subject as the experts. If this is the case, the public in Montana seem to be well-informed and knowledgeable (relative to experts) about hazardous waste burning. Perhaps a public with higher levels of education is more prevalent in the Helena area compared with the average for the United States. The possibility also exists that the public uses the language of experts because the public perceives that technical language makes them sound like they know what they are talking about (i.e., Yankelovich's "gatekeeping" function). Do those using technical language understand what they are saying? Perhaps the public believes if they talk only

⁹ Yankelovich, 162.
¹⁰ Ibid.
¹¹ Ibid., 160.
¹² Ibid.
about their fears or hopes, they will not be perceived as credible by either experts or other citizens, and particularly not by those making laws and policies which will affect their lives. One problem, however, is that there were no cases found where items quoting a member of the public, either directly or indirectly, gave the reader any indication of the source of the information being presented. It is also possible that experts not identifying themselves as such wrote letters to the Helena Independent Record or were quoted by reporters; not knowing otherwise, we would have classified them with the public.

Problems and Limitations

This study on public opinion and expert opinion regarding hazardous waste burning in Montana used items from one daily newspaper. Even though every item for a 26 month period was analyzed during the study, the sample may not be representative of the opinions of the people of Montana or the people of the Montana City area where Ash Grove Cement Company is located. Also, perhaps there is a more reliable way to identify experts than using self- or other-identification of a person as an expert.

Another problem is that the process of categorization consisted of several judgments by the author; in addition, reliability of the study would be enhanced by employing coders other than the author to code the data.

Most people taking time to write editorials and letters to the Helena Independent Record probably considered themselves to be well-versed and knowledgeable in some capacity on the subject. Thousands of other Montanans may have opinions on hazardous waste
burning but practicality limits opinions and news items printed in the Helena Independent Record.

The hazardous waste burning question prompted many events in the Helena area, including public forums, legislative hearings, and public rallies. People quoted in news articles were not selected by reporters on any random basis, but may have been selected because of their expertise, visibility, or coherence, or because they happened to be speaking during the time the reporter was present. Also, there may be many more terms someone else might consider necessary to be used as key words. Finally, this study does not claim that the presence or absence of a key word in a person's statement determines whether that person is public or expert.

Future Research

The research presented in this thesis just briefly touches on the question of public opinion and expert opinion. Yankelovich's book, from which the basic theory of this paper is taken, goes much further into the question of public opinion and expert opinion in exploring how public opinion is formed and to what extent the public is viewed as credible by experts and policy makers. In order to more fully understand how the public in Montana came to hold their views on hazardous waste burning and what factors influenced their opinions, some in-depth research dealing with behavioral cause and effect may be examined. Although content analysis of news articles is a convenient way to examine public and expert opinion, a more comprehensive method of surveying may be questionnaires, polls, or interviews.
Yankelovich and other researchers argued that a gap exists between the public and experts when discussing matters of risk. This thesis found that the language of the public and experts is actually quite similar when they are presenting their views on the hazardous waste burning issue in Montana. Perhaps there is a third group in addition to the public and the experts, a group of people who are concerned, informed, and familiar with the language of hazardous waste burning, allowing them to engage in meaningful dialogue with experts. This thesis may serve as a valuable starting point for future research to determine if a third group exists.
REFERENCES


Penrose-Thompson, Patty. “SB 338 is a good bill.” Helena Independent Record. 30 March 1993.


