

## SITING THE NATION'S FIRST HIGH-LEVEL NUCLEAR WASTE REPOSITORY:

### SOCIAL IMPACTS FOR UTAH

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#### ABSTRACT

The siting of a high-level nuclear waste repository in the United States has been an issue of great controversy, particularly for the states under consideration. In addition to concerns expressed about the geological stability of the proposed sites, numerous social issues have been raised by the general public--most of which have been addressed by the draft environmental impact statements. Among the social impacts raised by the Department of Energy and the general public, those receiving the greatest attention were the potential influence of the repository on local economics, tourism, and the health status of the local residents.

In an effort to study some of these issues, in November of 1984 the Survey Research Center at the University of Utah conducted a survey of approximately 1,000 randomly chosen residents of the state of Utah. Ten questions on issues of nuclear waste disposal were included, the topics of which included knowledge of nuclear waste disposal issues, visitation patterns to Canyonlands, Arches, and Capital Reef national parks, and public opinion about the possible effects of the repository on jobs, tourism, and the health of the residents near the proposed facilities. Respondents were also asked about the importance of the siting of the repository to Utah and whether they think it would influence the environmental quality of the local area. In addition to these data, several basic demographic characteristics of the population were also collected, including education, occupational status, religion, and political preference.

The major issues of interest in the present study include 1) the effects of respondent knowledge of nuclear waste disposal issues on opinions of health effects and tourism, particularly as they are affected by visitation patterns, and 2) the effects of occupation and education (in particular) on knowledge of nuclear waste disposal issues and opinions on technical and non-technical aspects of siting the repository.

Preliminary results indicate that only about 40 percent of the respondents have visited the national parks in southeastern Utah, but over 70 percent feel they are informed about the issues associated with siting the repository. Over 60 percent of the respondents were very concerned about the possible negative effect the repository could have on jobs, tourism, health effects, and environmental quality. Cross-tabulations indicate that the respondents self rating on knowledge of nuclear disposal issues has a statistically significant influence on responses to socioeconomic issues, yet the same self rating scale is significantly influenced by the frequency with which respondents have visited the national parks in southeastern Utah.

#### INTRODUCTION

In 1982, the U.S. Congress enacted the Nuclear Waste Policy Act in order to define the methods to be used in the development of a high-level nuclear waste repository. It is expected that the selection of the first repository will occur in 1991, and the repository is scheduled to open in 1998. By the year 2000, approximately 40,000 tons of radioactive spent fuel from commercial nuclear power plants will be buried.

Early in the selection process, two sites in the state of Utah were identified as potential sites for the repository. Soon after this decision was made public, numerous local and national environmental organizations voiced a strong opposition to the choice of Utah as a possible site for the repository. The issue raised most often by these organizations was the fact that the two sites in Utah, Davis Canyon and Lavender Canyon, were located adjacent to several local national parks. It had been suggested that if the repository were sited in one of these two areas, the local tourist industry would be devastated and the scenic beauty of the areas would forever be ruined. Interestingly, the politicians in the affected areas had expressed some support for the repository being located in their county because of the anticipated boost to their faltering economy.

In early 1984, the Division of Social Science Research at the University of Utah decided to include in its first statewide survey of Utah residents, questions about the possible choice of the state sites for the nation's first nuclear waste repository. Of particular interest was the statewide view of the possible choice of Utah sites with regard to jobs, health effects, tourism, and environmental quality as a function of the frequency of use of the national parks and a self rating of knowledge of nuclear waste disposal issues and technology.

#### DATA AND METHODS

In November of 1984, the DSSR at the University of Utah conducted a statewide survey of 1,000 randomly chosen residents using a random-digit dialing survey technique. Included in the questionnaire were seven questions on nuclear waste issues. They were:

1. We are interested in the visitation patterns of Utahns to the national parks in southern Utah since the parks have been a recreation destination for many Utahns. In the last five years, how many times do you think you have visited?:

Canyonlands National Park  
Arches National Park  
Capitol Reef National Park

2. The U.S. Department of Energy has included the Gibson Dome area in southeastern Utah as a possible location for a nuclear waste site. How important do you think this issue is, where 1 is very important, 2 is somewhat important, 3 is middle of the road, 4 is somewhat unimportant, and 5 is very unimportant?

Very Important					Very Unimportant
1	2	3	4	5	

3. To what extent do you think modern technology is capable of developing safe methods for long-term disposal of radioactive wastes with 1 being the most capable and 5 being the least capable?

Most Capable				Least Capable
1	2	3	4	5

4. To what extent do you think the environmental quality will change in southeastern Utah if a nuclear waste site is located at Gibson Dome, with 1 being no deterioration and 5 being serious deterioration?

No Deterioration				Serious Deterioration
1	2	3	4	5

5. How many jobs do you think will be created in southeastern Utah if a nuclear waste site is located at Gibson Dome, with 1 being many new jobs, 2 being some new jobs, 3 being no new jobs, 4 being the loss of some current jobs, and 5 being the loss of many current jobs?

Many New Jobs	Some New Jobs	No New Jobs	Loss of Some Cur- rent Jobs	Loss of Many Cur- rent Jobs
1	2	3	4	5

6. How much do you think tourism will be affected in southeastern Utah if a nuclear waste site is located at Gibson Dome, with 1 being more visits, 2 being some additional visits, 3 being no change, 4 being somewhat fewer visits, and 5 being far fewer visits?

More Visits	Some Additional Visits	No Change	Somewhat Fewer Visits	Far Fewer Visits
1	2	3	4	5

7. How much do you think the health of residents near Gibson Dome will be affected if a nuclear waste site is located there, with 1 being no health risk to area residents and 5 being a substantial health risk to area residents?

No Health Risk to Area Residents				Substantial Health Risk to Area Residents
1	2	3	4	5

Also included in the survey were questions on basic demographic characteristics of the respondents including age, sex, education, political outlook, and occupation.

Presented here are some preliminary results of the first portion of the data analysis in the form of frequency distributions and cross-tabulations.

## RESULTS

### Frequency Distributions

Self rating on knowledge of nuclear waste disposal issues.

	<u>Percent</u>
Very informed	17.5
Somewhat informed	53.1
Not very informed	29.4

Number of visits in past five years to Canyonlands National Park.

0	59.4
1	19.7
2+	20.9

Technology ability to dispose of nuclear waste.

Most capable	16.7
Somewhat capable	19.4
Possibly capable	35.2
Somewhat incapable	12.5
Least capable	16.2

Environmental quality change at Gibson Dome.

No deterioration	- 1	6.5
	- 2	9.6
	- 3	25.9
	- 4	23.0
Serious deterioration	- 5	35.0

Job change in SE Utah with waste site.

Many new jobs	16.8
Some new jobs	59.8
No new jobs	15.4
Loss of jobs	8.0

Tourism in SE Utah.

Many more visits	2.5
Some additional visits	6.4
No change	28.8
Somewhat fewer visits	28.3
Many fewer visits	34.0

Health effects near the site.

No health risk	- 1	12.5
	- 2	11.0
	- 3	25.5
	- 4	19.2
Substantial health risk	- 5	31.5

Cross-Tabulations

We are not only interested in the relative frequency with which the respondents have answered certain questions, we are also interested in the possible effects of specific characteristics of the respondents on their responses to certain questions. For example, how might the self rating on nuclear waste disposal issues be influenced by the frequency with which the respondents have visited the southern Utah national parks? Are responses to standard socioeconomic issues such as jobs, tourism, health effects, and environmental quality influenced by how informed the respondents view themselves on nuclear waste issues? Is there a relationship between how informed respondents view themselves and their level of education? And finally, is there a relationship between views on these standard socioeconomic issues and the frequency of visits to the nearby national parks?

"Frequency of visits to Canyonlands" by "self rating scale on level of information."

Visits to Canyonlands	Very Informed	Somewhat Informed	Not Very Informed	Total
0	13.0	54.7	32.3	100.0
1-2	22.3	52.9	24.8	100.0
3-4	24.2	46.8	29.0	100.0
5+	28.6	46.0	25.4	100.0

[S <0.01]

"Self rating scale on level of information" by "technology's ability to dispose of nuclear waste."

	Capable	Indifferent	Incapable	Total
Very informed	39.2	30.4	30.4	100.0
Somewhat informed	36.9	34.9	28.2	100.0
Not very informed	32.8	39.2	28.0	100.0

[S <0.01]

"Self rating scale on level of information" by "environmental quality change in SE Utah."

	No Deterioration		Serious Deterioration			Total
	1	2	3	4	5	
Very informed	11.3	12.5	15.5	20.2	40.5	100.0
Somewhat informed	4.6	10.3	26.9	24.0	34.3	100.0
Not very informed	7.2	6.5	30.8	22.8	32.7	100.0

[S <0.01]

"Self rating scale on level of information" by "job change in Utah."

	New Jobs	No Change	Loss of Jobs	Total
Very informed	80.7	14.5	4.8	100.0
Somewhat informed	75.3	17.0	7.7	100.0
Not very informed	76.6	13.4	10.0	100.0

[S <0.01]

"Self rating scale on levels of information" by "tourism in SE Utah with waste site."

	More Visits	No Change	Fewer Visits	Total
Very informed	6.4	32.6	61.0	100.0
Somewhat informed	7.7	28.2	64.1	100.0
Not very informed	12.3	27.7	60.0	100.0

[S <0.01]

"Self rating scale on level of information" by "health risk".

	No Health Risk			Significant Health Risk		Total
	1	2	3	4	5	
Very informed	22.3	10.8	22.3	10.8	33.8	100.0
Somewhat informed	10.5	12.8	26.0	21.9	28.8	100.0
Not very informed	10.4	7.8	26.7	20.0	35.1	100.0

[S <0.01]

"Level of education" by "technology's ability to dispose of nuclear waste."

Grade Completed	Capable	Indifferent	Incapable	Total
1-11	33.0	35.1	31.9	100.0
12	33.3	37.0	29.7	100.0
13-15	34.9	35.9	29.2	100.0
16+	42.3	32.2	25.5	100.0

[S <0.01]

DISCUSSION

In the data presented above, the three independent variables frequency of visits to canyonlands in the last 5 years, self rating scale on level of information, and respondents' level of completed education- each had significant effects on responses to issues of tourism, health effects, environmental quality, jobs, and respondents' views regarding the ability of technology to dispose of nuclear wastes.

The first cross-tabulation examines how well informed on nuclear waste issues respondents' view themselves as a function of the frequency with which they have visited the local national parks in the previous 5 years. The data presented here are for visitation only to Canyonlands National Park. Results indicate that over twice as many respondents (28.6%) who visited Canyonlands five or more times considered themselves well informed on nuclear waste issues by comparison to those who never visited Canyonlands (13.0%).

The second cross-tabulation indicates that those who considered themselves very informed on nuclear waste issues were more inclined to consider technology capable of safely disposing of the nuclear waste by comparison to those who considered themselves not very informed. Subsequent cross-tabulations found that, in comparison to respondents who viewed themselves as not very informed on nuclear waste issues, "very informed" respondents were more likely to believe that the siting of the repository in SE Utah would cause serious deterioration of environmental quality, would be less likely to create a loss of jobs, and would be less likely to have serious health effects. Finally, there was a positive relationship between level of completed education of the respondents and their views on the capability of technology to safely dispose of nuclear waste. All of the relationships between the independent and dependent variables shown here are statistically significant.

The preliminary results indicate that the majority of the residents of Utah are concerned about the social, economic, and health effects of siting a repository in their state. However, the concerns are strongly influenced by the frequency with which they have visited their local national parks, how well informed they view themselves on nuclear waste issues, and their level of completed education.

Previous research in the area of public opinion on nuclear waste issues indicates that public concerns over nuclear waste began to increase in the late seventies,<sup>1</sup> and since then there has been a consistent national and local opposition to the construction of nuclear waste facilities.<sup>2,3</sup> The greatest concerns, whether expressed regarding nuclear power plants or nuclear waste facilities, are socioeconomic issues such as health and economic consequences and effects

on local agriculture and businesses.<sup>4,5</sup> In a study addressing directly the responses of local Texas residents to a possible repository in their state, Brody<sup>3</sup> found that there was strong local opposition to the construction of a nuclear waste repository from respondents in the counties under consideration. The concerns were raised about effects on agriculture and possible health and environmental effects of the repository.

This study adds to the growing body of literature that addresses public concerns about nuclear waste issues. Although it is difficult to compare these results to previous research on this topic and it is inappropriate to generalize beyond the study area, results of this research indicate that serious concerns are now being raised by Utah residents on the issue of a possible nuclear waste repository in their state. These views are significantly influenced by level of completed education, frequency of visits to local national parks, and how well informed respondents' view themselves in nuclear waste issues.

#### REFERENCES

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