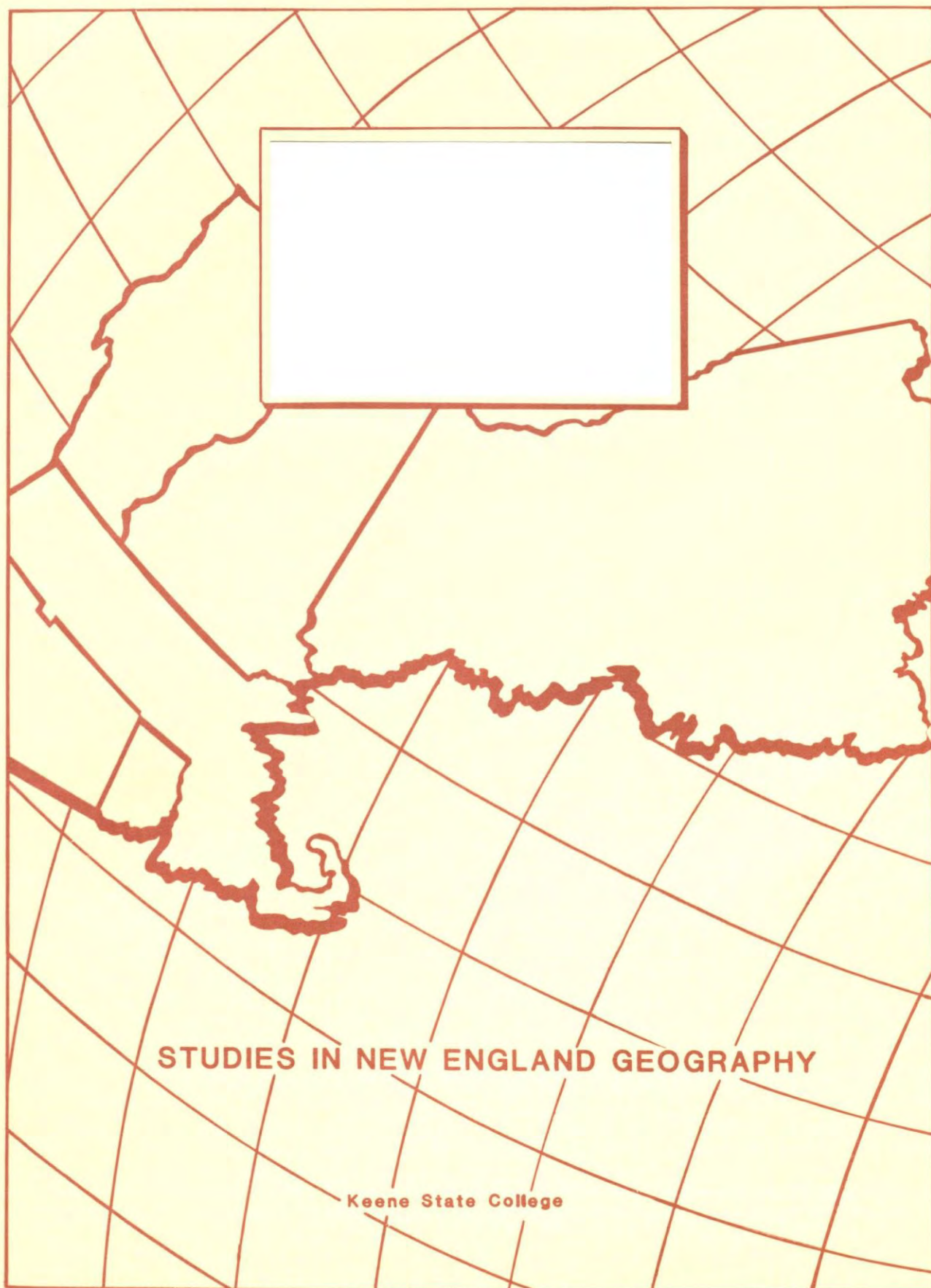




STUDIES IN NEW ENGLAND GEOGRAPHY

Keene State College

NOT IN MY BACKYARD: SITING A
REGIONAL SOLID WASTE LANDFILL

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INTRODUCTION

The American economic system has produced countless benefits for our citizens while simultaneously producing seemingly intractable environmental problems. The former include a more healthful and longer life and opportunities for financial and educational advancement; the latter may appear as increased urban crowding and pollution, resource exploitation, and a degradation of our air, soil and water supplies. From a resource perspective one of the most serious losses is occurring in our nation's groundwater supply which is being contaminated at an alarming rate by industrial, municipal, and even individual pollution. While on a national scale progress is evident, instances of local contamination continue to impinge on local supply, viz. Woburn, Massachusetts, the James River in Virginia, and Milford, New Hampshire.

Recent studies have demonstrated that one major culprit in water pollution centers around the community-based landfill, which ultimately leaks or leaches potentially harmful contaminants into proximate aquifers. Consequently, governments are increasingly mandating the closure of local dumps and the construction of better-engineered, double-lined regional landfills, "sited" using more stringent environmental controls. Creating regional landfills, however, often only compounds the perceived environmental problems, especially in the minds of those who face the prospect of having such a "noxious" facility as a neighbor.

It is just this prospect which is the focus of this paper. Here we will, by way of a public opinion survey, examine how a community faces its selection of a finalist in the search for a regional solid waste landfill site, and perhaps, in the long-term, for associated trash-to-energy plant/ash disposal facility. The town is Chesterfield, New Hampshire, a rural community in the

southwestern corner of the state. Our research focuses on resident perceptions and attitudes because a number of studies have indicated that they are often key parameters in the siting process.

Ostensibly, we will test the acceptability of such a facility via a concept known as the NIMBY Syndrome - not in my backyard. NIMBY is based on the simple principle that disposal is fine as long as it occurs "there" and not "here," that is, in someone else's backyard. Further, we will endeavor to apply our local findings to the larger trash management scenario in order to provide for a more efficient system of disposal and management.

In the following section of this study, we will examine the dilemma of trash management, its associated siting problems, and the concept of NIMBY. Next, the local management system will be reviewed, followed by data presentation and analysis. The study will conclude with a summary of the findings, notes regarding policy implications, and recommendations for future research.

THE DILEMMA OF TRASH

Average per capita production of trash in the United States has consistently increased from 2.75 pounds/day in 1920 to approximately 4.5 pounds/day in 1980; industry produces an average of about six pounds/day (Waste Age, 1986). From a national perspective, this translates into more than three billion tons annually, with disposal costs exceeding \$4 billion a year (Rydant, 1987). The costs and problems associated with disposal are rising rapidly as

we run out of suitable dumping sites and as citizens and communities refuse to accept someone else's trash. Perhaps the most telling example of the disposal dilemma was seen in the recent and much publicized 6000 mile odyssey of the New Islip, New York garbage barge. For months the trash-laden tow plied the Atlantic and Caribbean trying to find a home. No fewer than four nations turned it away. When it finally did find a resting place, ironically back where it originated, it was incinerated. Yet local officials refuse to allow the ash to be buried because of its potentially toxic makeup, thus pointing out another serious issue facing trash management officials. As landfilling declines and incineration increases, ash disposal constitutes an even more serious dilemma since ash often concentrates known hazardous materials and must now be treated as hazardous waste (Meadows, 1987b). While waste reduction does reduce volume by more than 90 percent, it simultaneously introduces (due to incomplete combustion) such environmental and health issues as the production of dioxins and the concentration of heavy metals and chemicals in the ash (see, for example: Moldenhauer, 1982).

With municipal landfilling costs now averaging \$25/ton, with some ranging up to \$100/ton, towns are scrambling for more cost effective solutions (Abelson, 1987). The major disposal options available today include the local town dump, a regional landfill, and various forms of incineration, some including the familiar trash-to-energy option. While recycling and trash reduction programs are also available, they usually receive scant attention and are often considered as minor supplements to the landfill or incineration program. Borelli notes that more than 90 percent of our trash is dumped in landfills, many of which are already loaded to capacity and at least half of which are expected to close by the turn of the century (Borelli, 1982).

Indeed, in many jurisdictions the local town dump is no longer an option as towns scurry to protect their local environment, especially aquifers, and comply with state regulations mandating closure. For the most part, then, trash management officials are limited to either the regional, sanitary landfill, incineration, and trash-to-energy plants, or some combination thereof. Increasingly the landfill, in combination with the trash-to-energy unit, is touted as the most viable, ostensibly because co-generation helps to reduce overall dumping costs, in some cases by up to 20 percent (Winchester Landfill Study...1987). In New Hampshire plans for no fewer than 17 such plants are now weaving their way through the regulatory system (Meadows, 1987a). Yet in virtually every jurisdiction, pre-construction opposition to the landfill and/or plant is apparent, even though opponents would also be contributors of trash.*

Such opposition has been demonstrated on numerous occasions for numerous facilities. Dear (1978) and Smith and Hanham (1981) found local residents unwilling to host mental health care institutions in their neighborhood and alluded to similar resident positions for group homes and prisons. Indeed such facilities are now commonly referred to as "noxious" and nobody wants one in their backyard. Landfill opposition appears almost universal (at least prior to development) and is "very often unacceptable due to the public's fear of the impacts of a landfill" (Furuseth and Johnson, 1988:137).

* A recent study of an operational landfill in North Carolina indicates that public opposition is not always present for well-run landfills; the implications for pre-construction site planning are obvious (see Furuseth and Johnson, 1988).

The NIMBY syndrome ranges from prisons to toxic waste dumps, but the public clearly regards the latter, along with nuclear plant sites, as the most unacceptable (Mitchell and Carson, 1986). There is thus a need to rate degrees of "noxiousness" and discuss it in terms of risk acceptability and cost/benefit analysis (see, for example: Miller, 1985 and Russell, 1986).

Many communities live in fear of being selected as a site for waste disposal. They recollect issues and publicity about Love Canal, of Elizabeth, New Jersey (Chemical Control Corporation), and of Jackson Township, New Jersey (Morell and Magorian, 1982; Moldenhauer, 1982). The publicity surrounding the contamination of public water supplies via illicit dumping or inadvertant chemical leaks (Piper and Ladd, 1985; Elfving, 1986; and Lagos, Wessen, and Zelen, n.d.) creates a strong sense of public opposition to any form of dumping or disposal. In fact, this local opposition is seen by some as the greatest hurdle to successful siting of (hazardous) waste facilities in the United States. NIMBY aptly describes public concerns about protecting the environment and local property values, the fear of health risks, distrust of governmental institutions, and preserving the community (Morell, 1984). Other research bases NIMBY on equity factors and the geographic disparity between risks and benefits, that is, where risks are spatially concentrated in the host community while benefits are geographically dispersed amongst waste contributing communities (National Governor's Association, 1981).

Clapham (1985) notes that NIMBY, as it represents public opposition, may be the only mechanism by which citizens can truly participate in trash management decision-making, control their personal destiny, prevent a trampling of their

rights by corporations, protect property values, and safeguard the health and welfare of their families and environment. Further, he states that NIMBY "has been a remarkably effective tool for organizing successful grassroots resistance ... and that NIMBY, [in fact], comes from the core of the American character" (Clapham, 1985:10). Indeed, this appears most appropriate in New England, where its strong Yankee and local town government traditions are the very essence of participatory democracy.

To date most research which reports public concerns about a noxious neighbor has been conducted on such facilities as hazardous waste dumps, nuclear power plants, or prisons. Few studies have explicitly examined the role of the sanitary landfill. Are the results from previous research directly transferable to landfills, which, when "properly designed and operated..., are reasonably safe and effective" (Keller, 1976)? With these ideas in mind we set out to examine public perceptions in a community recently selected as a finalist in the site selection process for a regional landfill and (eventual) trash-to-energy/ash disposal facility. We sought to determine the presence or absence of NIMBY and, if present, those factors on which it might be based. Hazards and risk assessment research suggested that we examine several basic socio-economic parameters which might be tied to NIMBY (see, for example, Kates (1977) and Hance, Chess, and Sandman, 1988). We tested concepts that Morell (1984) suggested may be linked with a desire to preserve local environments and maintain the community heritage or property values. The often cited concerns of traffic, environmental degradation, and distance from the proposed site are also examined (Furuseth and Johnson, 1988).

THE SOUTHWEST SOLID WASTE MANAGEMENT DISTRICT
AND CHESTERFIELD, NEW HAMPSHIRE

THE DISTRICT

In the early 1980's the state of New Hampshire passed legislation that would, in essence, force the closure of small (town-based) and often polluting landfills by 1988. Designed ostensibly to protect groundwater supplies, the laws forced many communities to seek alternate trash-disposal methods. In 1983 additional legislation (RSA-149-M) required towns to join together in regional districts to address solid waste planning issues. In the following year, 22 towns (Table 1 and Figure 1) in the southwestern corner of the state formed the South West Solid Waste Management District (SWSWMD) under 149-M (Winchester Landfill Study...1987). These communities (see Figure 1) undertook a comprehensive study to locate a regional, lined, state-of-the-art solid waste landfill. Thirty-one sites were initially identified, later narrowed to 10, and finally reduced to three; one each in Keene, Winchester, and Chesterfield. The Keene site was quickly eliminated due to its limited capacity and potential hydrogeologic problems. In July, 1986, the SWSWMD announced its decision to begin studies on the suitability of the remaining two sites, thus providing us the opportunity to view resident perceptions and attitudes toward their selection. The District announced that six disposal options were under review, but it quickly became obvious that the regional landfill was the favored choice, ostensibly because it represented the least cost alternative (Table 2). With estimated disposal costs at \$27.50/ton the landfill was seen as most acceptable by area communities. (The 350 TPD trash-to-energy plant is included for cost comparisons; member towns do not currently generate sufficient trash to fuel the 150 TPD facility.)

TABLE 1
MEMBER COMMUNITIES OF THE SOUTHWEST SOLID WASTE
MANAGEMENT DISTRICT (SWSWMD)

<u>Communities</u>	<u>Estimated 1986 Population</u>	<u>Current Disposal Facility</u>	<u>53-B* Member</u>
Alstead	1,580	Keene Landfill	yes
Chesterfield	2,760	Keene Landfill	yes
Dublin	1,480	Jaffrey Landfill	yes
Fitzwilliam	1,890	Jaffrey Landfill	yes
Gilsum	840	Keene Landfill	yes
Harrisville	1,170	Harrisville Landfill	yes
Hinsdale	3,770	Hinsdale Landfill	yes
Jaffrey	4,670	Jaffrey Landfill	yes
Keene	22,770	Keene Landfill	yes
Marlborough	1,910	Marlborough Landfill	yes
Marlow	590	Keene Landfill	yes
Nelson	530	Keene Landfill	yes
Richmond*	670	Winchester Landfill	no
Roxbury	200	Marlborough Landfill	yes
Stoddard	620	Keene Landfill	yes
Sullivan	680	Keene Landfill	yes
Surry	680	Keene Landfill	yes
Swanzey	5,710	Keene Landfill	yes
Troy	2,330	Troy Landfill	yes
Walpole	3,230	Walpole Landfill	no
Westmoreland	1,650	Keene Landfill	yes
Winchester	4,060	Winchester Landfill	no
TOTAL	63,780		

*Ashuelot Valley Refuse Disposal District member.

(Sources: New Hampshire Office of State Planning.
Kimball Chase Company, Inc., Solid Waste Management Planning Study,
January, 1987.)

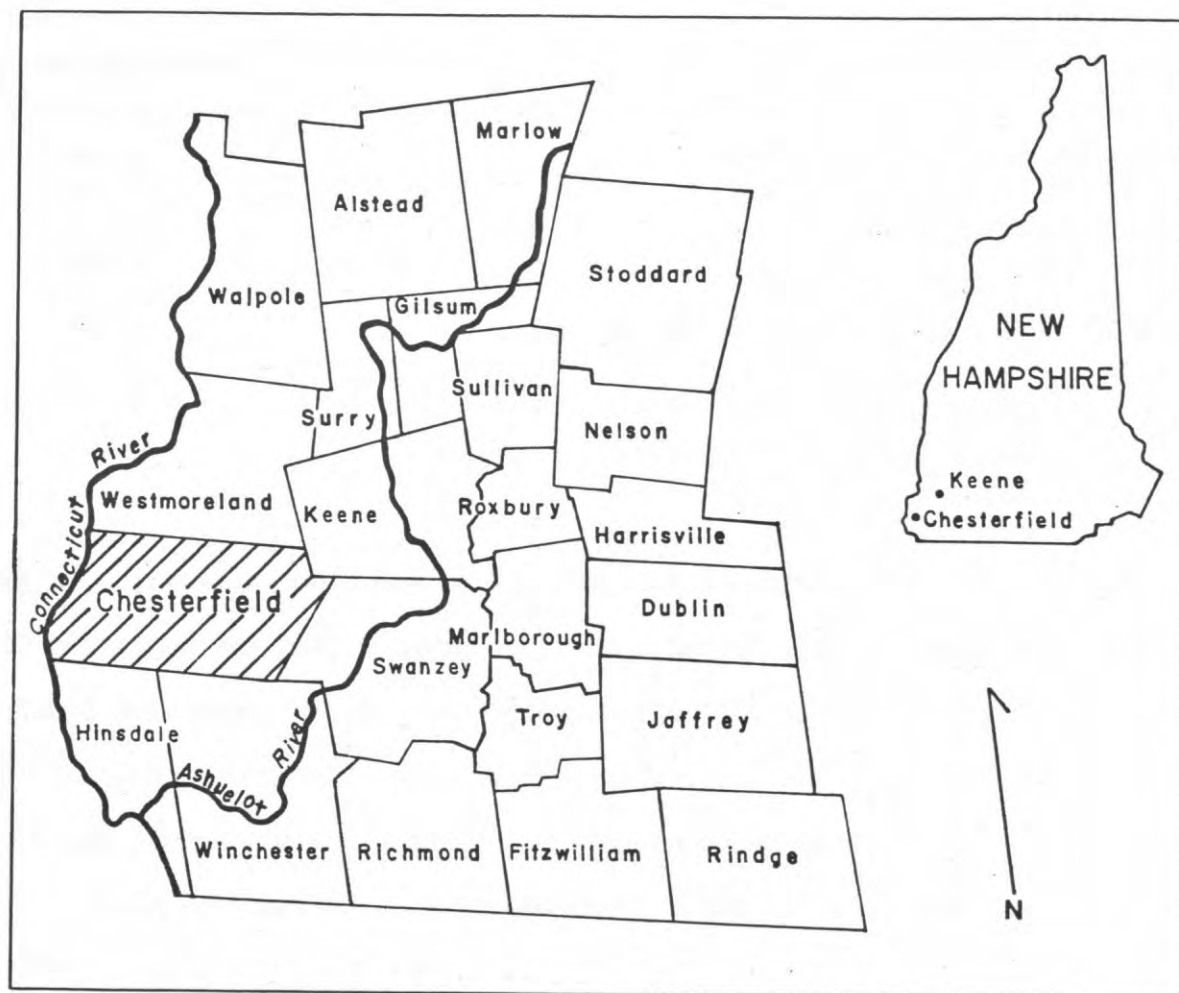


Figure 1: Location of Chesterfield

TABLE 2
DISPOSAL OPTIONS AND DISPOSAL COSTS

Disposal Option	Costs per Ton (\$)
150 TPD Trash-to-Energy Plant*	45.50
225 TPD Trash-to-Energy Plant	31.00
350 TPD Trash-to-Energy Plant	27.50
Regional Landfill	27.50
Dispose of Elsewhere	42.00
Individual (Town) Landfills	122.50

* TPD - tons per day
(Source: Public Opinion Study...1986, p. 28.)

Immediately upon learning that Chesterfield was a potential site, a group of residents formed a well-funded opposition group called the Concerned Citizens of Chesterfield (CCC). They recognized that public opposition based on emotionalism would not effectively serve their interests so their goal was to participate in the siting decision with positions based on factual and documented evidence. One piece in their fact-finding mission was to support our independent survey of public opinion, which was conducted in October, 1986.

CHESTERFIELD, NEW HAMPSHIRE

Chesterfield is a rural town of 2700 (1986) in southwestern New Hampshire (see Figure 1). It is primarily a residential community with many residents commuting to work in Keene or Brattleboro, VT, which borders Chesterfield to the west, across the Connecticut River. In recent years the town has witnessed respectable growth in both business activity and population, which is projected

to increase by some 40 percent by the turn of the century (Southwest Region Planning Commission, 1986). Spofford Lake, located centrally, represents a major regional recreational opportunity, as does Pisgah Wilderness Park, less than one mile from the proposed landfill site.

The town's demographic structure is not unlike that of surrounding communities, although lakeshore residents of Spofford Lake do appear to have a higher average income than most other residents (Spofford Lake Study, 1987). The average household size is 2.78 persons with an age distribution as follows: 27.8 percent under 18 years, 61.3 percent from 18-64 and 10.9 percent aged 65 or over (U.S. Bureau of Census, 1980).

Focusing on NIMBY and resident perceptions/awareness let us now turn to an analysis of our survey data.

DATA ANALYSIS

The data for this study was collected during the fall of 1986 from interviews with 112 residents of Chesterfield. A random sample was selected from each of the three settlement clusters or zones in the town (Spofford, Chesterfield, and West Chesterfield). The survey was administered by face-to-face interviews, with a less than one percent refusal rate.

The questionnaire (Appendix A) asked respondents to provide information in four basic areas: background demographic data; concepts related to issue familiarity; perceived concerns about possible landfill impacts and related costs; and a series of questions designed to test directly the presence or absence of the NIMBY syndrome. By asking demographic and socio-economic questions, we hoped to be able to determine their salience to concerns and, further, how they might be associated with NIMBY. Previous research has often failed to provide such links, leaving one to speculate on those factors that underly NIMBY. As is common in most social science research, frequency distributions and the Chi-square (X^2) test of association were used to determine statistical association between relevant variables (Nie, et al, 1975).

Finally, we should note here that the demographic data from our sample was compared with that for residents of Chesterfield using the 1980 census as a baseline. No significant differences were evident.

FAMILIARITY WITH THE REGIONAL LANDFILL ISSUE

Informed judgment is obviously dependent upon knowledge or information about an issue and is key to the decision-making process. To determine its effect here we asked respondents how familiar they were with the landfill issue. A majority (60 percent) considered themselves "familiar" with the issue and able to make valid judgments. Thirty percent felt they were "not familiar," while only ten percent considered themselves "very familiar" with the issue (Figure 2). There was no significant association between the sex of the respondent and their level of familiarity, yet older people tended to claim a higher level of familiarity than younger respondents (Table 3). Individuals in the sixty to seventy year age group were most likely to claim they were "very familiar"; the fifty to sixty year age cohort had the greatest percentage of group members claiming to be "familiar" with the issue. Significantly, people below forty years of age had the greatest likelihood of responding that they were "not familiar" with the regional landfill issue.

Figure 2

Level of Familiarity with Landfill Issues
(n = 112)

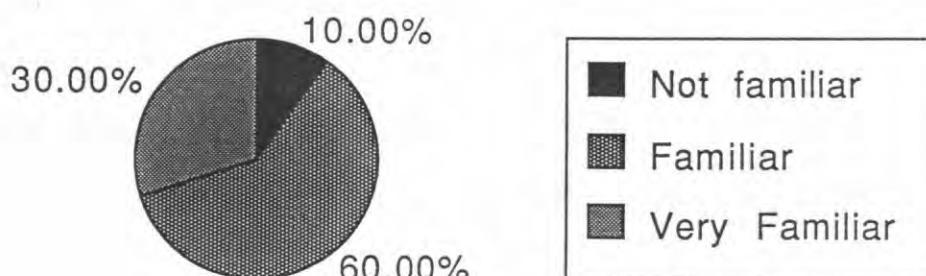


TABLE 3
AGE BY FAMILIARITY WITH LANDFILL ISSUE

Familiarity Level	Age (Years)											
	20-30		30-40		40-50		50-60		60-70		70+	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Not Familiar	9	41	13	41	2	13	0	0	6	46	4	24
Familiar	12	55	19	59	11	69	11	92	4	31	10	59
Very Familiar	1	5	0	0	3	19	1	8	3	23	3	18
TOTAL	22	100	32	100	16	100	12	100	13	100	17	100

 $\chi^2 = 21.24$

Sig. at .02

N = 112

Although there was no significant association between income and familiarity those in the highest annual income bracket (\$50,000+) displayed the greatest number "very familiar" with the issue, while the \$10,000-\$14,999 bracket had the greatest number of respondents claiming to be "not familiar" with the landfill issue (Table 4).

There was a fairly strong association between how long a person has lived in Chesterfield to how familiar they were with the issue (Table 5). Those who had resided in town more than five years were most aware (14 percent) while some 62 percent felt they were generally aware of the development. Almost two-thirds of the newer residents, i.e., less than one year residency, were not familiar with the proposed project. Many of the longer term residents compared the proposed landfill to the building and subsequent alteration of NH Route 9, the recently completed upgrading of the main east-west highway through town.

TABLE 4

INCOME BY FAMILIARITY WITH LANDFILL ISSUE (PERCENT)

Familiarity Level	Income (000's of dollars/year)									
	0-9.9	10-14.9	15-19.9	20-24.9	25-29.9	30-34.9	35-39.9	40-44.9	45-49.9	50+
Not Familiar	40	46	50	31	17	27	0	33	100	0
Familiar	60	27	43	63	67	73	100	67	0	80
Very Familiar	0	27	7	6	17	0	0	0	0	20
TOTAL	100	100	100	100	100	100	100	100	100	100

N = 83

TABLE 5

TIME IN CHESTERFIELD BY FAMILIARITY WITH LANDFILL ISSUE

Familiarity Level	Years in Chesterfield					
	0 - 1		1 - 5		5+	
	No.	%	No.	%	No.	%
Not Familiar	11	65	6	25	17	24
Familiar	5	29	18	27	44	62
Very Familiar	1	6	0	0	10	14
TOTAL	17	100	24	100	71	100

 $\chi^2 = 15.34$

Sig. at .004

N = 112

Most of the comments were of the, "they'll do whatever they want, no matter what we say" variety. Clearly residential tenure in the community bears an important relationship to issue knowledge.

There was a moderately strong association between the amount of land owned and familiarity, with those respondents owning two or fewer acres of land being the most likely to be "not familiar" with the landfill issue, but that may be related more to local zoning regulations than to actual issue factors. Similarly, we found no significant statistical association between perceived distance (residence) from the site and familiarity with the issue, even though most other research finds such a link (see, for example, Klee (1968), Dear (1978), and Furuseth and Johnson (1988)).

CONCERN ABOUT THE REGIONAL LANDFILL ISSUE

Virtually all of our respondents (82 percent) expressed anxiety about their town as a possible landfill site. This was true when measured against sex, age, education, income, occupation, or distance from the proposed site. Such high levels of concern were not unexpected, so we asked residents to note their level of concern for such issues as water, soil, and air pollution, the possible visual impacts of a dump and related traffic flow, as well as any perceived impacts on local land values. The results in Table 6 show the highest concern was for traffic (46 percent), followed closely by water and land value impacts, each noted by one-third of our sample. In all cases no fewer than 71 percent of the respondents said they were either concerned or very concerned about all the possible environmental impacts noted in Table 6. With traffic (82 percent), water (80 percent), and land value (75 percent) leading the way, clearly our group sees serious negative impact arising on the local level as a result of potential development.

TABLE 6

LEVEL OF CONCERN ABOUT POSSIBLE LANDFILL EFFECTS
ON THE LOCAL ENVIRONMENT

Effects on...	Level of Concern (Percent)				TOTAL
	Not Concerned	Concerned	Very Concerned	Unsure	
Water	17	47	33	3	100
Soil	21	45	27	7	100
Air	23	42	29	6	100
Visual	26	41	30	3	100
Traffic	18	36	46	0	100
Land Value	21	42	33	4	100

N = 112

TABLE 7

DISTANCE FROM SITE BY CONCERN ABOUT TRAFFIC

Perceived Distance (Miles)												
Level of Concern	< .5		.5 - 1		1 - 2		2 - 3		3 - 4		4+	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Not Concerned	1	17	2	17	6	17	2	7	2	11	4	50
Concerned	1	17	9	75	11	31	10	36	5	28	3	38
Very Concerned	4	67	1	8	19	53	16	57	11	61	1	13
TOTAL	6	100	12	100	36	100	28	100	18	100	8	100

 $\chi^2 = 21.62$

Sig. at .02

N = 108

While, as before, occupation did not appear to impact or affect apprehensions expressed (ostensibly because most residents expressed high levels of concern, thus mitigating against significance with the χ^2 test), there was a fairly strong association between the distance of a respondent's home from the site (as perceived by the respondent) and misgivings about possible effects on traffic, i.e. proximate residents registered most concern (Table 7). Those residing closest to the site had the greatest percentage of people "very concerned" about traffic; respondents living farthest away registered the highest level of "not concerned."

Moreover, there was an association between residential tenure and uneasiness about possible effects on traffic (Table 8). The longer a respondent had lived in Chesterfield the more likely he/she was to express a higher level concern here. Fully 90 percent of those with five or more years in town expressed high levels of concern on this factor while almost one-half with a year or less residency said they were not worried about traffic. Perhaps a person having lived in Chesterfield for many years would be more apt to compare present and projected traffic levels to the much lower levels of years past and thus be more concerned. From this base of concerns we attempted to zero in on NIMBY.

CHOICE OF SOLID WASTE DISPOSAL OPTIONS

People were given a list of the five main waste disposal options noted earlier and asked which one they favored, not necessarily for a Chesterfield site, but in general. The regional trash-to-energy plant received the most support with forty-four percent (Figure 3). The next most popular choice was an individual town landfill (twenty-two percent), while the other options, such as "transfer elsewhere" (twelve percent), regional incinerator (seven percent), and a regional landfill (ten percent), received far less support. The majority

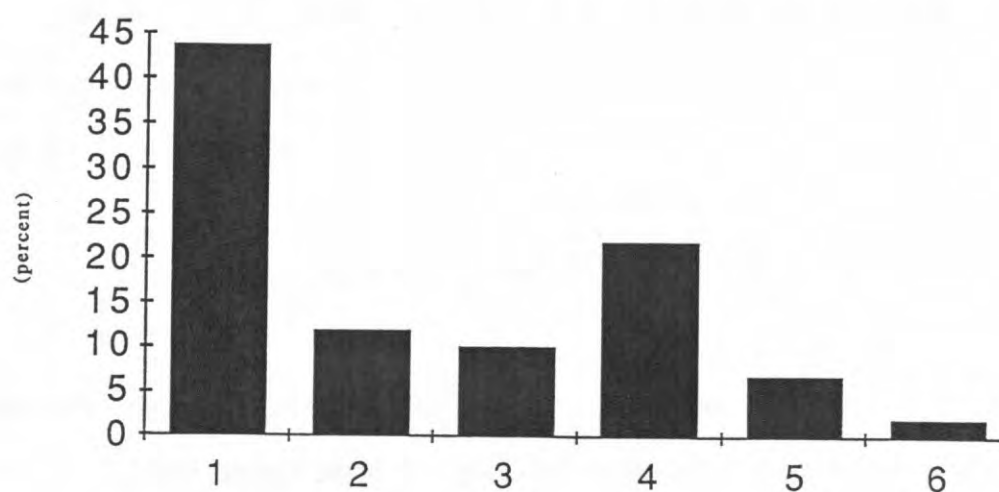
TABLE 8

TIME IN CHESTERFIELD BY CONCERN ABOUT TRAFFIC

Level of Concern	Time (Years)					
	0 - 1		1 - 5		5+	
	No.	%	No.	%	No.	%
Not Concerned	8	47	5	21	7	10
Concerned	4	24	12	50	24	34
Very Concerned	5	29	7	29	40	56
TOTAL	17	100	24	100	71	100
$\chi^2 = 11.56$ Sig. at .05 N = 105						

Figure 3

Favorability of Solid Waste Disposal Options



- 1 - Regional Trash-to-Energy Plant
- 2 - Transfer Elsewhere
- 3 - Regional Landfill
- 4 - Town Landfill
- 5 - Incinerator
- 6 - Other

(n=112)

of those favoring a trash-to-energy plant commented that the option sounded the best, "if they can make it safe." The desire for the individual town landfill seemed to come mostly from older people who preferred an "old fashioned town dump."

Although the popular choice was the trash-to-energy plant option, there was an interesting pattern visible where the two landfill choices were concerned. Respondents with income up to \$30,000 per year preferred the town landfill over its regional counterpart. For those making more than \$30,000 annually the reverse was true (Table 9). Speculating, one possible explanation for this trend is that people with higher incomes might have greater exposure or access to information concerning disposal options, such as trash-to-energy technology.

When asked if they would be willing to pay extra to obtain the disposal option of their choice a majority (sixty-eight percent) said yes. Twenty-two percent of the sample said they would not be willing to pay more, and ten percent were unsure. For those willing to pay, however, few could/would volunteer an amount; when pressed the most common response was a somewhat meaningless \$5.00. In and of itself however, the uncertainty here is important because it may point out a lack of in-depth knowledge about this aspect of the issue.

CHESTERFIELD AS A SITE FOR ALTERNATIVE DISPOSAL OPTIONS

This section focuses on four main solid waste disposal options, and resident perceptions and acceptability of them specifically in Chesterfield.

Chesterfield as a Regional Landfill Site

Not surprisingly, the overwhelming majority (88 percent) responded that they were not in favor of a regional landfill in Chesterfield. A small group

TABLE 9
INCOME BY DISPOSAL OPTIONS CHOICE (PERCENT)

Option Choice	Income (000's of Dollars/Year)									
	0- 9.9	10- 14.9	15- 19.9	20- 24.9	25- 29.9	30- 34.9	35- 39.9	40- 44.9	45- 49.9	50+
Trash-to- Energy	50	55	36	38	83	47	0	67	0	60
Transfer Elsewhere	0	27	21	0	0	0	25	17	100	0
Regional Landfill	25	0	0	6	0	27	50	17	0	20
Town Landfill	25	18	21	44	17	20	25	0	0	20
Incinerator	0	0	21	6	0	0	0	0	0	0
Other	0	0	0	6	0	7	0	0	0	0
TOTAL	100	100	100	100	100	100	100	100	100	100

N = 82

(7 percent) were willing to accept one and 5 percent said they were unsure about the issue (Table 10).

Statistically there was no X^2 association between distance from the site and favorability. Nor were there any significant relationships involving income or amount of land owned. These facts suggest that the opposition to a regional landfill is fairly universal within the community.

Chesterfield as a Regional Trash-to-Energy Plant Site

Sixty-four percent of the respondents replied that they would not be in favor of a trash-to-energy plant in town. Sixteen percent said they would support such a facility, while nine percent were unsure about their feelings (Table 10).

There were no associations between this parameter and education, income, sex, or age. This suggests that if people of higher education and/or income levels have greater access to information on trash-to-energy technology as speculated earlier, they are not heavily influenced by it.

Chesterfield as an Individual Town Landfill Site

When asked if they were willing to see an individual town dump in their community, fully 50 percent replied negatively. An important minority of forty-one percent said that they are in favor of a town landfill. Those unsure about their feelings on the issue accounted for nine percent of the respondents (Table 10).

Perhaps the best explanation for the "acceptability" of a town dump lies in a response of a long-term resident who said "we've always had a town dump,

TABLE 10

FAVORABILITY OF CHESTERFIELD AS A SITE FOR DISPOSAL OPTIONS

Disposal Option	Favorability						Total %
	No.	Yes %	No.	No %	No.	Unsure %	
Regional Landfill	8	7	98	88	6	5	100
Trash-to-Energy Plant	18	16	72	64	22	20	100
Town Landfill	46	41	56	50	10	9	100
Regional Incinerator	5	5	91	81	16	14	100

TABLE 11

AGE BY FAVORABILITY OF CHESTERFIELD AS A TOWN LANDFILL SITE

Age (Years)												
Favorability	20 - 29		30 - 39		40 - 49		50 - 59		60 - 69		70+	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	7	32	12	38	5	31	5	42	8	62	9	53
No	13	59	17	53	9	56	6	50	5	39	6	35
Unsure	2	9	3	9	2	12	1	8	0	0	2	12
TOTAL	22	100	32	100	16	100	12	100	13	100	17	100

N = 112

why change?" Although there was no solid relationship between residential tenure and favorability toward a landfill, there was a trend between age and favorability toward such an option (Table 11). In general, older people were more likely to favor an individual town landfill than younger residents. The 60-69 year age group had the highest percentage of group members responding favorably (62 percent), and the 20-29 year age cohort had the highest percentage of members responding negatively (59 percent). Perhaps older citizens are simply more used to having a "town dump" than are younger people.

Chesterfield as a Regional Incinerator Site

Eighty-one percent of respondents replied that they are not in favor of a regional incinerator in Chesterfield. Five percent said they would be in favor of an incinerator, and fourteen percent were unsure (Table 10). Interviewers noted that a number of the people replying negatively toward this option were not sure what one was, or what its effects might be. More than one respondent commented that, "the idea scares me." The cognitive connection between the technology of the trash-to-energy plant and the "incinerator only" option was apparently lacking here.

Taken as a whole, these data clearly support the existence of the "NIMBY" syndrome. Significantly fewer people responded favorably to both the regional landfill and trash-to-energy plant options when they were in the context of a Chesterfield site than when they were offered as site-independent options. Equally as significant is the amount of support, site-independent or site-dependent, for an individual town landfill.

CONCLUSIONS

Sanitary landfills are, and in the immediate future will continue to be, the primary means of waste disposal in the United States. The very nature of such a "noxious" facility and the difficulty of siting one mandates that public agencies devise more comprehensive and publicly sensitive siting procedures. Trash managers must be more cognizant of the issues, both real and perceived, facing those forced to live in proximity to a dump, for it is these very issues that are today emerging as perhaps the primary criteria for final site selection (see: Glaberson, 1988). This research has examined a base for some of these issues or concerns.

Overall, our data indicates the majority of respondents are not in favor of siting a regional, double-lined, state-of-the-art, solid waste landfill in Chesterfield. Public awareness and concern was high, as evidenced by the fact that more than 70 percent of the sample reported intimate knowledge of the proposed facility. Their levels of awareness or familiarity rose with age, income, length of residential tenure, and the amount of property owned in the community.

Moreover, local anxiety and concern ran high and focused, in order of importance, on traffic generation, water pollution, and potential property devaluation. Distance appeared important here; more proximate residents expressed higher levels of anxiety. Of the available trash disposal options presented, residents clearly favored the trash-to-energy plant (44 percent), followed somewhat distantly by a local town dump (22 percent), even though the latter is currently not feasible under existing state law.

In an explicit test of NIMBY, when asked which disposal option they supported or favored, independent of site, respondents almost invariably

qualified their answer, be it a trash-to-energy plant, landfill, or incinerator, by saying "yes, I support it - but not in Chesterfield." Every waste disposal option presented, except for one, received much more support when proposed as site-independent, than when suggested for the town of Chesterfield. The one choice that received more support was again the individual town landfill. This brings up an important component of the NIMBY syndrome, the resistance to change. The general response among people preferring a town dump in Chesterfield was, "we've always had one." It appears that such a facility is not perceived as threatening as is a regional landfill. While our research design did not address this issue, it does suggest that it may play an important role in project developments and is, consequently, worthy of greater attention in future research.

Proper decisions concerning solid waste disposal cannot be made on the basis of the NIMBY syndrome; they must be made on the basis of sound objective data. Thus, education of citizens about disposal options and their respective merits and drawbacks is the key to reducing the negative effects of NIMBY. Trash managers, such as those operating the Southwest Solid Waste Management District, must clearly dedicate greater resources to public education and its consequent public participation programs in order for their policies and projects to succeed. This educational process is, we believe, best approached at the regional level, because where the very important decision of how to manage solid waste is concerned, the environment is everyone's backyard.

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APPENDIX A

REGIONAL SOLID WASTE LANDFILL SURVEY

REGIONAL SOLID WASTE LANDFILL SURVEY

1. What is your: Sex _____ Age _____
 What is your spouse's: Sex _____ Age _____
2. How many people are in your household? _____
 What are their ages? _____
3. In what type of house do you live?
 single family ()
 multiple family ()
 apartment ()
 trailer ()
 condominium ()
 camp ()
4. Do you:
 rent ()
 own ()
 board ()
5. What is your level of education?
 elementary ()
 high school ()
 college ()
 post-secondary ()
6. What is your total family income?
 \$0-\$9,999 ()
 \$10,000-\$14,999 ()
 \$15,000-\$19,999 ()
 \$20,000-\$24,999 ()
 \$25,000-\$29,999 ()
 \$30,000-\$34,999 ()
 \$35,000-\$39,999 ()
 \$40,000-\$44,999 ()
 \$45,000-\$49,999 ()
 \$50,000 and up ()
7. What is your occupation? _____
8. What is your spouse's occupation? _____
9. What is your marital status?
 married ()
 single ()
 divorced ()
 widowed ()
10. How long have you lived in Chesterfield?
 0 - 1 year ()
 1 - 5 years ()
 5+ years ()
11. How many acres of land do you own in Chesterfield?
 0 _____ 0-2 _____ 2-5 _____ 5-10 _____ 10-15 _____ 15+ _____
12. How familiar are you with the Chesterfield regional solid waste landfill issue?
 not familiar _____ familiar _____ very familiar _____
13. Are you concerned about the Chesterfield regional solid waste landfill issue?
 yes _____ no _____ unsure _____

14. Please estimate how many miles your home is from the proposed landfill site.

less than .5 miles () 1-2 miles () 3-4 miles ()

1/2-1 mile () 2-3 miles () 4+ miles ()

15. How concerned are you about the following possible effects of the proposed solid waste landfill?

	Not Concerned	Concerned	Very Concerned	Unsure
effects on water	()	()	()	()
effects on soil	()	()	()	()
effects on air	()	()	()	()
visual effects	()	()	()	()
effects on traffic	()	()	()	()
effects on land value	()	()	()	()
other (explain)				

16. Would you participate in a recycling program?

yes _____ no _____ unsure _____

17. Who should pay to operate a recycling station?

individuals ()
 town government ()
 state government ()
 federal government ()
 other (explain)

18. Would you be willing to pay an extra amount in your taxes to operate a recycling station?

yes _____ no _____ unsure _____

IF YES, how much per year? \$0-\$5 _____ \$5-\$10 _____ \$10-\$15 _____

\$15-\$20 _____ \$20-\$25 _____ \$25-\$30 _____ \$30+ _____