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FACTORS CONTRIBUTING TO THE SITING
OF A LOW-LEVEL
RADIOACTIVE WASTE TREATMENT FACILITY

by

CHERYL VOLESKY, HONOURS B.COMM.

A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfilment of
the requirements for the degree of
Master of Management Studies

School of Business
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FACTORS CONTRIBUTING TO THE SITING OF A LOW-LEVEL
RADIOACTIVE WASTE TREATMENT FACILITY

submitted by Cheryl Volesky, Honours B.Comm.
in partial fulfilment of the requirements for
the degree of Master of Management Studies

Thesis supervisor

Thesis Co-supervisor

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ABSTRACT

An exploratory study examined six Ontario communities who volunteered to host a low-level radioactive waste management facility to determine if they possessed common characteristics. Overall, participating communities were small and experiencing a decline in both population and the number of employed persons. Economies tended to be simple and frequently supplemented by a high proportion of government related positions. Low-level radioactive waste production experience resulted in a reduced risk perception and greater acceptance of the project. Political support, power sharing, public participation and the ability to withdraw from the process at any time were strong incentives for volunteering. A lack of faith in government and institutions and a concern over effects on health and safety for present and future generations were disincentives.

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INTRODUCTION

Background

The waste facility siting process has become a major public policy issue that consumes a great deal of time and resources. There is a pressing need to minimize the unproductive time that characterizes the siting of low-level radioactive waste management facilities. Determining which factors are associated with a willingness to host such facilities is an important step in achieving success. The literature on the subject seems to indicate that the primary success factor is the approach taken by those responsible for finding a suitable site. There is also a genuine need for a better understanding of the public's views on site selection, radioactive waste management, health and safety, transportation, and ethical aspects of radioactive waste management. Risk assessment and mitigation must also be addressed as these contentious issues form an integral part of a site selection process.

Initially, sitings were carried out by the technical and scientific community who rarely interacted with the general public. In traditional Canadian practice, responsibility for the management of low-level radioactive wastes was assigned to the waste producers and the regulators. Their technical and exclusionary approach created a distrust between themselves

and the communities burdened with the waste. Host communities were left feeling powerless, without the means or authority to influence operations. They also became resentful and suspicious, which resulted in poor acceptance of waste management projects. A great number of siting failures signalled a need to employ a new approach.

Examination of past failures revealed that hazardous waste siting was handicapped if social criteria were not met. Groups responsible for siting facilities in the 1970's began to acknowledge past failures and incorporate more public participation in their sitings. Subsequently in the 1980's, sitings were increasingly being carried out by utilizing a volunteer approach which looks for a socially acceptable site prior to selecting the most technically suitable site. An example of this new approach will be studied in this thesis.

Goals of the Study

The volunteer siting process is very time consuming and costly, taking years to complete and frequently costing millions of dollars. It would be very helpful if there was a profile of the type of community more amenable to hosting a low-level radioactive waste (LLRW) management facility so that resources could be targeted towards them. This thesis will endeavour to determine if such a profile existed in the siting exercise carried out in Ontario to obtain a host for historic low-level radioactive waste (LLRW), by looking for commonalities among six communities that volunteered to take part and remained in the process for a specific duration. The development of a profile of a potential volunteer community would be a great asset to officials with limited budgets as it would enable them to concentrate their efforts on

communities which may be more likely to agree to host a LLRW management facility.

The second goal was to compare the findings obtained through interviews and documentary evidence to the literature on the siting of hazardous waste facilities to determine which factors were associated with longevity in the siting process.

The third goal of this study was to validate the volunteer siting approach (which has as its cornerstones the principles of voluntariness and control) by looking at the experiences of the six communities which advanced farthest in the siting process, the source communities which were involved throughout the siting process and the Siting Task force and the Siting Task Force Secretariat.

Further goals included the development of data bases on compensation and ethical issues.

Both of these issues have a significant effect on the outcome of the voluntary process and both require further research.

Problem Statement and Research Objectives

This thesis explored several factors that have and some that had not been identified in the literature as contributors to the successful siting of LLRW management facilities. The primary research question was: What community characteristics make it more likely that a community will consider hosting a low-level radioactive waste management facility? The secondary research question was: What issues affect participation in the voluntary siting process?

Hypotheses

More specifically, the study was carried out to determine if a willingness to enter into this siting process to accept a low-level radioactive waste management facility and advancement in the site selection process was linked to demographic variables such as: population, employment level, complexity of local economies, and level of tourism. Additional factors such as familiarity with science and technology, level of association with government, past experience with radioactive waste and waste siting processes and community perceptions and beliefs were also examined. Community impressions (including source communities) of the siting process and recommendations for improvement were also documented. Staff impressions (Siting Task Force Members and Siting Task Force Secretariat Members) were also solicited to get a broader view of the process.

Several hypotheses formed the basis for the cross case analysis and were expected to be rejected. They were:

1. Past experience with radioactive waste has no effect upon the willingness of a community to consider hosting a low-level radioactive waste management facility.
2. High levels of past or present radioactive waste production have no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.

3. Prior experience with waste facility siting has no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.
4. Higher than average levels of unemployment have no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.
5. A high percentage of government related jobs have no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.
6. Community economic complexity (single, dual or multi-industry communities) has no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.
7. High levels of tourism have no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.

8. Previous experience in determining the consequences of high levels of science and technology has no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.
9. Low population levels have no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.
10. Voluntarism has no effect on the willingness of a community to host a low-level radioactive waste management facility.
11. The ability to control the process has no effect on the willingness of a community to host a low-level radioactive waste management facility.
12. The nature of the perception of risk (including health, and safety and environmental concerns) has no effect on the willingness of a community to host a low-level radioactive waste management facility.

It was expected that the proposed research would create a data base that would provide for the future development of a hypotheses concerning the effect of compensation on siting and the role of ethical considerations.

METHOD

SUBJECT SELECTION

The chosen sample consisting of the six communities that survived the longest in this siting exercise was quite appropriate as they were the communities most likely to contribute to a successful siting and because of their experience, they were in a position to provide the most insight. The use of this convenience sample injected a high degree of realism both in terms of the exploratory and descriptive research gathered and the economics and time restraints of the researcher.

The sample chosen for this study was the actual sample resulting from the site selection process carried out by a federal crown corporation to find a site in Ontario to store historic low-level radioactive waste. This waste is primarily situated in the following areas: Port Hope (199,000 cubic meters), Hope Township (492,000 cubic meters), Clarington (11,000 cubic meters) and Port Granby (380,000 cubic meters). During the first stage of this site selection process, a siting task force appointed by the federal government invited Ontario's 850 municipalities to send two representatives each to attend one of eight regional information sessions which were held throughout the province. Municipal officials were then given an opportunity to learn about the Cooperative Siting Process being used by the Siting Task Force

and the need for improved management of historic low-level radioactive waste so they could determine whether to involve their communities in the process (Rennick et al., 1990).

Following these information sessions, twenty-six municipalities invited the Siting Task Force to conduct similar information sessions in their communities. Of these, five communities withdrew their requests before the information sessions were held. The siting task force travelled to the remaining twenty-one municipalities and held information sessions with town councils and members of the public. The Task Force advised the communities that if they wished to continue in the process that their municipal councils should pass a resolution indicating their interest in remaining in the Siting Process. At this point, seven communities of the twenty-one withdrew from the process. Of the remaining fourteen communities, three were source communities (Port Hope, Hope Township and Clarington). The Task Force advised all fourteen interested communities to form Community Liaison Groups whose purpose would be to ensure that all identifiable interests in the community would be represented.

At this point, six communities opted out because they did not have support from either their Community Liaison Group or their town council. That left six communities with either their town council or community liaison group volunteering to continue in the site selection process in addition to the three source communities. In one community (Elliot Lake), the Town Council voted against the Community Liaison Group's recommendation to continue in the process. Conversely, three Town Councils (Deep River, Chalk River and Hornepayne) voted to stay in the process against the wishes of their Community Liaison Groups. The Township of James received approval from its Community Liaison Group but their Town Council never

followed through with a resolution. Only one community gained the approval of both the Community Liaison Group and the Town Council - Geraldton. In order for any community to proceed to the next phase of the siting process, approval of town council was a prerequisite (the community liaison group's wishes could be ignored by town council). This resulted in only four communities continuing to the fourth stage of a five stage siting process (Hornepayne, Geraldton, Chalk River and Deep River). Soon after Chalk River had to withdraw from the process because the town was unable to identify any suitable sites within its municipal boundaries. Geraldton and Hornepayne each carried out an early referendum, which resulted in their town councils withdrawing their support for remaining in the process. Conversely, local government changes led to Port Hope's assumption of a volunteer status

Up until the beginning of August 1995, two communities remained in the process as volunteer host communities - Deep River and Port Hope. In August, 1995, Port Hope passed a resolution to withdraw from the process after a failed attempt at drafting an acceptable project proposal (that is the LLRW technology, facility, site and terms of acceptance). In contrast, a resolution was defined in Deep River, and it became subject to a community referendum and a subsequent decision by council to continue its participation in the Co-operative Siting Process. Finally, the results of a referendum held in Deep River on September 21, 1995 supported advancement in the process.

As a result of Deep River's favourable referendum vote and Council's recommendation, the Siting Task Force is in a position to recommend the project proposal to the federal government for its consideration. The Siting Task Force can advise the federal Minister of Natural Resources whether they feel that the project proposal should be accepted.

Due to practical considerations, the researcher was unable to include all 850 communities in the following study. The six communities that were included, were those who had either their town council or their community liaison group recommend continuing into the fourth stage of the five stage siting process and the three major source communities, including Port Hope who changed its status to volunteer host community late in the siting process. The choice of these communities made sense. Their extended membership in the process meant that they had experienced a greater level of exposure to the voluntary siting process and thus, would be better able to judge the process.

Data Collection and Analysis

Case studies of the six volunteer communities (Elliot Lake, Township of James, Hornepayne, Geraldton, Port Hope, Deep River) which had either their town councils or CLGs in the later stages of the siting process recommend continuation were developed by using two approaches. Firstly, community profiles were developed by reviewing census data, municipal records and consultant's studies and extracting information on population, employment levels, complexity of local economies, tourism levels, levels of government association, familiarity with science and technology and past experience with radioactive waste and waste facility siting. These profiles, based upon the earlier listed propositions, were examined for each community and reported altogether in single chart (detailed transcripts and basic data are available upon request). Communities were compared in order to determine if certain variables seemed to be associated with farther advancement in the siting process. In addition, an evaluation of the

combined effects of two or more variables on the willingness to accept a waste management facility were examined for trends. The small sample size allowed comparisons to be simply made without the need for complicated statistical manipulation. The first page in the results section summarizes this information in chart form with check marks appearing if the characteristic was found.

Secondly, more extensive case studies were developed for each of the volunteer communities. For ease of comparison, they were structured in a manner similar to literature review. They were based in part upon all available community liaison group meetings minutes, public records, media reports, surveys and other public documents such as letters, faxes and Siting Task Force internal communications which were open to the public.

The above information was supported by a series of interviews. Individual interview subjects were selected by consulting the siting task force's records listing community liaison group members. In addition, local politicians (mayors, reeves, and counsellors) and highly involved private citizens were identified by either government records or by carrying out by a semi-rolling procedure (e.g. interviewing one person and obtaining the names of others to interview and so on) (Haines, 1994). In nearly all communities, town mayors and/or reeves and community liaison group chairpersons were interviewed. Interviews were also held with additional community liaison group members, and town counsellors to gain a broader perspective on local opinions.

Interviews were both structured and unstructured. The questions asked in the structured portions of the interviews are outlined in appendix 1 and they related primarily to the

propositions concerning voluntarism, control, risk perception and compensation. The unstructured part of the interviews allowed the candidates to give their overall impressions of the cooperative siting process, their evaluations of community sentiments and make suggestions for improvement of the process. The versatility of the interview was well suited to this research setting. Interviews allowed the researcher to make full use of comments, provide immediate feedback and obtain more in depth information. Furthermore, the one-on-one contact appeared to create a feeling of trust which led to more meaningful information being revealed. The interviews allowed the researcher to expand the research beyond the tested hypotheses and to examine other community characteristics and impressions. Issues relating to the voluntary siting process and its execution provide a more complete impression of why a community entered or exited the process.

Interviews were carried out primarily by telephone and they each lasted approximately forty-five minutes. In Port Hope and Deep River, interviews lasting on average one hour were conducted primarily in person since, at the time that the research was carried out they were the two remaining communities still involved in the process. It was felt the greater detail which the researcher desired on these two communities would be more easily be obtained from face to face interviews. In total, forty-two interviews were carried out over a one year period.

The six case studies are presented in appendixes B, C, D, E, F and G. Key issues and concerns extracted from the case studies are highlighted in a series of charts (patterned after the literature review) in the results section. Whether the information was obtained through documentary evidence and/or interviews is indicated by a letter code under each identified concern.

Meeting minutes and communications between the Siting Task Force and Hope Township and Clarington were reviewed in detail to determine the priorities and concerns of these two source communities. Mini case studies outlining these issues are reported in the results section.

The specific sources (ie. interview or documentary) of information that the cases are based upon are detailed in a separate reference list to avoid confusion with the reference list for the literature review. Each citation is structured so that the town from which the information was gathered is indicated, followed by a lower or upper case letter. Upper case letters identify interview sources and lower case letters identify documentary sources of information

Several interviews were also carried out with members of the STF and the STF Secretariat. The highlights of these interviews are summarized in the results section.

Confidentiality

Some of the information, such as that gathered through the public domain was readily available. The remainder was gathered through the interview process. A small number of interviewees were reluctant to be identified personally so they were given anonymity by assigning them a letter and identifying the town from which the comment came. More detailed information in the form of transcripts is available upon request.

LITERATURE REVIEW

Format

The literature review begins with a description of the history of the evolution of LLRW as this continues to have a direct bearing on how people continue to react to its presence. This section also contains a description of the voluntary siting process so that the reader may understand the siting model that was utilized in this siting. This will enable the reader to better judge the model's effectiveness and whether this siting utilized the model correctly. The middle section of the literature review is organized into segments which deal primarily with the factors affecting the acceptability of a LLRW management project. The final section of the review gives a brief overview of the literature. A glossary precedes the appendices located at the end of the thesis and may be helpful for those unfamiliar with LLRW and hazardous facility sitings.

Low-level Radioactive Waste Siting Background

A large body of knowledge has evolved that offers helpful information in understanding the challenges of waste facility siting and on ways to improve it by encompassing the principles of

voluntariness, controllability and cooperation. For the purposes of this literature review, information will be drawn from many types of waste facility sitings. Low-level radioactive waste facility sitings are subject to many of the same challenges and controversies as others, except that there is an extra level of resistance.

During the last twenty years the approach taken for siting radioactive waste management facilities has evolved from being a technically driven process which began with governments and experts making decisions without public involvement, to a more complex and flexible process that incorporates social, economic and political issues. The original "decide - announce - defend" approach to site selection which failed to consider alternate approaches and the needs of host communities, damaged trust and ignited conflict between proponents and communities. In the end this stalled or stopped siting processes. This type of site selection evoked a "why us?" reaction and erodes the relationship between the local communities and proponents. The resulting adversarial and confrontational relationship frequently resulted with each side staking out extreme positions and selectively choosing facts to support their side (Armour, 1991).

Only rarely would a community's input be obtained and often not until key decisions had been made (Armour, 1991). Key decisions tended to be made by technocrats who had little concern for socioeconomic, psychological and political factors. Those affected were deprived of the opportunity to give input on things like technology options, site evaluation criteria, examination of potential effects, ranking of alternative sites and conclusions as to the preferred sites (McTaggart-Cowan et al., 1987). Many issues such as risk perception, equality, control and trust would often be ignored (Rennick and Hurlen, 1992).

An excellent example of this occurred in the Ontario town of Madoc in 1978, where Atomic Energy Control Limited (AECL) was carrying out preliminary investigations in the area as part of their mandate to find a technically appropriate location to site a high-level radioactive waste depository. When the public discovered this, they organized themselves and demanded a meeting with government officials. The remarkable thing about this meeting was that public opposition was so overwhelming that the turnout at the meeting was double the population of Madoc.

In 1979, as a result of this type of incident, Ontario's Legislature's Select Committee on Ontario Hydro affairs, set out restrictions for field research and reviews which included public hearings prior to site selection. In addition, AECL was required to obtain the approval of the nearest municipal government before conducting any further research in Ontario. AECL subsequently launched an extensive public information program and approvals were obtained from municipal governments for permission to carry out field research (Greber et al., 1994). However, it was not until public participation in the decision making process, and its effect upon the success of siting projects was recognized that significant progress occurred in obtaining public acceptance of the research.

In the mid 1970's, the government appointed two commissions (the Porter Commission and the Bayda Commission), which both included as their mandate a provision for public input into their proposals for dealing with Canada's nuclear fuel waste. However, participation by persons not affiliated with interest groups was negligible. This is not surprising as it is fairly typical that responses are minimal from individuals other than activists or special interest groups (Corner, 1991).

In June 1984, the federal cabinet passed the Environmental Assessment and Review Process Guidelines Order, setting out a detailed assessment process for all "proposals" including "any initiative, undertaking or activity for which the Government of Canada has a decision making responsibility" (Government of Canada, 1984). The guidelines required proponents to take environmental matters into account throughout the planning and implementation of new projects, and to carry out screening for all projects that may have an adverse affect on the environment before any commitments or irrevocable decisions were made (Franklin, 1991). Projects that could significantly affect the environment would undergo a formal review including public hearings. The Federal Environmental Assessment Review Office would then use the conclusions of these assessments to plan and implement projects. There was also an Order-In-Council passed which required that directly related social impacts would have to be considered when determining the feasibility of projects (Greber et al., 1994).

The composition of review panels changed so that all members except the Chair would be drawn from outside the federal government. The Executive Chair of the Federal Environmental Assessment and Review Office or his designate would chair each panel. A couple of years later, it was interpreted that the panel chairman could also come from outside the government (Greber et al., 1994).

Canada's Low-Level Radioactive Waste Management Office was established in 1982 to resolve historic waste problems that are a federal responsibility, and to ensure that a user-pay service was established for the disposal of low-level radioactive waste produced on an on-going basis. Another mandate was to address public information needs about low-level radioactive waste (Franklin, 1981). This office is operated by AECL Research through an

agreement with Natural Resources Canada which is the federal department which establishes national policy. The low-level office contracts projects to private sector contractors and consultants, and to other divisions of AECL research.

In 1986, after several conflict-ridden attempts to site a low-level radioactive waste facility in Ontario, the federal government established an independent task force to advise it on how to proceed to site a new facility in a new non-confrontational way (Armour 1991, Rennick et al., 1990). The task force proceeded by conducting cross-Canada consultations with individual citizens, community groups, proponents and municipal officials who had been involved in or affected by facility siting efforts, to find out what they thought should be done to improve the process. Several key findings were made. They were that: community consultation is usually too little too late; the criteria used to select sites do not always reflect the values of the community stakeholders; control of decision making is vested with a limited group of stakeholders, namely the proponent and government regulators (the latter who were often described as "too close" to proponents to be unbiased); there is no effective mechanism for obtaining intervenor funding; there is a lack of trust between parties involved, and federal policy falls short of addressing issues of waste reduction, research and development to improve the safety of nuclear energy generation and waste management, and energy substitution (Armour, 1992).

The communities response to the question "what are the key elements of an acceptable siting process?" was that they should have the power to decide whether or not to accept a proposed facility and if so, they should play an active role in decision making, including site monitoring. Some expressed a desire that the proponent should be removed from the siting

process and an independent group given responsibility to implement the process. Others felt that the acceptable process would be collaborative and whoever was to implement the process must not be authoritarian and paternalistic. The views of non-experts must be considered legitimate and the proponent must be willing to adopt a partnership relationship with the community. All stakeholders should be provided with adequate resources such that they can participate effectively. The communities also felt that they should be entitled to a net benefits package which detailed the limits on compensation and benefits from the outset (Armour, 1992).

One year later, the siting task force recommended that the government implement a five phase siting process called the Cooperative Siting Process, which was based on voluntary participation of local communities in a collaborative, joint-decision making manner (McTaggart-Cowen et al, 1990). The first three phases of the Cooperative Process focused on establishing guidelines, holding regional information sessions and informing interested parties about the low-level radioactive waste management problem and the siting process. Phase three included extensive community consultation after which communities were asked to decide if they were willing to progress into the next phase which included a detailed site investigation and project assessment in their municipality. Communities were only officially asked whether they would be willing to host a facility after phase four. This phase included a full public review of the technology and environmental factors and the development of an impact management and benefits package after which local residents were asked to express their opinions in a referendum. During phase five, if a volunteer still remains, the process will move from cabinet approval through to the establishment of a Board of Directors to undertake the design, construction and operation of a facility.

The task force identified five principles to guide the siting process in response to the concerns brought forth during the public consultation process. They included an endorsement of the principles of voluntarism and control, joint decision making and problem solving, mitigation and compensation, free choice and protection of the environment and human health (Armour, 1991).

Environmental Suitability

Meeting the environmental suitability requirement is a prerequisite for becoming a host for a waste management facility. To determine the suitability of potential host communities, characterization of tracts of land must be undertaken. This entails investigations to determine the physical, chemical and biological conditions in conjunction with the socioeconomic and health conditions of the potential host communities (Greber et al., 1994). The overall scope of characterization is determined jointly with potentially affected communities. Economic factors such as transportation distance and utility infrastructure may be important and the community is the best source of this type of information.

The narrowing of locational options at each step in the siting process is based on either a decision of a community to withdraw or the application of some exclusionary criteria. Exclusion criteria are used to block the participation of communities because they either have some undesirable characteristic or lack a necessary one.

From the onset, the definition of the host community and the corridor communities and their

roles require clarification. The input of corridor communities is needed to identify all possible transportation routes, traffic volumes, historical accident rates and locations, population and property distribution and sensitive recreational, religious, cultural and environmental areas. Municipal by-laws concerning waste transportation must also be considered.

Environmental and socioeconomic assessment studies for site selection involve the comparative evaluation of alternative sites to identify a preferred site where the effects might reasonably be expected to be minimal (Greber et al., 1994). This can be a very expensive process.

However, so few communities make it this far in the process that normally only a small number of sites require evaluation. In the assessment process, extensive consultation with potential host communities is required to obtain input on the factors considered important in the evaluation, the magnitude of effects identified, their importance to potential host communities, and how these potential effects would be developed (Greber et al., 1994). Moreover, at this time, provisions for the management of effects (plans to compensate or mitigate adverse affects or enhance benefits) are decided.

The Opposition Forces

The two major forces in opposition to radioactive waste facilities are the anti-nuclear movement and the Not-In-My-Backyard (NIMBY) advocates. In most cases, the nuclear industry is seen as the proponent and the anti-nuclear and the NIMBY groups are seen as the opponents.

Overall, about one-fifth of the Canadian population is strongly opposed to the use of nuclear energy (Angus Reid Group, 1993a.). This may be in part related to the way that people view risk in general and/or it may also be that people who hold this view have a different perception of the nuclear waste management issue than those who support the use of nuclear energy or do not hold strong views on its use (IPPANI, 1985). This may be in part because of the way that the nuclear industry developed. Nuclear fission was developed secretly and when it was finally brought to the public's attention during the second world war, it was in the form of weapons. In addition, the bulk of the wastes generated by military nuclear enterprise frequently were not sequestered in what would be regarded as a properly designed depository.

The first individuals to join the anti-nuclear movement were the left-overs from the ban-the-bomb protests of the 1950s (Sims, 1990). These people were later joined by those who were concerned that the possession of nuclear power reactors would lead to the development of more nuclear weapons. In the late 1970's and early 1980's the introduction of cruise missiles and the strategic defence initiative created more anti-nuclear proponents who in turn joined many who had evolved from the early "environmentalist movement". These people questioned the direction society was taking and for them, nuclear power represented all of the things that they opposed (Weart, 1988). A third anti-nuclear group were individuals who were generally anti-technology (Sims, 1990). This group, often referred to as communalists, yearned to return to a simpler lifestyle. For them, the large scale generation of energy is a paradigm for all that is wrong with modern society (Sims, 1990). This frequently well-educated and influential group of people are questioning science and materialism itself from their own position of economic security. Unfortunately for this group of people, there were very few mechanisms for the public to question government decisions. The lack of arenas for public debate together

with the initial culture of secrecy around nuclear energy, set the stage for an adversarial relationship and has left a legacy of mistrust such that environmental disasters, even those unrelated to the nuclear industry, continue to fuel public mistrust of technology and further promote the adversarial relationship (IPPANI, 1985).

Some who are opposed to nuclear energy as a power source are fearful that finding a solution to the nuclear waste management problem would provide impetus for further development of nuclear power (Greber et al., 1994). The primary concerns include the association between nuclear energy and weapons and a concern on how to manage radioactive waste and the potential for accidents (IAEA, 1992). In many countries, concern over safety and the environment has halted the advancement of the use of nuclear power as an energy source. In Canada, no new nuclear facilities will be commissioned before 2025 (LLRWMO, 1992). As the previous discussion illustrates, there is a need to look at the root causes of the public's opposition to all things nuclear. A knee jerk reaction on the part of the government decision makers blaming the anti-nuclear movement does not make sense. The success of the anti-nuclear movement is merely a reaction to the public's deep seated fears. It is important to broaden the discussion beyond opponents and proponents of nuclear technologies to involve a broad cross section of Canadian society and forge a Canadian consensus concerning a socially acceptable method of handling radioactive waste.

In most cases, two major groups may be involved in a site selection process. First, there is the community or communities who are interested in getting rid of their waste and do not wish to take care of it on their own. The second group is the community which is willing to host the waste management facility. The interests of both are very different. The former is concerned

with getting rid of its waste, preferably not in its own backyard, while the latter is concerned with equity, control, environmental effects and compensation (Armour, 1992). A third potential group may be a combination of the previous two; a community who is willing to host its own waste. The primary interest of this group would be to find a safe solution to its waste problem. A fourth group warranting special consideration includes those residents who live immediately around the facility site and are thus, most impacted by its construction, operation and postclosure.

Low-level radioactive waste siting exercises are subject to the NIMBY phenomenon (Not-In-My-Backyard), which means that local communities may or may not be opposed to a facility per se but, they certainly do not want it in their immediate vicinity. Armour (1990) suggests that the NIMBY syndrome arose from a population who felt betrayed, starved of information and ineffectual in decision making. Kasperson et al., (1992) suggests that the NIMBY problem is due to a lack of confidence by the general public in scientists' ability to diagnose the relevant risks accurately. Furthermore, the forecasting literature which shows experts as being without fail unable to forecast accurately adds scientific credence to this commonsense belief (Armstrong, 1985).

Armour (1990) provides three reasons for adverse reactions. First, she says that personality traits, attitudes and perceptions along with socioeconomic characteristics, explain the degree to which a community will react negatively to a siting proposal. Various social factors, societal trends (ie. declining faith in governments and institutions) and increased public concern over health and lifestyle issues may also account for a NIMBY reaction. Public Consultation Programs used to obtain input into Canada's high-level nuclear waste project revealed that the

public believes that there may be health risks (ie. cancer risks) for people living in the vicinity of a disposal facility and for those along the transportation corridor servicing the facility (FEARO, 1990). Finally, the facility itself may be deemed as a locally undesirable land use because of potential negative impacts and the perceived unfair distribution of costs and benefits of the facility.

A national survey carried out in the UK found that as many as seventy-nine percent said that they would move if a nuclear repository were built in their area; sixty-six percent would move if it were a nuclear power station. This compares with only fifty-one percent for an airport and thirty percent for a motorway (Lee et al., 1985). In the case of radioactive waste facilities and nuclear power stations, the percentage who said that they would move away is closely matched to the percentage who said that they would take up active protest. In the case of all other major impacts, there are a substantial number who claim that they would move away but for whom direct action would apparently not be considered (Lee et al., 1985). This demonstrates the intensity of feeling that radioactivity evokes. Survey respondents were also asked about their fear that "...anything could go seriously wrong" at a shallow surface engineered site for low-level radioactive waste. As many as twenty-two percent of the population consider this to be likely or very likely and sixty percent "possible" within five years and forty-six percent likely in fifty years (Lee et al., 1985).

Although a NIMBY and/or anti-nuclear stance are certainly partial explanations for the negative reactions of many communities towards siting, it would be an oversimplification to say that they are the only reasons. For most people, the home is not only their shelter and expression of their personality - it enshrines most of their savings. In owning a home, they

appropriate a neighbourhood as well as a house and their quality of life; the security of their investment depends upon preserving both. For some, a NIMBY response is insufficient. Going beyond NIMBY, we now have BANANA, "Build Absolutely Nothing Anywhere Near Anyone" (Lee, 1993).

The following discussion will further demonstrate that low-level waste management facility siting is a very complex process involving a large number of factors, many of which are tied to a person's emotional and psychological makeup and past experiences. Most negative reactions to radioactive waste facility siting are best studied by looking at the way that people perceive risk. Understanding and combatting risk perception issues paves the smoothest road towards eliminating the NIMBY response.

Public Perception of Risk

Public concern about the impact of industrial and technological development on the environment and upon quality of life has never been greater, as indicated by the increased importance given to environmental issues in national public opinion polls (Angus Reid, 1993 a). Canadians, even more than their American counterparts have a sense of urgency with respect to environmental problems and say they are more willing to make personal sacrifices and support tougher environmental legislation (Angus Reid Group, 1991).

When Canadians were asked to list the most important environmental issues facing them,

nuclear power and waste were indicated only two percent level of the time (Angus Reid Group, 1992a). Similar findings were obtained through surveys conducted for the Canadian Nuclear Association and Ontario Hydro (Decima Research 1987, 1988, Goldfarb Consultants 1986). However, when Canadians are presented with a list of environmental or health issues which includes nuclear waste, they rate it as a very high concern (Goldfarb Consultants 1986, Slovic et al., 1993). This is most likely because of the great many risk related issues involved in this environmental problem.

Perhaps the greatest opposition to radioactive waste is the public's perception of risk which varies greatly from the experts. Those who generate and manage risk, perceive it differently than those who experience it. The technical and scientific community are primarily concerned with the probability and likely consequences of an accident. These consequences are measured quantitatively in terms of expected losses (Fischhoff, 1985, Covello, 1993). For scientists, a willingness to accept a risk is a matter of the trade-offs between expected losses and expected benefits. This definition is regarded with suspicion by the general public who perceives risk more by anticipated or feared consequences than their probability (McTaggart-Cowan et al., 1990).

Radioactive waste conjures up all the fears associated with toxic waste but to a greater degree because of its supposedly "invisible, unknown nature." Public concerns over low-level radioactive wastes are more often than not based on perceived threats to humankind or the environment rather than real threats (Greber et al., 1994, McTaggart-Cowan et al., 1991). These perceptions are compounded by moral, cultural, social, political and above all emotional considerations; they are at once more extensive, multi-dimensional and dynamic (Lee, 1993).

According to Hall (1989), the radiation hazards to human health posed by low-level radioactive waste are trivial compared with medical radiation, which in turn is dwarfed by the potential effects of radon. He also contends that people who live close to a nuclear power plant or to a burial site for radioactive waste, usually receive far more radiation from the normal radon exposure in their homes in one day than they would receive in a year from a power plant or burial site neighbour. However, convincing the public who have frequently been deceived, is not an easy task. Consequently, it is not surprising that the United States' government is estimated to be spending about \$200 million dollars per eventual life saved to protect future Americans against radiation from nuclear waste and requiring utilities to spend \$2 billion per life saved to protect the public from radiation from reactor accidents. By contrast the estimate is \$10,000 to save a life by reducing radon levels (Cohen, 1985).

Low-level radioactive waste is frequently perceived as being more dangerous than it really is because most people, regardless of their education level do not make a distinction between different kinds of radiation or between different levels of radiation. In fact, most Canadians, whether they are well educated or not, know very little, if anything at all about radiation (CAIRS, undated). The subject is not part of the school curriculum and it is barely touched upon in our universities, except for certain specialized areas of study. Canadians do not possess even the rudiments of a general knowledge about radiation that would assist them in beginning to assess the pros and cons of these technologies for themselves. That omission is remarkable when one considers the billions of tax dollars and private investment that have been spent in making Canada one of the world's leaders in medical and industrial technologies involving radiation.

Learning about anything depends on the motivation of the person. It is very difficult therefore, to explain risk to those who do not want to know or who have already made their minds up. Many people prefer not to invest time in things that may not come to pass and therefore, only become interested when the site is announced and then it is too late to get people involved. People who are not emotionally drawn to an issue tend to pay relatively little attention to information. Like the apathy-denial continuum, emotional arousal is a U-curve (CAIRS, undated). The optimal level is somewhere between boredom and short-circuited paralysis. It is therefore important to find ways to address public emotion. Unfortunately, many of the common sources of risk information come from people who are unaccustomed to dealing with emotion on a professional level.

When we think about resolving issues we think about relevant instances of the problem in question by sampling our knowledge for available information. This information may be anchored on some useful accurate information or else it could be based on falsehood. As a result, the final conclusion may be a biased assessment of all available information. When a person holds a particular belief - evidence coming in against the initial judgement will adjust the belief from that initial judgment rather than simply being added into the process (Spears et al., 1985). In addition, risk judgements are made in part by assessing how much a situation resembles others of which there is a prior understanding (Spears et al., 1985). Spears et al., (1985) found that illusory correlations are most likely to occur when the events are congruent with one's own views. Therefore, exaggerated fears about radiation will continue to perpetuate themselves.

The public frequently does not understand complex technical evidence and is certainly not

persuaded by it. It also seems clear that further major educational efforts, whether directed to the general population or to groups specifically threatened by radiation risks, will not necessarily alter the existing negative perceptions (McTaggart-Cowen, 1991). However, the public has expressed a desire for more research on radiation effects on public health and the natural environment (Greber and Anderson, 1989), in spite of the fact that additional research and technical information appear to do little to alleviate the fear of radiation (Greber et al., 1994). It is entirely possible, indeed likely, that increased information, rather than acting as an agent of change serves primarily to confirm rather than shape attitudes and that individuals selectively fit new information to existing belief structures. Psychologists have pointed out that more information to eradicate the "perception gap" may mobilize latent fears about technology and actually increase concern (Greber et al., 1994). For instance, as more has been learned of health effects resulting in cancer and leukaemia in workers, standards for allowable radiation doses were lowered.

Using risk comparisons tends not to be successful when the source is considered unbiased and the issue is emotional (Sandman, 1986). Other factors in addition to relative risk must be considered and therefore, the comparison must not be used to promote or dismiss the issue, but, rather for clarification purposes.

The comments of a Canadian environmentalist speaking out against the Ontario Government's provincial hazardous waste management site in the Niagara region encapsulates the problem: "We, the recipients of risk communications have little faith in what we are told. We feel misled, manipulated and insulted by risk assessments and by those who convey risk assessments. The implied put-down of the public in the differentiation between "assessed" and

"perceived" risks infuriates the public (Jackson, 1989). The public also resents comparisons of risks associated with waste management siting to everyday risk "activities" such as driving a car (Resource Futures International, 1992).

All too often, experts prefer to avoid explaining risk issues to nonexperts and thus, are generally inexperienced at communicating in an approach appropriate for public audiences. Frequently the communicators of risk information are people who are professionally trained to ignore emotion (Sandman, 1986). This of course backfires and causes the public to protest all the louder and listen less which then makes the experts even less comfortable and creates a vicious cycle of poor communication.

Many experts cannot communicate their knowledge as they are unable to simplify their information. It is essential to simplify risk by communicating to the public what they ought to know in plain language. It is easy to assert that experts should give the public the information they require in order to understand the information or put it into context, but very difficult to achieve such a goal in practice. Also enough qualifiers and structural guidelines must be provided to prepare people for what they are not being told, so that additional information later on will not leave them feeling unprepared and misled.

Some experts may be nervous about talking to the public because they may also fear saying something incorrect or being misquoted by the media or misunderstood by the public. Others may believe that the effort of communicating in lay language is not worthwhile. There is little value attached to writing for the general public and in fact it may be viewed as professionally damaging (Sandman, 1986). Virtually all technical professions punish their members for

popular communication (Sandman, 1986). Successful technical communication should simplify complex issues and this runs the risk of diminishing the status of the communicator's profession. For example, the use of jargon is sometimes a sign of the status difference between the professional and everyone else. There is always the question of, if the public understands, will they be willing to pay for the expertise and respect it as much. However, risk communicators must be aware that technical language and jargon can create a perception that the official is being unresponsive and evasive.

Trying to persuade, convince or somehow turn around the opinions of community members can sometimes even backfire if the proponent is unable to tread the fine line between manipulating public opinion and liberating it (Connell, 1991). Using communication and education as a way of trying to change people's attitudes and beliefs (especially regarding risk) and ultimately encouraging different behaviours has not been very successful (Connell, 1991). In fact, there is often very little difference in knowledge between pro- and anti-camps (Curd, 1988). Unfortunately, the nuclear industry as a whole still appears to believe that opposition is founded on ignorance and if enough information can be given to people they will not fear all things nuclear. Information has a role but it is a supportive role. It is not a ram that will batter down the walls of ignorance and allow matters to proceed logically (Curd, 1988). Whatever the problems, it is clear that an open information policy which treats people as having genuine concerns and fears rather than as subjects of an educational program is very important.

Another problem occurs when public acceptability of siting processes is seen as separate and distinct from the legitimization of the process used to make it, when in fact the two are

intricately bound together (Connell, 1991). People will be suspicious of a decision if they have reservations about the process that was used to make the decision. Therefore, the fundamental issue is not how to persuade the public to accept a facility but rather how to structure the process of arriving at publicly accepted decisions (Connell, 1991).

Over the past twenty years a substantial body of literature has been established on the causes of these differences. The overall conclusion of the literature on the social and cultural construction of risk is that it is not an objective phenomenon perceived in the same way by all interested parties. Instead, it is a psychological and social construct with its roots deeply embedded in the workings of the human mind and in a specific social context (Greber et al., 1994).

Some factors that are significant in easing people's perceptions of risk are demonstrable safety records, the rediscovery of the benefits of a particular technology, and the degree of commitment to fairness and equity in making decisions and managing technology (Kasperson, 1990).

Accidents in one country reverberate strongly in others. People often perceive accidents as signals. A minor accident in an unfamiliar system, such as a leak at a low-level radioactive waste facility can have major significance as a harbinger of future and possibly catastrophic events (Covello, 1989). Moreover, risks are sometimes minimized or maximized in order to satisfy political, social and economic agendas.

The way in which our legal system deals with polluters contributes to the fear that people feel

about accidents. The public is quite aware that if health or environmental hazards occurred in their area as a result of a waste facility, that the onus would be on them to prove damage (Osborne, 1989). Osborne (1989) maintains that we have to stop using this outdated paradigm and that the onus should be put back onto the shoulders of the polluter to prove innocence if the public has been properly informed.

As already mentioned an extended period of major accident-free operation of a technology and/or a successful handling of risk events is a clear need for any controversial technology, an opportunity already at least partially lost for both nuclear power and radioactive waste management. Further serious accidents add to the problem.

History has demonstrated the futility of a technocratic approach. Technical types would be wise to remember that the public's minimal scientific, engineering or statistical knowledge, does not make them any less of a political force. In this situation there is a need for both "mind sets" to be taken into account by risk assessors and communicators who are earnestly applying themselves to new ways of negotiating and conciliating between the various stakeholders.

Frustrated engineers accuse the public of wanting to have their cake and eating it too as they perceive the public as wanting the benefits of technology without the costs (Lee, 1993). Most professionals believe that public policy would be soundest if it were left in professional hands (Sandman, 1986). Ultimately, knowledge is power and the impulse to share knowledge depends on a willingness to share power.

From the outset it is important to empathize and acknowledge people's fears before trying to explain risk on a factual level. Many are reluctant to do this because of their professional focus and the extra time that it consumes. Environmental risk assessment is based primarily on estimates and this lack of precise answers is what worries the public and scientists alike. There is also concern that the technical formula of risk perception needs embellishment to include socioeconomic factors such as personal rights, protection of property values, lifestyle and psychological well-being if the risk perception gap between scientists and the general public is to be bridged. Even amongst community members, group dynamics can tilt along a technical/non-technical axis (Kusterer, 1993). Developing a plan to deal with the socioeconomic and cultural factors is a very important component of the siting process (Grondin et al., 1994). These factors need to be accounted for and addressed when siting waste treatment facilities.

Universally, to all but the experts (and even to the experts when they go home at night), risk means more than just mortality (Sandman, 1986). In fact, environmental risk is often viewed as more of a moral issue than a health and safety issue. For the most part, the developed world has reached near-consensus that pollution is morally wrong - not just harmful or dangerous, not just worth preventing where practical, but wrong (Sandman, 1986).

Doob (1987) found that people seem to be less influenced by systematic, scientific, or statistical information than they are by stories about single incidents. It seems that most people are not good at limiting themselves to the most relevant data. It also appears that most people are not good at ignoring irrelevant information even if, cognitively, they might agree that the information is irrelevant. Worse still is the phenomenon that inferences are often

driven, inappropriately, by the effects of vivid information. This information seems to overwhelm other, less sensational information such as the presentation of statistical information which has a tendency to be dull and undramatic. The problem of a single vivid case being more influential than other information has direct relevance to the way in which people perceive risk. A good story has powerful effects.

Covello (1989) found that people often have difficulty understanding, appreciating, and interpreting small probabilities. Therefore, the fact that the regulations set forth by the Atomic Energy Control Board (AECB) on radioactive waste specify that the increased risk to members of critical groups (ie. those handling the waste or around the site) must not exceed "one chance in a million per year of serious health effects, for at least 10,000 years into the future " is unimaginable to most people and therefore more attention is given to the one chance than the probability of that chance (Greber, 1994).

People often respond emotionally to risk information, especially if the risk is perceived to be involuntary, unfair, not under their personal control and low in benefits. A marked aversion to uncertainty is also common. This aversion is often displayed through a noticeable preference for statements of fact over statements of probability which is the language of risk assessment (Covello, 1994). People also tend to ignore information which is contrary to their own beliefs and therefore, beliefs tend to change very slowly in the face of contrary evidence. In contrast, beliefs and opinions are easily manipulated by the way information is presented when the beliefs are weakly held (Covello, 1994).

To alleviate public fear it is helpful to encourage the public to rediscover the advantages that

nuclear energy can contribute to society, rather than explaining technical risk assessment. After a series of television advertisements explaining some of the benefits of nuclear technology were shown in the Ottawa/Carleton area, it was not uncommon to hear people commenting on the fact that nuclear energy was important because it was needed in the production of smoke detectors!

Lind et al. (1991) postulates that there is a need for a national framework for the management of risk to prevent the waste of scarce resources on inefficient waste reduction schemes. They recommend that the public's risk perception should be disregarded since it may consume resources beyond diminished returns to reduce risks. "Real lives not perceived ones" are said to be the concern. At the opposite pole are those who believe that statistics do not alone justify a risk, rather risk should be communicated in terms of community values. This conflict will only be resolved when scientists are able to accept that for the majority, risk perception is not an objective concept. This will be difficult because experts receive confirmation of their point of view when their perceptions are validated by factual data. For example, when experts estimate risk, their responses correlate highly with technical estimates of annual fatalities (Slovic 1987). However, there is an urgent need to bridge the gap between the scientists and the public so that communities will feel comfortable volunteering for these facilities.

Ultimately no project of a controversial nature will proceed without long-term political support. Politicians typically are shortsighted as they never know how long their stay in office will be. Therefore, they require immediate benefits that they can show to their constituents and say: "look what I did". To obtain and maintain political support requires some insight into the processes which lead to public and political perceptions, coupled with some input into

the opinion forming process.

Most involved in siting readily agree that past methods of dispelling the fear of radioactive waste are ineffective. Fortunately, research on risk perception has identified several factors which influence people's perception of health and environmental risks. They are volition, controllability, familiarity (personal experiences), reversibility, equity and fairness, benefits, personal stake, personal values, victim identity, media attention, scientific uncertainty, accident history, origin, effects on children and future generations, trust in government and institutions and dread (Slovic et al., 1980). Addressing some of these interrelated factors often leads to the satisfaction of many other factors and ignoring them will ensure failure of the siting process.

Radiological Risk Characteristics

Many people consider the risks associated with nuclear waste disposal to be exceptional, and that it is inappropriate to compare these risks to other "well-known" risks. Radiation is seen by the public to be a unique hazard conjuring up fear and dread (Greber et al., 1994). The risks posed by ionizing radiation to human health and the environment have been more extensively studied over a long period than any other toxic agent including PCB's, dioxins and DDT (McTaggart-Cowen, 1991). Some of these studies looked at people who had been exposed without informed consent. There remains a great deal of uncertainty about the effects of low levels of exposure such as those that exist around radioactive waste sites (Houk, 1988).

One researcher suggests that the classification of nuclear waste as unique is because of the

radiological nature of the waste (Foster, 1985). Foster postulates that people are unclear as to the comparative nature of risks associated with nuclear and chemical wastes, but they are quite convinced that there is a difference. One factor is that nuclear waste is believed by the public to present a more severe danger long term while chemical wastes are seen to create more immediate problems, although in actuality they may cause more prolonged problems because of their permanence. The public also places importance on assessing radiological effects not only on human populations, but also on other components of the ecosystem (FEARO, 1990a).

The public's deep seated fear of radiation has been described as a phobia similar to the fear of spiders and snakes (Dupont 1980) or a fear of the unknown (Blowers et al., 1991). In any case the presence of this invisible force appears to cause fear and dread. The public's view of nuclear waste as being uniquely hazardous and tricky to handle is seen to be absolute rather than relative. There is a view based perhaps on past experience that unknown catastrophic events are inevitable (Foster, 1985). The risks are not compared to more commonplace risks but rather they seem to occupy a position of pure dread.

In a study commissioned by Health and Welfare Canada to test Canadian's perceptions of health risks, nuclear waste was ranked as the eleventh highest risk (out of thirty-eight suggested responses), with half the respondents ranking it as "high risk" (Slovic et al., 1993). This rating turned out to be equal to Canadian's perceptions of the risks from car accidents, which killed thousands during the year under study while there is no evidence that a nuclear waste killed anyone. Amazingly, nuclear waste received more "high risk" responses than any other choice when the question was put forward as "considering the health risk to you and your family" (forty percent) (Slovic et al., 1993).

Erikson (1990) tries to explain the view that radioactive substances conjure up pure dread by noting its two distinguishing characteristics. Firstly, radioactivity is unbounded and difficult to frame because of its invisible nature. Most disasters start with a traumatic event, followed by a period of destruction and concluding with an exhausted close. Radiological disasters may or may not have distinct beginnings and some begin years before anyone realizes. Invisible contaminants remain part of the surroundings and are absorbed by the environment eventually and they end up in body tissues and worst of all, genetic tissue. The feeling of uncertainty and the lack of a distinct "danger is over" ending adds to the fear and foreboding. The fear of repercussions can last for months, years and even generations. People feel that they have been contaminated in some deep and lasting way (Erikson, 1990). Pieroni (1986) found that members of a focus group for siting a high level nuclear disposal site were afraid of illnesses and genetic defects that may not manifest themselves until much later. It is also useful to keep in mind the history of the United States' government publicly denying any problems at all, then a generation or more later admitting that nuclear accidents had occurred.

The second characteristic of radiation which also applies to most other toxic substances is that they are without form (Erikson, 1990). This makes them ghostlike and terrifying. Moreover, they reverse the process by which most disasters inflict harm. They do not charge in from the outside and strike like a bolt of lightning; rather, they slip in without warning, and generally do no immediate danger so far as one can tell. They begin their deadly work from within - the very embodiment, it would seem, of "stealth and treachery" (Erikson, 1990).

The Siting Task Force for Low-Level radioactive waste determined that public perceptions are complicated by the confusion of two fundamental principles of radio-biological and radiation

protection theory. The first is the "no threshold" hypothesis and the second is the "as low as reasonably achievable", or the ALARA principle (McTaggart-Cowen et al., 1991).

The first says that there is no threshold below which exposure to radiation is entirely safe. This principle cannot be proven and the effects of low-level radiation are determined through extrapolation of high-level exposures instead of being directly measured. At low radiation exposures (ie. can include common medical diagnostic procedures), any harmful affects are lost in the overwhelming statistical noise that arises. The problem is that the "no threshold" hypothesis tends to over-sensitize the public to the hazards of radiation and make them think that radiation, having no proven minimum safe level, is uniquely harmful and far worse than other toxins. What this ignores of course, is that everyone is constantly exposed to various levels of naturally occurring background radiation

The ALARA principle causes distress because of the differing interpretations of what is "reasonable". ALARA may be used in conjunction with the threshold principle to insist on decreasing radiation exposure for its own sake well past the amount needed to be able to measure benefits. On the other extreme, the International Commission on Radiological Protection believes that social and economic factors must be taken into consideration when deciding what radiation exposure is reasonably achievable (International Commission on Radiological Protection, 1985). This suggests the possibility that safety could be compromised in deference to cost considerations. It is no wonder that the public finds it difficult to know who to trust and what to believe.

Some of the public's fear also stems from the evolving awareness of the health risks of low

level radiation which has resulted in ever increasing lower regulatory dose limits. However, scientists agree that if the risk from radiation was double the present estimate, there would still not be any appreciable effects on human health (Cohen, 1980).

Concern increases when activities are considered to have potentially irreversible adverse side effects (e.g. radiation causing cancer) (Greber et al., 1994). This comes up time and time again with radioactive waste. People feel that it is better to be safe than sorry. The public also worries that scientific estimates may be wrong and revision in the future may lead to less desirable circumstances (Greber et al., 1994).

A primary concern is a fear of cancer from the effects of radiation (Greber et al., 1994). Discussions during a Public Consultation carried out by AECL for a high-level radioactive fuel waste depository, revealed that some people believe there are no safe levels of radiation, and a concern that there is already an increasing level of exposure to, and hazard associated with, low levels of radiation. Some groups believe that the nuclear industry underestimates the health effects of low-level radiation, and fear that a nuclear fuel waste disposal site will be a source of low level contamination posing a health hazard to neighbouring communities (Greber and Anderson, 1989).

Greber and Anderson (1989) propose that psychological impacts should be considered as part of a siting process. They suggest that providing the relevant amount of information to the community members about the facility and the safety standards would help reduce fear of the unknown and could reduce health and psychological stress concerns. The provision of support services such as knowledgeable health professionals and the establishment of emergency and

evacuation procedures would provide an additional layer of comfort and stress alleviation.

People naturally tend to be more concerned about those risks in which they have a personal stake (ie. will affect those they care about). People also tend to be more concerned about risks to identifiable victims (ie. a missing child in Ontario) than risks to statistical victims (ie. thousands of missing children in Rwanda) (Slovic et al., 1980, van der Plight, 1985, Covello, 1983).

Risks tend to be inflated or deflated according to the social, cultural and moral context of the activity (Slovic et al., 1980). For example, Canada places a great value on children and therefore, it is not surprising that people are more concerned about activities that put children specifically at risks (ie. smoking by pregnant women is more taboo than smoking by non-pregnant women). There is also more concern about risks which can hurt following generations. This, like the concern for risks affecting children, is an example of distributional equality which is frequently guided by a moral concern for those who do not have a say in decisions that could affect them (Kunreuther et al., 1989).

Familiarity with an issue tends to make people feel more comfortable. For example, a common household product such as non-stick cooking spray which warns of inhalation being fatal, appears a lot less risky than a high-tech radioactive waste treatment facility as the former is familiar and under one's control, while the latter is extraordinary and controlled by others. It has also been found that people in areas with higher than average levels of radon due to manmade causes demand government action far sooner than those in areas where high levels of radon are naturally occurring. For example, only five per cent of North New Jersey

homeowners arranged to have their homes monitored for radon despite thirty per cent of the homes in northern New Jersey having enough naturally occurring radon seeping into their basements to pose more than a one-in-one-hundred risk of lung cancer (Sandman, 1986). In contrast, the community of Montclair with a landfill site which had incorporated radioactive industrial wastes with radon readings no higher than many homes on natural hotspots, was so fearful and outraged that they successfully demanded that the government spend hundreds of thousands of dollars per home to clean up the landfill site (Sandman, 1986).

In Northern New Jersey, the most crucial factor affecting whether homeowners decided to take remedial action was whether they thought that the resale value of their homes would be affected and whether through comparison that they have found others nearby who have had lower monitored readings (Sandman, 1986).

It has also been found that employees of, and residents near a nuclear power station (and associated nuclear waste storage sites) are not as fearful of them as people who live farther away and have less personal experience with them (Greber et al., 1994). Curd (1988) also found that people who had an association with the nuclear industry and worked at nuclear plants did not suffer from exaggerated fears (Curd, 1988). Another study found power station visits to be one of the most effective ways of inducing attitude change towards a pro-nuclear stance (Lee, 1993). When the Quebec government set up a program to treat and dispose of an inventory of PCBs, they found that the community that had already been designated as a trial site had a much better understanding of the criteria and the process and they were more positive (Ghanime et al., 1993).

In 1979, the Township of Ignace, Ontario, acting on a supportive response to a poll of its citizens on their attitudes towards "test drilling for suitable rock for future waste storage vaults" for high level radioactive waste, invited AECL to investigate a nearby rock formation (Greber et al., 1994). By early 1980, a survey showed fifty-eight percent of residents in the uranium mining community at Elliot Lake in favour of being considered for a waste disposal site (Barrados et al., 1979). This increasing familiarity with nuclear technology appears to reduce the community's perception of risk.

People tend to worry less about risks caused by acts of God (ie. earthquakes and tornados) than those caused by human hands (ie. radioactive spill) (Greber et al., 1994, Erikson, 1990). Natural disasters are almost always experienced as acts of God or nature visiting from afar. Technological disasters, being of human manufacture, are at least in principle preventable, so there is always a story to tell about them, always a moral to draw, and always a share of blame to assign (Erikson, 1990). They provoke outrage rather than acceptance or resignation. They move people to a feeling that this should never have happened and that those afflicted deserve compensation.

People are more concerned about technologies that have had an accident history (Covello, 1983, van der Plight, 1985). People perceive accidents (e.g. such as Three Mile Island) as indicators that they should be concerned about a certain risk. A minor accident in an unfamiliar system has a major social significance if the accident is perceived to be a "harbinger of future and possibly catastrophic events" (Greber et al., 1994).

One of the surest findings to emerge from the risk assessment field is that people find

radiation and other toxic substances significantly more threatening than most nontoxic technological hazards and natural hazards (Erikson, 1990). Where radiological disasters have struck, the sense of dread lingers well after the incident has been officially declared over. For example, two years after the accident at Chernobyl, fear of radiation was so prevalent that the Soviet government admitted to a problem of "radiophobia" (Erikson, 1990).

The Siting Task Force for High-Level Radioactive Waste has found that the public does not pay much attention to the probability of an accident, but rather looks at the worst case, assuming that an accident will occur (Greber and Anderson, 1989). Moreover, Pieroni (1980) found that the main issue is not whether an accident will occur but rather what will happen when it does occur.

The preceding discussion makes it abundantly clear that the general public perceives the risk of radioactive waste to be much higher than that of the technical and scientific community. Therefore, a reconciliation of these two groups is in order. Initially, the experts tried to educate the public to their way of thinking by bombarding them with facts and figures. This was a waste of time. The discounting of the fears and concerns of the general public by the experts was irritating and broke down communication. Slovic (1993) demonstrated that technical risk assessments have little affect on public perceptions and acceptance of risk from nuclear technologies. The problem is not so much that the technicians and the public place different values on the impacts, rather it is that they have widely divergent perceptions of the probability and scope of the impacts (Greber et al., 1994). However, the public also knows that given a long enough period of time and enough radioactive waste, an accident will occur regardless of the probability estimates.

It is therefore essential to have spokespersons who have good interaction and presentation skills. Technical staff must be trained in communication skills. In communicating risk information, trust and credibility are the most important assets. It is also important to avoid mistakes and get back to people with answers. Finally, promises that cannot be fulfilled must never be promised.

Tourism and Property Value Impacts

Communities are concerned about the economic impacts of a low level radioactive waste management facility on local property values and the tourism industry. The Siting Task Force currently charged with finding a site to store low-level radioactive waste in Ontario recently commissioned a baseline study documenting potential economic impacts on local property values and tourism which may be associated with different types of facilities, such as nuclear facilities and other facilities that may generate public concern. The study examined seven communities in which so-called controversial facilities were located including the towns of Port Hope, Deep River and Chalk River. The results obtained from interviews with several real estate and economic development contacts suggested that the facilities in the case study communities have had either no effect or a positive effect on the average property values in these communities (Dillon, 1993).

In general, it was found that in communities with controversial facilities that current economic conditions, property values and tourism levels did not differ greatly from that in other similar communities or from the Region or County in which they are located. The siting of the

facility in the community had little noticeable impact historically on average property values or tourism, except in the short term where increased demand during construction resulted in shortages in housing or visitor accommodation (Dillon, 1993). In some cases, as migrant construction workers are housed, the shortage of tourist accommodation decreased the number of tourists drawn to the community. This has occurred in the Port Elgin/Kincardine area where the Bruce Nuclear Facility is located. The shortage of tourist accommodation throughout the peak periods of operation start-up became particularly severe as companies associated with Bruce Nuclear and Ontario Hydro booked accommodations for up to six months or more. An associated effect was that some tourists, who previously rented seasonal accommodation in the area, bought a cottage to be assured accommodation.

A representative of Pickering's Economic Development Department (with a variety of recreational activities including parks, marinas and beaches) suggested that the nuclear facility has had no impact on tourism in the area during the announcement, construction and operation time frames of the facility. It was indicated that any changes in tourism occurred because of other influences such as weather, the economy and tourism and recreation trends.

Overall, the presence of a nuclear facility did not appear to deter the growth of the tourism industry in areas with the natural attributes that attract tourists and have access to major markets (Dillon, 1993). In fact, some long term effects on tourism can be positive as accommodation contracts offer generous income for tourist operators. In addition, some facilities become tourist attractions. For example, the Bruce Nuclear Information Centre adds to the range of tourist attractions of the area. It hosts bus tours, educational programs and draws many visitors interested in learning more about atomic energy. It also draws business

travellers to the area, and this in turn creates demands for the food service and accommodation sectors.

In Nepean, the Trail Road Landfill site is in an isolated location, away from the more urban areas of the City and any facilities that may draw visitors. The representative of the Nepean Economic Development Department interviewed for this study indicated that the facility largely goes unnoticed even by residents. The representative also stated that the landfill site has had no impact on tourism, nor did any of the events associated with the landfill site opening affect tourism. This example provides support for the theory of locating these facilities in more remote areas

It was the opinion of both interviewees in Clarington/Newcastle that the Darlington Nuclear Generating Station had not had a negative impact on tourism in the area. It was noted, however, that the presence of a facility along the waterfront has had the effect of seriously constraining the Town's ability to plan the waterfront as a tourist attraction and meet the goals of waterfront planning, in terms of trail development (Dillon, 1993).

It was the opinion of a representative of the town of Newcastle Development Department that the Darlington Facility has had a negative impact on property values of residential and agricultural lands immediately adjacent to the site, and that no impacts have occurred to property values of industrial facilities in close proximity to the site. It was noted that highway 401 acts as a buffer between the facility and the residential area to the north and that no property value impacts have occurred to lands to the north of highway 401.

Even in cases where nuclear emergencies have occurred, property values have not declined significantly. For example, research on the Three Mile Island Facility shows that a short-term drop occurred in the number of sales of housing within ten miles of the plant after the nuclear accident, but housing sales returned to normal within four to eight weeks (Dillon, 1993).

Other studies have suggested that, theoretically, property value loss may occur in specific cases, but this impact may have been overshadowed by positive impacts associated with these facilities such as spending by plant workers on higher priced housing (Hageman, 1981).

The literature demonstrates that any property value impacts vary by type of facility and cannot be clearly attributed to a facility because it is impossible to exclude other external influences (Dillon, 1993). Available studies on property value impacts associated with nuclear plant facilities have generally shown increases in land values. These increases have been attributed to speculation in the vicinity of the proposed nuclear facility site, and increased housing demand by in-migrant workers. In fact, studies of those cases where nuclear emergencies have occurred have not shown significant property differentials between properties located in proximity to these sites and similar properties located further away (Hageman, 1981).

Few studies have assessed the impacts of nuclear waste disposal sites on property values and the existing studies are generally inconclusive. Available literature, however, suggests that property value losses may occur for lands located close to a nuclear waste disposal site if the public perceives that the site poses a health risk (Dillon, 1993). The literature also suggests that when negative property value effects do occur, properties located very close to the site, generally within a quarter mile of the facility, are the most likely to be impacted (Greenberg et al., 1993).

Media Influence

Not surprisingly, people become more concerned about risks that receive media attention. Public perceptions and beliefs are affected by the media. Research has demonstrated that early extensive media coverage of an issue at first presents a negative response even if the tone or content of the story are positive (Mazur, 1981). Bad news about waste management is likely to be viewed as evidence of the high risk and confirmatory to the validity of the individual's perception (Lusker, 1989). Publicity can affect land values, tourism and the value of agricultural products from the surrounding area, particularly if it is negative (Kasperson et al., undated). Media attention which makes a hazard unusually memorable has the potential to seriously distort risk perception. For example, the power of the media was demonstrated by the accident at Three Mile Island in 1979. This accident, which resulted in no immediate deaths or injuries and an expectation of less than one statistical death in the surrounding population of one million, was labelled by the media as a nuclear disaster and resulted in a greatly decreased level of confidence in nuclear power as a safe source of electricity generation (Sims, 1990). An inept display of public relations by the nuclear industry following this incident, most likely helped keep the Three Mile Island accident as a front-page story for about two weeks and it set the pattern for sensationalizing nuclear events and non-events which has been followed ever since by the media. Even after a substantial period of time had passed, stories generated by the anti-nuclear establishment about giant dandelion leaves and prematurely greying hair continued to be published in the media (Sims, 1990).

Some media problems stem from the conditions under which the media works. Tight deadlines may not allow reporters the time or space to deal adequately with the complexities of uncertainties surrounding radioactive issues. Reporters try to achieve objectivity in a story by balancing opposing views. In addition, reporters are very source dependent and tend to rely heavily on sources that are easily accessible and willing to speak out. Moreover, few reporters have the scientific background needed to evaluate complex scientific data (Covello, 1989).

The negative effects that the media can introduce can be remedied in part, if the stakeholders and in particular the proponent, establishes an early working relationship with the media. The media should be provided with information regularly and not just when information is requested. This will decrease the possibility of incorrect or speculative information being released to the public. The proponent should track everything that reporters write or say about the project and correct them when required. The media can be an effective partner in a project if they are treated with respect and approached early on with information. It is important to select a credible, competent spokesperson to interface with the media as well as with the general public.

Faith in Technology, Government and Institutions

Although Canada is a technologically advanced nation there is a segment of Canadian society that lacks confidence in technology. A non-scientific, non-technical person's lack of faith in technology is partly influenced by experiences they have with technologies such as computers

and VCRs that may not respond in an expected fashion and highly technical medical procedures such as new forms of radioactive treatments, that may or may not result in cures. Additionally, the public tends to question technology that is perceived as new or threatening (Foster 1985, Greber and Anderson 1989). For some there may be concern about placing complete trust in new and untried technologies (Greber and Anderson, 1989) especially when there is a tendency for technologies to become obsolete (Pieroni, 1980).

People are more concerned about risks derived from technology when they lack faith in science and technology. Consequently, people who are antinuclear perceive the risks from nuclear waste as higher than those who support it. Conversely when one's personal value system places a high value on growth and prosperity, there tends to be less worry about technological risk (Greber et al., 1994). Fear of technology is peculiarly a phenomenon of the developed and affluent countries (Bolker, 1986). The ordinary peasant in Mexico or India has no fear of technology. In fact, he or she would surely welcome the relief from drudgery that technology can bring. In the developed countries most of us are so far from that drudgery, that we have little sense of how much technology has brought.

Kunreuther et al., (1993) states that the lack of trust is exacerbated by the discovery of health hazards from facilities that were once declared relatively safe. Events that cause negative effects such as the Three Mile Island disaster carry much more weight than events causing positive effects with the result that the whole system through which people obtain information tends to erode trust (Slovic, 1993). The Love Canal affair demonstrated in graphic terms that authorities could not always be entrusted with public safety. Not only did residents of Love Canal discover that their community had been built on top of a dump that held more than

20,000 tons of toxic chemicals, but, the subsequent clean-up of the area was so badly bungled that some believed that the site became more, rather than less, dangerous. A person's initial trust or distrust of technology influences further interpretations of occurrences, thereby reinforcing prior beliefs (Greber et al., 1994).

Other factors undermining trust in government and industry include expert disagreements and uncertainty. In some cases equally prominent experts have taken diametrically opposed positions (Covello, 1989). Difficulties can occur if stakeholders are uncertain because they do not have the amount or kind of information they believe they need to make a decision. Furthermore, environmental and technological risks are particularly vulnerable to uncertainty. Uncertainty is unavoidable as the best health and engineering data will not always be one hundred per cent correct. Models designed to extrapolate results from high doses in laboratory studies to low doses in actual situations are often highly uncertain and controversial (Covello, 1989). Official explanations that the generation of data about health and environmental risks is expensive and time consuming - or that health assessments and management activities are constrained by resource, technical, statutory, legal or other limitations are seldom perceived as satisfactory (Covello, 1989). Frequently the routine uncertainty found in science is misinterpreted as evasiveness, when in fact the uncertainty reflects reality. Often scientists lack suitable layman's language for communicating about radioactivity and all its uncertainties. However, the problem is more than one of just semantics. Often public pronouncements are put in terms of macro language when in fact the average person desires microlanguage so that personal effects can be determined.

This uncertainty can be addressed by the proponent accommodating different perceptions

regarding acceptable risk levels, allowing the community to conduct their own environmental assessments and using independent experts chosen by the host community. Analyzing different scenarios and encouraging interaction among stakeholders can also help alleviate uncertainty (Resources Futures International, 1993).

A declining faith in technology often goes back to the technical experts themselves who are sometimes seen as the cause of the problems. The tendency of technical experts to be poor communicators translates into difficult to understand information which may be regarded as suspect. Information needs to be managed constructively including the volume of information. Although it is important to never conceal vital information, information should be provided at several levels of technical detail in order to meet the varying needs and attention spans of different publics (Resource Futures International, 1992). This is best done by either a technical expert who is a good communicator or a good communicator with an excellent understanding of technical information. If errors are made, they should be immediately acknowledged and an explanation be given for remedial action.

Information about projects must be simply presented with the minimum of jargon. A community must always hear details of a project directly from the proponent rather than read it in a national newspaper if trust is to be fostered. Information should be given openly and at no time should the affected community feel that information is being concealed from them. Openness requires that steps in the siting process are clear, understandable and culturally appropriate (Greber et al., 1994). Openness must cover both the technical and socioeconomic aspects of a siting process.

A superior attitude must be avoided at all costs. Attempts to be doctoral or impatient with the nonscientific approach of the public are sure to spell disaster. Project proponents must maintain an interactive stance rather than employing a lecture format during meetings. The community must be regarded as a legitimate partner in decisions that affect their lives, property and things they value (Greber et al., 1994). Involving the community as much as they desire will increase familiarity, reduce fears and lower risk perception.

Trust and credibility are often mentioned as being the key problems of risk communication (Sandman, 1986). People often distrust the two main sources of public information about radioactive waste - government and industry. The public often believes that government agencies are influenced largely by industry, managers and staff are biased in their choice of disposal methods and that government agencies and industry are neither technically nor managerially competent to construct and operate radioactive waste management disposal facilities in a safe and efficient manner (Covello, 1989). Communities tend to be more concerned with the trustworthiness of their industrial neighbours and their reliability to always do the right thing voluntarily than they are with a company's technical competence to identify the right thing. Canadians also display little trust in their government to protect them from risks to their health. When asked to indicate agreement or disagreement with the statement "When there is a really serious health problem, the government will regulate it. Until they alert me about a specific problem, I really don't have to worry", eighty-nine percent of Canadians disagreed, and forty-five of them strongly disagreed (Slovic et al., 1993). When asked to respond to the statement, "No matter how low the level of exposure to radiation, it can still cause cancer", sixty-two percent agreed, twenty-one percent strongly agreed.

American studies have revealed that the public's antagonistic sentiments towards government and industry and a lack of trust in them is the critical factor underlying the controversies that surround the management of technological hazards (Slovic, 1993). There are plenty of case histories (such as the American companies that manufactured asbestos products) to substantiate a lack of trust.

A lack of confidence in government and industry may be related to a concern that these institutions do not recognize problems, or that they ignore them until it is too late (Greber et al., 1994). Unfortunately, increasing financial pressure will make building and maintaining public trust even more difficult. Governments are indicating that there are inadequate resources for risk assessment and management and the programs needed to become sensitive to the public's needs and concerns (Covello, 1989).

Pieroni (1981) found that participants in focus groups conducted by AECL to determine how the public felt about a high-level nuclear fuel waste depository, questioned the commitment of large organizations to be accountable for the consequences of their actions, their social responsibility when motivated by profit, and their commitment to fully inform the public of the possible effects of new technologies. Ontario Hydro also conducted focus group discussions which revealed similar findings (Greber et al., 1994). Focus group members cited examples such as the use of asbestos in buildings where the government had assured its safety only to discover later that the regulations were inappropriate (Goldfarb Consultants, 1991).

It generally takes many good occurrences to build trust but often only one bad incident to tear it down. Public trust and credibility can only be built by repeatedly involving communities as

full fledged partners in problem solving. If in fact the different agendas of the interested parties are responsible for the distrust in siting exercises as Raynor et al. (1987) maintains, then it would seem key to have the agendas exposed at the onset. Openness will ensure that the public has full access to information. The proponent must be sympathetic and respectful of the public's values. The government showed its recognition of this principle in 1980. A government panel reviewing an application for the construction of a uranium refinery near Warman, Saskatchewan recommended that the impact of the refinery on religious beliefs of the local Mennonite population should be studied further before the project was allowed to proceed (Greber et al., 1994).

Slovic (1993) suggests that the restoration of public trust may require a degree of openness and involvement with the public that goes far beyond public relations and a two way communication to encompass levels of power sharing and public participation in decision making that are only now being recognized within the context of voluntary siting. It is crucial to proponents and recipients of waste facilities to commit themselves to this philosophy of cooperative decision making.

Voluntary siting requires community approval as a prerequisite for site approval and it gives a community the privilege to withdraw from a siting process at any time. Having veto power on siting decisions and responsibility for finding a site with technical suitability and public acceptance reinforces the control aspect (Greber et al., 1994). Government officials are starting to recognize that giving communities the power to shut down a facility is an important incentive for obtaining approval.

Voluntarism and Controllability

The two most crucial factors affecting risk perception are volition and controllability. Over thirty years ago, risk perception studies showed that people are willing to accept risks which are approximately 1,000 times as great as they would tolerate from involuntary hazards that provide the same level of benefits (Starr, 1969). The public is very aware that a waste management facility is an externally imposed risk and the proponent should always keep this fact in mind.

Sandman (1986) summed up the issue of voluntariness by stating that on his own behalf that he may choose to tolerate or protect against a risk but that "for someone else to decide that his risk is tolerable is itself intolerable". Scientific calculations of risk are difficult to hear when someone else had made the decision about the risk that we are to bear. People react first with outrage to the involuntary nature of the risk, which is actually a control and equity issue, regardless of whether they agree on the merits of the decision. People will state that they fear for themselves and their communities when the emotions that truly predominate come across as outrage and distrust (Sandman, 1986). In this way, the control issue overshadows the risk perception.

Oddly enough when a disaster is ongoing, the public tend to put aside their resistance to coercion and demand to be told what to do. It appears that the more overwhelming the threat, the greater the docility with which people will respond to intrusions and the greater their disquiet if no instructions are issued. After the threat is no longer imminent however, the old

pattern of rebuking coercion emerges (Sandman, 1986).

When the public is faced with a risk which is voluntary, familiar, controllable, and fair, they frequently are able to acknowledge the full extent of the risk, remain calm and occasionally underestimate the risk. On the other hand, when the public feels coerced and faced with a unfamiliar, uncontrollable and unfair risk, fear, suspicion and anger are likely even if statistical data is reassuring (Sandman, 1986).

Using a volunteer process can change the view of a waste management facility from an externally imposed to an internally imposed process. The recent waste facility siting in Swan Hills, Alberta where two communities competed for the right to site a toxic waste management facility provides evidence that the volunteer process works.

Voluntarism facilitates community empowerment and local control with respect to participating in site selection. Those who could be affected by development projects and motivated by a distrust of government and industry, insist on being meaningfully involved in decisions and want some control over the things that will affect them. Furthermore, communities willing to take on so-called undesirable facilities want a negotiating role in determining what they will receive in terms of impact management.

Voluntariness and controllability have become the cornerstones for siting task forces including the Low-Level Radioactive Waste Siting Task Force in Ontario and the recent successful hazardous waste facility siting in Swan Hills, Alberta (McQuaid-Cook, 1991). The greater control a community has over the design, construction and operation of a waste facility, the

more likely the community will endorse the project. In fact, research by Lyons et al. (1987) revealed that economic incentives were ranked as less important than local control when evaluating people's willingness to live near a hazardous waste treatment facility.

Voluntarism results in empowered communities able to make decisions about whether or not their community should be considered and evaluated as a potential site. In this way the siting process is characterised by "cooperation rather than confrontation" (McTaggart-Cowan et al., 1987). Communities maintain control over their future and are less likely to feel victimized as was frequently the case under the "decide-announce-defend" siting process common earlier on.

Controllability has been shown to be second only to volition in terms of influencing risk perception (Cohrssen and Covello, 1989). People feel more positive about a risk if they feel that they have personal control over it. There are three vehicles through which the public can participate in decision making in Canada. They include: parliamentary or legislative committee hearings, royal commissions and environmental assessment reviews. Additionally, AECEB also solicits public input during policy formulation (Corner, 1991).

The Angus Reid Group (1988) carried out a poll which asked Canadians what conditions would make siting a nuclear waste disposal facility near their community acceptable to them, and found that people considered community control in siting decisions and independent monitoring of the facility to be the most important. More recently, 103 American students were asked to rate the impact of forty-five hypothetical news events pertaining to management of a nuclear power plant in their community. Only one event had any substantial impact on building trust, which is a crucial component in perception and acceptance of risk. This event

stated that: "An advisory board of local citizens and environmentalists is established to monitor the plant and is given legal authority to shut the plant down if they believe it to be unsafe " (Slovic, 1993). Providing access to information and giving a community the power to shut down a facility and have independent monitoring and representation are effective means of gaining approval (O'Hare et al., 1983).

People tend to perceive risks of a project to be greater when they have little or no input into decisions and/or limited access to information or finances (Kasperson, 1990). Imposing authority in environmental conflicts has, until recently, been to deny the feared consequences or to minimize them. In either case these tactics are defended by a "common good" argument, and supported by scientific evidence about its safety (Lee, 1993). The combination of this unmistakably authoritarian stance and one-way communication pattern zaps all control away from the affected communities and encourages confrontation. In response, the protest group's strategy is to gain maximum publicity for their beliefs and arguments that make up their cause and discredit the other party (Wildgruber, 1991). Every group in a conflict relationship wishes to see itself and the opposition to be in completely different categories; the differences between them are therefore constantly accentuated in order to achieve the "in-group" solidarity that will ensure unified action and result in ascendance or victory (Lee, 1993).

It seems obvious that a volunteer siting approach which goes hand in hand with increasing community control and decreasing risk perception can only improve the odds of successful waste facility siting. As early as 1979, Krawetz noted that proponents of successful siting were demonstrating commitment to fostering good community relations, public involvement, access to information and the cooperative involvement of government, industry and

environmental groups (Krawetz, 1979).

The voluntary siting approach was successfully used in the siting of Alberta's hazardous chemical waste disposal waste management facilities (McQuaid-Cook and Simpson, 1986) and Manitoba's central hazardous waste management facility (Richards A., 1992). In the United States it was successfully used for siting a low-level radioactive waste management facility (English, 1988). Currently in Ontario, the voluntary siting approach is being used for the selection of a site for low level radioactive waste (McTaggart-Cowan et al , 1987) and in the United States this approach is also being used for the siting of a monitored retrievable storage facility for high-level radioactive waste (Mussler, 1992, Richards M.D., 1992).

Canadian government officials and experts have increasingly recognized that there is a need for a greater emphasis on collaborative and nonadversarial approaches to problem solving and decision making if success is to be achieved by siting task forces. New approaches which include involving the public earlier and more often, conducting research to gain a better understanding of community concerns, giving social concerns equal weighting with environmental and economic ones in impact assessment studies and decision making, disseminating information in lay language, and conducting more proactive public education programs, have been undertaken to resolve siting problems (Armour, 1990)

Shared decision making is necessary for a speedy identification of key socioeconomic and cultural factors which can affect siting. Consulting local communities, which often consider a wider range of possible impacts (economy, infrastructure, environmental impact of similar activities) at the very beginning when data is still very scarce, may make the participation

process more acceptable to concerned people (Wildgruber, 1991). In addition, the public may think of issues not thought of by the other parties involved.

Not everyone will wish to become involved. However, someone confronted with making a decision is more likely to be interested in collecting information. Unfortunately, some of those who are very involved in an issue tend to collect only that information which supports their point of view and provides the necessary defence to support their position. Some may feel overwhelmed by the task and possibly believe that they will be unable to affect the course of events. Still others are just apathetic - they may have about as much going on in their lives as they wish to handle and have no interest in learning anything more or worse still, effecting change.

While voluntarism and control play key roles in the success of a waste facility siting, another factor, compensation must not be underestimated. Impact management and compensation programs can be the "carrot" that communities are looking for when deciding whether to accept a facility or not. Moreover, it would not be surprising if the role that compensation plays (along with voluntarism and control) increases over time as more and more communities feel fiscal pressure and the need for more control through power sharing with proponents on projects.

Impact Management

Many believe that there is a need to redress negative impacts on the community (e.g. to compensate for a decrease in property values). For example, repairing the physical landscape

that may be harmed by siting activities is frequently a requirement of a siting agreement and part of any program which supports sustainability. Economic incentives such as giving community grants and/or reducing or waiving taxes and providing service subsidies (to allow expansion of needed services) and property value protection are perceived by some as fair and by others as bribes. AECL maintains that an implementing organization should make a commitment that the host community should not be worse off as a result of the facility than it would be without it (Greber et al., 1994). In fact, AECL also supports the negotiation of a net benefits package in recognition of the valuable service the community would be performing for society if it accepted a radioactive waste management facility.

The potential for increased local employment, economic benefits in terms of increased spending and tax dollars, and the effects on tourism, property and land values merits consideration. Projections concerning consequences after site closure needs to be considered. Compensation packages should be custom designed to reflect community interests to the greatest extent possible. They should be reasonable and encompass the concerns of all legitimate stakeholders. All components of a compensation package should be formally declared and become part of the final siting process. There should never be any concealed side deals.

There are three major objectives underlying the approach of providing compensation and incentives to potential host communities (O'Hare et al., 1983). The first is to make amends for any unavoidable and residual effects so that the community is left no worse off than before the facility was developed. Secondly, to redress inequity in the distribution of costs and benefits and thereby ensure that the community is left better off as a result of facility

development and lastly, to increase public acceptance of the proposed facility.

People perceive risks as greater when they are allocated a larger share of a risk than they should have had if risks and benefits had been fairly distributed (Cohrssen and Covello, 1989). The appropriateness of institutional arrangements and procedures by which policies are formulated and implemented and by which associated risks are allocated is also important (Greber et al., 1994). Host communities are always interested in the risk/benefit trade-offs associated with waste management facilities to be located within their jurisdiction (Cooper, 1993). People will take into account potential benefits such as compensation packages in their evaluation of risk (Kunreuther et al., 1989). As a result, those living near a controversial site may evaluate the project quite differently from those living further away. The employment and economic benefits anticipated by those living near a site may result in a clash with the more abstract environmental concerns held by those in adjacent communities (Nelkin et al., 1979).

Negotiated siting agreements have been used as a means of addressing community concerns and of gaining local acceptance of siting proposals. These types of agreements focus on issues resolutions and impact management (Greber et al., 1994). Impact management programs are used to minimize or redress potential undesirable impacts and enhance benefits. Negotiated siting agreements give the community a greater role in the siting process which facilitates the development of mutually acceptable terms and conditions for impact management.

Negotiated settlements should provide a needed approach to address issues relating to perceived risks, trust, control and inequities in the distribution of costs and benefits. The

effectiveness of a negotiated settlement depends upon how well the settlement responds to the concerns of the community. For example, it must accurately reflect the true concerns of those affected and impact management must be designed jointly with the community and the proponent to suit the community's priorities. For negotiations to be truly effective, all parties must have sufficient power to influence the actions of other parties (Cormick, 1987).

People are more concerned about hazardous activities which are perceived to have questionable or vague benefits (e.g. use of nuclear power in a country with large oil and gas supplies) (Greber et al., 1994). In fact, average risk ratings have been found to be significantly affected by perceived and individual benefits (Slovic, 1993). This suggests that risk perception on the part of the public is a net value (the difference between risks and benefits) rather than overall indicators of potential harm (Gregory and Mandelsohn, 1993). Researchers suggest that the risk may be reduced by increasing the strength of associated benefits rather than using resources trying to convince the public that the risks are minor (Kunreuther, 1989). However, extreme care must be taken when negotiating benefits packages so as to avoid the perception that the community is being bribed to accept a particular project.

Risk and mitigation go hand-in-hand; one cannot talk about risk, real or perceived without discussing what the proponent intends to do to reduce risk (Resource Futures International, 1992). Mitigation is the means by which risks to the host community including social, psychological, environmental and financial risks are addressed. Mitigation measures are set up to ensure fairness and minimize or negate negative impacts. Examples include such things as building roads and sound barriers to eliminate noise, dust and traffic on local roads around a waste facility. An extra measure could be an assurance to protect a buffer zone with tax

breaks in the immediate area of the waste facility site to prevent property devaluation.

Compensation packages are used to address equity issues that arise from unavoidable negative effects of a facility. There are two schools of thought on this practice. The first school believes that compensation packages that go beyond in-kind compensation (to replace what was lost), can be construed as bribery and the second believes that communities that agree to host waste facilities should be "appreciated" for their service.

Compensation includes the measures taken to compensate/reward those who are accepting the inconvenience of hosting a waste management facility (Resource Futures International, 1992). Mitigation measures must be matched to risks but compensation may or may not be matched. John Jackson (1993) of the Ontario Toxic Waste Research Coalition, feels that compensation sidetracks the community from focusing on the main issues of concern in the siting of waste disposal facilities. He believes that we should not make up for unacceptable waste facilities by means of a luxurious compensation package. Rather, the focus should be on finding a more acceptable way to solve the waste problem (Jackson, 1993). Jackson (1993) feels that compensation packages divert the discussion from the technical and social issues surrounding the facility and can be used as a way of undermining opposition to a project. He fears that a compensation package can become a wedge that divides the community between those who want the compensation and those who remain unwilling to accept the risks. In fact, some community residents find discussion of financial compensation to be insulting because it implies that they can be bought off (Jackson, 1993). Jackson (1993) further states that "the extent to which we need to focus on compensation in the siting of a waste disposal facility should be seen as a "measurement of the extent to which we have failed to properly take care

of the waste management program".

Jackson (1993) believes that the proponent is trying to sell two contradictory messages to the public. The first is that the proponent is reassuring the community that the disposal facility is safe to live next door to, and that it will not negatively impact the lives of those adjacent to it. Secondly, the proponent is offering to compensate the community for the negative consequences of living next door to the landfill or incinerator. These opposing messages can cause community members to be sceptical about the guarantees being made to them and suspicious of the motivations behind the compensation program.

In contrast to Jackson's claims, many researchers conclude that affected communities generally feel that they should be compensated and rewarded for taking a facility others are not prepared to accept in their community (Lemieux et al., 1993). This second approach accepts that compensation should not only compensate a community in a way that offsets all costs but also leave the community better off by enhancing possible positive effects or adding extra benefits as part of the facility siting package. This type of compensation is sometimes referred to as an incentive or a net benefits package. It includes any compensation which would be over and above any compensation that would be granted for a community sustaining unavoidable or unmitigated effects of a disposal facility (Greber et al., 1994).

Nonetheless, proponents of the second approach believe that a community should be compensated by adding extra benefits as an acknowledgement of the service the community is performing on behalf of the broader public interest (McTaggart-Cowen et al., 1987). It is important to note that a net benefits package should never be used as a bribe to induce a

potential host community to accept a facility that is unsafe or environmentally unsound (Greber et al., 1994). Whether or not a net benefits package is considered to be a bribe or not depends upon how the various stakeholders see the situation.

The balancing of positive and negative aspects of a proposal to the satisfaction of the stakeholders is also referred to as "off-set compensation" (Resource Futures International, 1992). The guiding principle underlying the issue of off-set compensation, is that compensation should only be considered once full consideration has been given to risk issues and measures proposed to mitigate this risk. All necessary efforts should be directed towards mitigating known negative impacts that apply to the proposed site. Some examples of off-set compensation include expanded emergency services, special training for community members, environmental enhancement projects (such as planting trees), bonus services and facilities (such as recreation facilities), investment money, preferential hiring of people and local businesses and tax subsidies which may include whole or partial payment of taxes.

Portney (1984) determined in a study of hazardous waste facilities that people are more concerned about personal safety than about financial or property losses and, consequently, will tend to place greater importance on proper mitigation and contingency measures over compensation.

Traditionally, siting operations have spoken of compensation in relation to presumed harm resulting from a project. This assumed negative approach should be countered in part by picking the right site in the first place - the one that will result in the fewest negative impacts. Concerns of public health and safety need to be discussed and managed with the communities.

The proponent should implement measures to first avoid potential negative effects, then minimize the severity of them and finally compensate for any remaining adverse affects (Grehner et al., 1994). Public and occupational safety should be protected, by the proponent providing equipment and training community members in radiological and hazardous waste management and emergency response. Impact management procedures which are open and allow for joint planning and emergency planning procedures should be negotiated with a community during the siting stage (Grondin et al., 1994).

A commitment to health, safety and environmental protection should be a prerequisite for any siting project. Conducting baseline and follow-up health studies and environmental testing is an effective method for addressing the public concerns about a facility. There should also be a commitment to continued improvement in operations that can protect health and safety. Risks should be kept as low as possible. Operating standards and procedures must not be compromised and improvements should be incorporated as they become available. There should also be stated the provision that the community would have the power to shutdown operations should key conditions not be met (Resources Futures International, 1993).

Research findings tend to confirm that a combination of incentives with risk reduction measures increases the acceptability of a facility. When Visocki (1988) looked at a wide range of locally unwanted facilities, she concluded that compensation and other incentives could be effective in gaining local acceptance provided that technical studies were regarded as credible and policy decisions were seen to be sound and fair. Even when the community was suffering economically, incentives and compensation were mistrusted when the sponsor's technical credibility was low and/or policies were considered unfair or unsafe (Visocki, 1988).

For example, the Case studies of two U.S. projects suggest that success in siting may be more a function of policy considerations (willingness to negotiate) and the balance of power than of the technical factors relating to risk/benefit considerations (Cooper, 1993).

It is useful to examine how other groups have dealt with the compensation issue recently. English (1988) reviewed the experience of eight American States in siting low level radioactive waste management facilities. She found that they all included compensation and local benefit provisions as part of their siting requirements. Although concluding that scientific rigor and procedural fairness are not being abandoned, English states that it has become increasingly clear that economic advantages are more persuasive, especially if they are combined with measures to ensure safety and local control.

Swartzman et al. (1985) determined that offering compensation (such as property tax reductions and payment of a tipping fee to the community along with risk reduction inducements (such as increased monitoring frequency and increased control over who monitors) was effective in increasing people's willingness to live near a hazardous waste landfill site.

Carnes et al. (1981) also found in a 1980 study of 426 Wisconsin residents in three rural counties where a high-level nuclear waste repository was being considered that compensation and other incentives had a positive influence on people's attitudes towards the project. It was found that the percentage of those who declared that they would accept a repository increased when incentive packages were enriched to the point where a respondent indicated that a

"package" of incentives would be sufficient. A package consisting of substantial payments to the community, access to information, independent monitoring, representation on a governing board and the power to shut down the facility resulted in an acceptability level going from twenty-two per cent up to forty-two per cent. When respondents ranked incentives, providing access to information was indicated to have the most impact followed by payments to the community, provision of the option to shut down the facility, independent monitoring and finally, representation on a governing board.

The Manitoba Hazardous Waste Management Corporation included a community benefits package in its joint agreement with the Rural Municipality of Montcalm including a commitment to maximize opportunities for local residents and businesses to benefit from its hiring, purchasing and contracting requirements, designing and landscaping the facility and site in manner which is aesthetically acceptable to the community, and operating a household hazardous waste and used motor oil drop-off at no charge to residents and landowners (Manitoba Hazardous Waste Management Corporation, 1992).

Cameco Corporation (includes the former Eldorado Nuclear Limited), operator of the Rabbit Lake uranium mine in northern Saskatchewan, employs preferential hiring, a fly-in commute system, pre-employment trades training, academic awards and scholarships and summer employment to involve local northern residents. Bonus services such as hockey schools, cross country skiing, northern games, fund raising projects and school tours to many different destinations including the mine are also offered (INTEREC Resources Consultants, 1993).

Chem-Security (Alberta) Ltd., the operator of the Alberta Special Waste Treatment Centre near

the town of Swan Hills contributes to the community through modest donations and scholarships. Funds were also donated for tree planting and construction of a golf course (Maureen Payne and Associates, 1993).

The Township of West Lincoln in Ontario negotiated a compensation/mitigation agreement with the Ontario Waste Management Corporation in return for agreeing to host a hazardous waste treatment facility. The agreement included property value protection, tax subsidies, compensation to the Township for lost revenue from successful property assessment appeals, royalty payments of \$25 per tonne of waste treated, free disposal of hazardous wastes for residents, two million dollars for improving recreational facilities and a new fire truck (Garr, 1993).

A co-management agreement between the Manitoba Hazardous Waste Management Corporation and the rural municipality of Montcalm included not only the formation of a community liaison group but also the establishment of a Plant Co-Management Committee made up of representatives of the local municipality and senior plant management whose purpose is to jointly determine the decisions concerning the plant's development, operation and monitoring (Connell, 1993). The establishment of a Workplace Safety and Health Committee composed of employee and management representatives and overseen by the Plant Co-Management Committee was also set up to monitor compliance with legislation and regulations. Under the co-management agreement, the facility operator pays all travel, operating, support and other expenses required to include members of the community in the co-management process. There are also provisions for community protection programs including land value and agricultural product marketing programs, environmental monitoring

and reporting, training and emergency response and postclosure monitoring and maintenance. Financial and other support for these programs was provided by the proponent.

Compensation in the form of commitments or guarantees can be given to ensure the honesty of an operation. Communities can be provided with provisions for monitoring and for resources needed to ensure continued community involvement should be provided. For example, Ontario Hydro has provided grants to municipalities near some of its facilities so they can increase their planning capacity to deal with large-scale projects. Funds have also been provided to assist in hiring independent consultants to advise municipalities on facility related issues (Greber et al., 1994).

Timing of compensation discussions is often awkward. Introducing compensation at the earliest stages can make the siting procedure look like a "done deal" and this can cut into an institution's control and volunteer option. More importantly, it may look like a bribe and this can defeat the entire process. In fact, some consider it to be preferable that the community initiate the subject of compensation (Resource Futures International, 1992). On the other hand, some communities may not wish to get involved until they know what is in it for them. For example, one of the participant communities in the low-level siting to be studied in this proposed thesis felt so strongly about equity compensation for volunteering to accept a facility that they had even set a price for their compensation at the onset (McTaggart-Cowan et al., 1991).

In some countries such as The Netherlands and Germany, direct financial compensation to the community as a whole is virtually nonexistent and is considered to be an unethical practice

(Resource Futures International, 1992). Financial compensation of individuals such as landowners however is an accepted practice. In contrast, compensation to individuals, as well as to groups, is quite common in France (Resource Futures International, 1992). Canada falls somewhere in the middle with many different approaches and philosophies being used depending on the individual site selection process.

An impact management process that addresses mitigation, enhancement, compensation, monitoring and contingency measures, and community liaison measures, can contribute to the siting of a low-level radioactive waste facility and enhance the acceptability of risk (Grondin et al., 1994). Proponents of a potential site can further reduce inequities by recognizing that there is a high value to society by having its waste safely disposed and that "appreciation" should be shown to any community who is willing to host such a facility. As the foregoing has explained, the primary way in which a proponent deals with the social equity issue is by providing compensation programmes. However, distributional equity (a fair distribution of risks and benefits) must always be balanced with procedural equity (the way one arrives at the solution) (Greber et al., 1994). People become quite hostile if they feel that they have been unfairly treated in both the process leading up to the decision as well as the outcome (Colglazier, 1988). Regardless of how generous a compensation package might be, it is all for naught if the process by which decisions were made did not allow for effective public involvement and the achievement of informed collective consent (Greber et al., 1994). Justice will only occur if a waste facility would be in society's best interest and if those communities that are incurring actual or potential bad impacts are properly compensated and offered a means of redress.

Narrowing the Risk Perception Gap

As previously discussed, mitigation and compensation packages provide an incentive to a community considering hosting a waste management facility. Mitigation and compensation packages on their own, are insufficient incentive if the risk is perceived as being too high. Fortunately, there are ways of bridging the risk perception gap.

The risk perception gap is not one between correct and incorrect, between knowledge and ignorance, or least of all between rational and irrational (Lee, 1993). Rather it is described as a difference between two mind sets; two totally different approaches to risk assessment, each being used for different purposes (Lee, 1993). If it is so difficult to change the public's perception of nuclear associated issues, then maybe the experts need to change their mindset and enrich their definitions of risk so that the two groups can come closer together. This is the approach presently being taken by many siting task forces. Risk assessment is no longer just a simple number crunching exercise. In fact, the public tends to be suspicious of data manipulation and therefore, reliance on numbers alone to explain risk is inadvisable.

Perhaps nothing contributes so much to the public's understanding of risk as finding a way to make it personal. Reporters know this and frequently ask questions that personalize both the source of the information and the information itself in an effort to make the information more memorable. It would therefore be prudent that those undertaking waste facility siting become involved on a close community level.

Since some risk aversion is inevitable, it appears logical that successful risk communication

hinges on accepting the predictability of risk reactions. To those feeling concern about risks it is important to accept the factors which affect their perception of a risk as being legitimate. Proponents of waste facilities need to be open minded, sensitive and not defensive. To effectively communicate about a risk it is important to first find out what people want to know and not to sideline them to carry out your own agenda. If the top priority is for information on health effects or property value protection make it a top priority to gather that information as soon as possible. This also demonstrates good faith.

Agenda 21 as put forward at the Earth Summit in Rio de Janeiro in 1993 declared that environmental issues are best handled with the participation of all concerned citizens (United Nations Conference on Environment and Development (UNCED), 1992). Nations are urged to facilitate and encourage awareness and public participation, particularly among women, youth and indigenous peoples by making environmental information widely available (UNCED, 1992).

As a matter of good ethics, the public should be a legitimate partner. The goal of risk communication is not to diffuse public concerns or prevent action but rather, to produce an informed public. Sharing more, rather than less information is a good motto to follow. It is important to involve the public before major decisions are made. The public's views and concerns must be acknowledged and integrated in the project planning process. Proponents must provide information as required and listen to concerns and take action as appropriate. This is not only good business, but, good ethics as well.

Ethical Considerations

Undoubtedly, controversy will surround waste facility siting. Therefore in any siting process, it is necessary to utilize an ethical framework to manage the process. Consideration of moral principles, and of accepted rules and standards of conduct should apply to waste facility siting. Such things as a commitment to justice, openness, health and environmental protection, voluntarism and joint decision making should also be part of an ethical framework.

An international workshop on settling environmental conflict provided three examples of where an ethical basis was felt to be a prerequisite. Firstly, the context of the siting process must not just focus on choosing a waste facility site but rather it should consider the larger issues of waste source, amount, and conservation. Secondly, the community must be well informed concerning the process and the proponent must be open and willing to share information. Lastly, no community should be asked to accept a waste management facility without negotiated and sufficient mitigation of risks and compensation for any inconveniences that may arise (Resource Futures International, 1992).

Timmerman (1984) argues that there are a series of moral dilemmas surrounding hazardous waste management over such things as rights, division of risks, obligations and benefits and the well being of society at large. These dilemmas result from a clash between two values systems, neither of which accepts the premise upon which the other operates. Utilitarianism which is concerned with the good for the majority, is difficult to reconcile with a strong individual rights philosophy such as that put forth by Nozick (1974). A small group of people with a vested interest can deny a much larger but less personally involved group of people,

facilities that would be to their general benefits. In fact, time has shown that the NIMBY syndrome is accepted. Moreover, considerable sympathy and status is appointed to such pressure groups by the media and by politicians as they are seen to be defending their community and values (Curd, 1988). Despite the myth that local pressure groups are at a serious disadvantage when confronting a potential developer, history shows that they have been remarkably successful at getting their own way (Curd, 1988). It takes a brave politician to stand up and argue that electors must do their bit for the common good because their back yard is ideally suited to host a waste management facility.

Utilitarianism at least suggests that there is an obligation to safely manage radioactive waste but, an individual rights philosophy implies that we have no obligations or only minimal obligations to future generations. The "principle of mutual benefit" based on Rawls (1971) notion of reciprocity, in which mitigation equalizes risk and benefit for some individuals on behalf of the needs for an entire society is a more suitable theory for waste management.

Individualism and utilitarianism both have short comings in the context of radioactive waste. It is unacceptable to minimize the risk of radioactive contamination or illness if it means hardship for an individual or group of individuals. We live in a society in which individualism tends to predominate. In this context, defending the special interests of several opponents often takes precedence over community solidarity and well-being (Ruegg et al., 1993). In Ontario there are legitimate concerns that shipping radioactive waste to the north is discriminatory even if it is supported by the theory of utilitarianism. Exporting a disproportionate amount of risk resulting from technology that benefits another region is seen as unfair. This inherent ethical problem can be minimized by incorporating the principles of justice, fairness and openness so that

inequality issues may be addressed.

Determining what is equitable can be a difficult process. Standards of fairness have developed over time; sometimes there is a societal norm or consensus that clearly determines what is fair and unfair. However in many individual situations there are no widely accepted norms of fairness to provide clear guidance. A person's view of what is fair in a specific situation is affected both by that person's application of certain normative principles and by his or her own special interests.

The literature on ethics suggests that there is strong agreement that those who produce low level radioactive waste should be responsible for its safe disposal. This is supported by the principle that those who derive benefit from an activity should be responsible for its safe management and disposal (Kasperson 1993, Greber and Anderson 1989). Agenda 21 developed at the Earth Summit in Rio de Janeiro supported this philosophy by declaring that creators of waste should, in principle, bear the cost of waste management (UNCED, 1992). However, responsibility should not just fall upon the producers of the waste but, it should include those who also benefit from its production. Some communities who already have their share of waste management facilities may be unwilling to accept extra waste management responsibilities. Cooper (1993) found that the incremental burden was not only important, but also definitive, in achieving host community satisfaction.

Locational equity ensures that the costs, risks and benefits associated with a facility are balanced. Ontario's Low-Level Radioactive Waste Task Force recognized that a facility siting task force which aims for the voluntary participation of communities could be open to

"locational opportunism" in that it might lead to socially and economically disadvantaged communities being exploited (Armour, 1992). For example, Northern Ontario may volunteer while Southern Ontario, which is the primary waste producer and beneficiary, may accept their offer. Locational equity should also insure that those who have already assumed their fair share of the "waste burden" would not become candidates again.

The task force studied in this thesis demonstrated concern over locational equity. This led to the adoption of five safeguards in an effort to protect against this. They are as follows: communities will be made aware of their range of options through an impact management policy; community hired advisors will ensure that locational interests are protected in the process of joint fact-finding and problem solving; thorough site and technology assessments will be carried out with input from the community, the Siting Task Force and technical experts; a broadly based Community Liaison Group will be established to work with the Siting Task Force and local officials; lastly, funding will be provided to allow for community participation in the process (Armour, 1992).

Some ethical issues brought forth by AECL in relation to work done by the high-level radioactive waste siting task force provide some valuable insights for the siting of all types of facilities. They include: a conviction that wastes should be located near their origin so that those receiving the benefits could then assume the risks, a fear that Northern communities with their sparse populations and limited political power could end up being dictated to by Southern communities and lastly, that remote siting would be a way to minimize both risk and disruption of communities (Greber et al., 1994). When looking at highly radioactive substances the public feels (eighty-five percent) if a nuclear waste disposal facility is not safe

enough to put near a populated area, that we have no right to impose it upon more remote communities (Greber, 1989).

A discussion of ethical issues such as responsibility to future generations, global responsibility and distributive rights have a place in all siting activities. This is consistent with the concept of sustainable development as defined in the Bruntland Report (1987): "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". The Earth Summit in Rio de Janeiro reinforced this philosophy by declaring that "Development today must not undermine the development and environment needs of present and future generations" (UNCED, 1992).

An overriding concern when looking at radioactive waste is that decisions made today can have a negative effect on future generations if not managed properly. The breakneck progress of our generation has not only been purchased at a cost of this generation but also that of future generations. Unfortunately, the interests of future generations of people who will live in the community and the environment are rarely seriously addressed in the development of compensation programs. One reason for this is that it is not possible to definitively predict the long term effects of such a facility. Moreover, there are many types of uncertainty surrounding this issue not only on a scientific level, but, also on a human and societal level. Humans eventually make mistakes and society is ever changing. It is therefore necessary that any disposal system be constructed with a high tolerance for error (ie. multiple barriers). To partially compensate for changes that may occur over time, a system which is in harmony with Nature would be ideal (Persson, 1988).

The concept of perpetual care is not defensible; those who espouse it are not being honest with the public. Long term care for several hundred years or even a thousand can be defended but 10,000 years certainly cannot. Pushing our responsibilities for the waste we generate onto future generations or imposing future health risks that would not be acceptable today are generally not acceptable.

During an ethics workshop held by AECL, participants suggested that part of the social responsibility of the present generation is to undertake thorough research to provide the best knowledge base possible to ensure that responsible decisions can be made about the long-term safe management of nuclear fuel waste (Greber et al., 1994). There is also a public expectation that the program would continue ongoing research in order to enhance the technology and allow the best decisions to be made (Greber and Anderson 1989, Pieroni 1986). There is no reason to assume that the management of low level waste would not be subject to the same philosophy.

According to Strohl (1990) ethical standards for the control of radioactive wastes should not differ from those for other types of hazardous wastes. Bodde (1983) maintains that nuclear waste management should not warrant attention out of proportion to other societal dangers. Moreover, participants in an ethics workshop sponsored by AECL concluded that a particular problem (such as nuclear waste disposal) should not receive a vastly disproportionate share of resources because of its political profile compared to other waste management problems (Greber et al., 1994).

Ethical behaviour will foster the development of trust which is so essential when carrying out

siting operations. Mutual respect in a siting situation is much like mutual respect in other relationships except that it has a "risk" hurdle to overcome. Trust is dependent upon a clear demonstration through words and deeds by the proponent to a commitment of the principles of safety, environmental protection, openness, equity, fairness, voluntarism and shared decision making, as well as consistent application of these principles throughout the siting phase (Greber et al., 1994). Mistrust is believed to originate from regimentation imposed by regulatory bodies, inconsistent policies or application thereof, differences in interest groups' priorities and past bad experiences (Resource Futures International, 1992).

It is important that the implementing organization (the one who ultimately will manage the project) be the one who takes the lead role in a siting process rather than hired outside consultants because the trust element is so important for a siting project. People need to be able to judge for themselves the trustworthiness of a proponent and not just public relations individuals trying to sell a project. A key factor in the successful siting of a hazardous waste management facility in Manitoba was considered to be the existence of a clear proponent (the Manitoba Hazardous Waste Management Corporation) as the implementing organization (Richards A., 1992). Furthermore, this siting revealed that it takes a long time for an effective trusting relationship to form between a community and a proponent (Richards, A., 1992)

People may not only desire that emissions be kept as low as reasonably possible (A.L.A.R.A. principle) but also that production of radioactive waste be at the lowest level to begin with. Western ethics have traditionally been dominated by rules for the actions of individuals in pursuit of their needs and interests. However, now that the horizon's of responsibility are broadening to include the consequences of human actions for the condition of all life far into

the future, the common responsibility which all humankind collectively bears must be given consideration as never before. Perhaps the best solution is that it is the responsibility of those who benefitted from nuclear power to bear the cost of its disposal and ensure its safety so that future generations will not be obliged to take measures to protect themselves. Some assert that in order to protect future generations that any system must be repairable so that mistakes now can be repaired in the future. The demands for safety in operation and reparability are, in part in conflict with each other. Safety in operation requires to a certain degree a sealed repository while reparability requires, in a somewhat different sense an accessible repository (Perrson, 1988). Thus, we have an ethical dilemma.

Good ethics can go a long way towards paving the way for a successful siting process. A firm commitment to justice, openness, health and environmental protection, voluntarism and joint decision making comprise the majority of the principals of the voluntary siting process outlined by its founder, Audrey Armour. The challenge remains for those charged with the responsibility for siting radioactive waste facilities to strike the correct balance between these issues while at the same time effectively managing risk and compensation.

Experiences of other Countries

It can be useful to look at the experience of other countries. In most of the world, siting is proponent driven and the public has very limited involvement. Public participation for the most part is a superficial exercise of a limited duration.

A survey in Finland determined that people think that energy related decisions are made both remotely and in an undemocratic way (Corner, 1991). In a survey by Corner (1991), just over half of those questioned believed that the use of a country wide referendum should be used to make decisions regarding construction of nuclear power plants. A majority also felt that local opinion should be decisive in new nuclear power plant decisions.

In Japan the formal process begins with a year long review with only one day set aside for a public hearing. At the conclusion, the Government, which is supportive of nuclear technology, insists that industry secure local support for a proposed project prior to construction (Corner, 1991). This seems to be a very odd approach to take if public acceptance is a prerequisite for construction.

Switzerland does not provide for public inquiries but, there are intervenors which may include local authorities, protest groups and other groups who can effectively slow down any approval procedure. Referendums are held but they are not binding on the Federal Government (Corner, 1991).

France stands out as a country where both policy formulation and implementation are for the most part closed to public participation - and it is the country where nuclear power and waste disposal has been remarkably successful, thus demonstrating that nuclear power and waste disposal can sometimes be more successful when the public is not given a chance to contest

France's success may also be attributed to two other reasons. France has very limited options for internal energy generation, and therefore, nuclear energy is most likely considered a

2

PM-1 3½"x4" PHOTOGRAPHIC MICROCOPY TARGET
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necessity. Although siting is a proponent driven process, an inquiry is carried out after technical requirements have been met which allows the public to ask questions and there is an obligation that all questions be answered. Secondly, it appears that the people of France have a greater confidence in their nuclear professionals but, then, they have reason to. The French government pays their nuclear people very well, considers them elite and educates them well. Certainly they are going to make mistakes but they are certainly more prepared than those in the United States for example. In the United States most nuclear power plant operators are high school graduates with a couple of years technician's training.

In Sweden, municipal councils must give their permission for nuclear facilities to be built and a local veto cannot be overruled by parliament. Public inquiries are held and serve as guidance to authorities. However, once construction permits for a facility are granted there are no formal possibilities for formal public inquiry (Corner, 1991). This approach most closely resembles Canada's recent approach of the voluntary siting process.

The primary conclusion arising from an International Workshop on Negotiation and Mediation Procedures for the Settlement of Environmental Conflict held in 1990, was that a siting process should not begin with a predetermined solution, but, rather an acknowledgement of a problem. Workshop participants describe the traditional siting process as "a solution looking for a home" while the recommended process, the voluntary siting process, is referred to as "a problem looking for a solution" (Resource Futures International, 1992). The latter approach allows the proponent and the major community representatives to consult each other and decide upon which process they will follow with the hope of a successful siting (Resource Futures International, 1992).

The same workshop determined that certain prerequisites must be identified so that a cooperative approach to waste facility siting evolves (Resource Futures International, 1992). Firstly, they recommend development of a national waste policy which is founded on waste reduction goals and initiatives. They also believe that greater attention needs to be directed towards the overall problem of waste generation and ways in which to reduce waste. At the root of this problem is the issue of sustainable development which includes economic development which respects the environment and social values (Resource Futures International, 1992).

A View from the Normative Literature

At the initiation of a site screening, there will be a variety of stakeholders who have broad and diverse interests in the siting process (Greber et al., 1994). A major stumbling block to the consultation process and in the development of an agreement occurs when there is an inadequate identification of those community members who should be in the process or else they do not participate as actively as they should. It is the responsibility of the implementing organization to ensure that a thorough communications program is implemented that would reach all potential stakeholders and provide a clear indication of who can be involved at each stage and in what capacity. The invitation to participate should be non-exclusionary. Any groups who have an interest in the project, including interest groups such as non-governmental organizations, regional public interest groups, and members of corridor communities from outside the community should be invited to participate. Public administrators and regulators should be involved as well and help with maintaining a focus upon identified objectives and

keeping the "big picture" by forward thinking (Resource Futures International, 1993).

Having all the cards on the table from the beginning is preferable. Frequently this is not possible as some groups may chose to not get involved initially as their way of carrying out a silent protest. Other groups may just suffer from inactivity in the early stages. Some groups will only become active late in the day as they increasingly see themselves impacted by the siting process. This "eleventh hour activity" may also characterize large, national environmental groups (Resource Futures International, 1993). For certain, the earlier involvement of all interested parties, the better. Early involvement of all relevant social groups increases the integration of differing interests with the consequent avoidance of stonewalling (Dunker, 1993). Failure to involve all groups in the initial stages can lead to a great deal of lost time when latecomers can stall or stop the process. To more easily accommodate latecomers, it is important to build flexibility into the process. There also needs to be a mechanism in the process that will continuously verify positions (cooperative or not) during the process since, it would be foolhardy to believe that those "on board" will always stay "on board".

From the onset of the siting process, it is important for the proponent to quickly determine how itself differs in relation to the site culture and acknowledge and respect any differences. The proponent should demonstrate a commitment to ongoing flexibility and always maintain a high profile and accessibility within the community even if it means setting up an regional or local office (Resource Futures International, 1992). It is essential that the differences between the proponent and the community be respected at all times and that the proponent manage and respect the differences between community groups. Some of the differences that may be

encountered include: technical competence level, involvement in past siting experiences, cultural differences and values (ie. native people tend to have a different sense of responsibility to the land), competence and experience in decision making, perceived level of responsibility, laws, conduct codes and norms and values and institutional barriers outside the community (ie. financial, legal and educational) (Resource Futures International, 1992).

The customary approach taken when using the voluntary siting process is to form a large committee that includes all stakeholders so that the chance of a partnership of interests is increased. The proponent has the responsibility to seek input from community stakeholders in order to identify issues and cooperatively develop solutions. The proponent should also make sure that the community stakeholders have the resources (financial, administrative and human) needed to participate as a competent partner. This may mean that the proponent may need to subsidize stakeholders for things such as travelling expenses.

As the process unfolds, the number of participating communities decreases. Then the interests of the remaining communities become more focused on matters such as social equity, benefits, mitigation, compensation and other issues (Resource Futures International, 1993).

The next step, the creation of community liaison groups gives a voice for the community and increases control. A citizen advisory group is also beneficial in providing a buffer and a means to undertake technical analysis of a project proposal (Cooper, 1993). The federal Siting Task Force for the Low-Level Radioactive Waste Siting Project examined in this thesis and the Alberta Special Waste Management Corporation project both have community liaison groups which enable the communities involved to oversee operations. In addition, the

aforementioned Low-Level Task Force has proposed that four members of the six-person Board of Directors for the waste disposal facility be appointed by the community (McTaggart-Cowan et al., 1987).

For an effective community consultation the goal is to involve the stakeholders in an interactive manner. Effective public communications involve a strategy which lays out the communications objectives, target audience, message source and channels or vehicles to be used to increase awareness among a broader audience (Resources Futures International, 1993).

A successful strategic communications program must also be proactive and flexible so that it can keep abreast of changing attitudes and beliefs. Changes in the public's ideas often occur in reaction to political and social events and direct experience. One indication that social issues evolve and public priorities change is provided by polling research that monitors and tracks issues of concern to the Canadian public. Understanding the relative priority placed by the public on nuclear waste management compared to other environmental policy matters helps in determining the degree of public concern about the issue. Nuclear waste is not an issue that presently dominates the public agenda, that is, it is not generally raised by the public as a concern unless they are prompted to reflect on it (Greber et al., 1994). Other issues of concern like Quebec sovereignty and unemployment are more likely to be sited as major top of mind concerns.

The siting process should be iterative and interactive (Resource Futures International, 1992). The process does not have to move in a strictly sequential fashion, rather, the process should move forward, backwards or sideways as the ever-changing circumstances warrant. This

flexibility is needed to accommodate the entry and exist of different interest groups, stages in the process, policies and technologies . The siting process should be designed so that it can accommodate changes with a minimum of disruption of the process. The interactive feature means that the process is not run by the proponent, but jointly by the major stakeholders (Resource Futures International, 1992). Without a community's input, the siting process is flawed and likely to fail.

In view of the increasingly tense political situation with regard to the environment and the pressing need to make decisions, administrators are realising that they should welcome public debates on planned projects and include worthwhile suggestions arising from them. The publication of plans and the inclusion of suggestions, objectives and personal valuations from those affected in the early stages is seen as an opportunity for developing socially acceptable decisions (Dunker, 1993).

The success of a communications and planning program depends to a great extent upon the personality types of the members of the working party (Dunker, 1993). The process is also influenced by events preceding the planning procedure and the political motivations leading to its initiation (Dunker, 1993). Cooper (1993) found that a common denominator amongst successful waste facility sitings was the political acceptability of the facility to elected officials within the community. The nature and extent of participation by appointed and elected officials is considered key to the process.

It is important to gauge community support during the siting process. One commonly used method includes voting through a referendum. However, this procedure is subject to pitfalls.

People may be dissatisfied with the wording or others may give a negative response from what may simply be an uninformed position. For a correct decision to be made, a referendum assumes that everyone has all the information, understands it all, will make a logical decision based solely on this information and lastly, that all people will cast a ballot (Brethour, 1992). Not only is this assumption false, but, in fact some people will neglect to vote in order to avoid getting involved in this controversial issue. Effective measurement should determine the purpose of the measurement and the types of methods which best fit the proposal.

Measurements must be done regularly in consultation with stakeholders so that changes are detected as soon as possible and the measurements must be objective and defensible (Resource Futures International, 1993). The most accurate method of evaluation would be to survey all community members personally. Since this is economically prohibitive, it is crucial to obtain the highest voter turnout in a referendum.

To guarantee fairness in siting decisions the local community should take precedence in siting decisions and have the power to veto a disposal site if desired. It would certainly make it easier for a community to enter into the siting process if they knew that ultimately they would have the final decision whether to become a site or not. The negative side of voluntary siting is that if all communities opted out, then a great deal of resources would be wasted and the problem of what to do with the waste would still remain. Moreover, the process would lose its credibility if a task force had to eventually impose the site upon an unwilling community to protect the greater common good.

An initial package given to communities should include terms of reference of the proponent, protocols for interacting with potentially affected communities, including roles and philosophy,

and appropriate technical information. The proponent should hold community information meetings and workshops and consider establishing public information offices or hotlines staffed with a person who can provide information and liaise with the community if the community desires such a service. Information should be presented to the public in an understandable form and be readily available and important information should never be withheld.

A siting agreement should contain many elements such as specifications for roles and responsibilities of all stakeholders, operating conditions, communication requirements, mitigation and compensation provisions, resources available for community continued involvement and community monitoring (Resource Futures International, 1993). Additional elements suggested by the members of the 1991 International Workshop on Siting of Waste Management Facilities include: remedial measures for unforeseen impacts, conflict resolution mechanisms, protocols for whistle blowing and corrective action and specification for a shut-down and provisions for renegotiation and making changes to the agreement (Resource Futures International, 1993).

The same workshop cited above also came up with several keys to success. First, was a justification of the program and a master plan, since, few communities truly want to host a low-level radioactive waste management facility. It can even be difficult to site a facility in a community when the waste is generated by that community. The process should have the support of high level key players and adequate resources to allow the effective participation of interested parties. Early and sustained open, honest and credible consultation and communication among stakeholders is imperative. Other success factors include having a

consistent, well-conceived public communications and information program. Expectations must be identified, monitored and met. Unfulfilled expectations can create a stumbling block to successful site selection. To prevent this, the proponent must be honest from the beginning and not hold back any information. Expectations should not only be identified and clearly articulated but, they should be revisited periodically to determine if they are still relevant and if they are being addressed (Resource Futures International, 1994).

All stakeholders should map out together a plan for the consultation process. Major stages of the consultation process including the definition of and agreement on the siting problem and the assessment of project options and mitigation plans, need to be outlined and framed with appropriate time limits. A carefully constructed consultation plan will minimize the possibility of problems occurring later on.

Consultation must be done at the convenience of the participating communities and remain flexible. There must be a desire to meet identified goals and strive for consensus and also a willingness to accept the right of the community to say "no". Lastly, the agreement should never be viewed as being final (Resource Futures International, 1993).

A prior relationship with the proponent may also be a factor influencing the success of siting efforts, especially if the community is economically tied to the proponent. For example, East Bridgewater in Massachusetts was approached by BFI to host a waste management facility. The revenue generated by BFI amounted to a large percentage of the town's annual operating budget, and there was a strong stake in maintaining that source of income (Cooper, 1993). Prior to a referendum vote on whether to accept a hazardous waste treatment facility in Cache

Creek-Ashcroft, British Columbia, the local business association ran three consecutive full page advertisements in the local paper pleading with the voters to support the facility and the forty jobs that it would create (Foley, 1993). In fact, even the referendum was worded in order to allay public concerns about the proposed facility and the ballot actually stated that there would be 40 direct permanent jobs created as a result of the facility (Foley, 1993). To vote "no" to such a proposal would not be to solely turn down the proposed facility but, also to say "no" to jobs. At the time Cache Creek was suffering from severe unemployment. Considering these two examples, it would not be unreasonable to assume in the case of Ontario's Low Level Radioactive Waste Facility Siting that Deep River, with its dependence on AECL for jobs and economic prosperity would also be similarly inclined.

There is concern that waste facility siting will over time become increasingly complex and subject to increasing rules and regulations. Flexibility would then be lost and the ability to follow a cooperative siting process with voluntarism and controllability as the major principles would be jeopardized.

Increasing public knowledge and awareness has lead to greater empowerment. Citizen experts proliferate and demand information disclosure and the right to be involved. The result is increased demand for community input and, potentially, more resistance and conflict. Resistance and conflict notwithstanding, it is believed that the outcome will be more consensus and better decisions (Resource Futures International, 1992).

The most expensive siting process is a failed one. Therefore, it is worth investing whatever measures are necessary to get the job done. Including voluntarism and control as the guiding

principles of the siting process will undoubtedly lead more consensus between the community and the proponent and greater costs in terms of dollars and time, as the technical standards remain consistently high and are joined with equally or even more demanding social criteria. However, rising costs could have a positive effect: they may encourage organizations to reduce their hazardous waste production and/or develop new ways to manage their wastes because the costs of delegating this task to an outside organization is prohibitive. This may result in more friendly environmental practices. For the most part, scientists have been very successful at designing the technical aspects of a siting plan. What is required is a refining of the process from a social and political point of view.

Literature Overview

Overall, the literature appears to be well substantiated and thorough. In particular, the explanation of risk perception is very enlightening and it clearly explains the public's multifaceted fear of all things radioactive. This information fits well with the recently advocated voluntarism approach to waste facility siting, as these two concepts are interconnected. The literature fully recognizes the effect of the media and the public's declining faith in government and institutions on waste facility siting, and offers some helpful suggestions on how to address these issues.

Although the model of voluntary siting as put forth by Audrey Armour appears to have the most potential for integrating the scientific, social and political dimensions of the siting process, it is still in its infancy stage. Documentation of this approach has primarily been written by people who have been employed directly or indirectly by the governments which are endorsing it. Consequently, research on the effectiveness of voluntarism needs to be continued and documented from a more neutral standpoint.

Additional research is needed on the role of compensation in waste facility siting. The literature at this point is contradictory with some researchers being very opposed while others believe that compensation is essential.

There also needs to be more attention given to the ethical aspects of the waste facility siting problem. Thus far, most authors have only briefly examined this issue and dictated the need

for a consciousness about sustainability. Very few suggestions have been put forth concerning how to effectively deal with the subject.

There are a variety of siting processes being carried out all over the world, many of which appear to be done in isolation. Further documentation of the effectiveness of various approaches needs to be pulled together through an international study. Along with evaluations of the effectiveness of various siting approaches, the other side of the equation which is the characteristics that lead a community to respond to a siting invitation, should be examined. The literature would be more complete if the typical research project was expanded to include a study which also looks at community characteristics and tries to determine if there is a cluster of community characteristics that make a group more amenable to the siting of low-level radioactive waste facilities. The following thesis will look at six communities that persisted to an advanced stage in a siting process and determine if there are community characteristics associated with an increased interest in hosting a LLRW facility. In these times of fiscal restraint it would be advantageous if resources could be focused on those communities which are more inclined to consider hosting LLRW management facilities.

RESULTS

Brief Overview

For simplicity sake, the majority of the results are presented in tabular form. This enables the maximum amount of information to be delivered in the least space and it also facilitates the comparisons that this study requires. The tables are arranged so that the communities are ordered from left to right based upon their duration in the siting process. For example, the community in the far right column is the only community still remaining in the process.

The first table presents a list of nine community characteristics drawn from the hypotheses. The final six communities which had either their town council or their CLG recommend continuation in the voluntary siting process were compared on the basis of these characteristics. The researcher found that three of the final four communities in the process appeared to have many common characteristics and the first two of the six to drop out, have few characteristics in common with these four. In fact, the first two to withdraw from the process were remarkably similar on the basis of the tested characteristics.

The research revealed that the type of community that volunteered was a relatively small community (less than 20,000 people) which was likely to be experiencing a decrease in population, and in particular, a decrease in the number of employed persons. The economies were based upon a limited number of businesses and it would not be surprising if the

community had strong ties to whichever government was carrying out the siting exercise. Past or present radioactive waste production appeared to lead to greater participation as it helped combat the risk perception issue and fulfil ethical obligations. Previous experience in determining the consequences of technology and handling of radioactive waste also made it more likely that a community would remain in the siting process.

The second table looks at issues affecting participation in the siting process of a LLRW management facility based upon nearly all of the key factors identified in the literature as playing a role in siting exercises. It also parallels the literature review exactly. The primary finding was that the majority of the communities seem to feel essentially the same on a multitude of issues. Secondly, voluntarism and control seemed to increase a communities willingness to host a facility. Thirdly, information gathered on impact management and ethics revealed that communities did not view compensation as a bribe but, rather, they feel it is a necessity and as such it should be discussed more openly earlier on in the process. There was also a strong feeling that those who benefitted most from the activities that created the LLRW in the first place should bear the heaviest burdens. From all sources, concerns and potential solutions were examined. On account of there being such a vast number of findings resulting from this exploratory research, additional factors will be examined more closely in the discussion section.

The third portion of the results section includes two case studies of major source communities. These are also set up in parallel to the literature review. They provide a comparison for the host community case studies found in the appendix and they were also used to validate the information obtained in this study and to gain a wider view of how the volunteer siting

process worked. For the most part the source communities reactions to the process were quite similar to the voluntary communities.

Finally four interviews carried out with STF and STF Secretariat members are documented in order to balance the information supplied by the communities. Frequently, the conclusions formulated by these groups were in agreement with the communities. However, the most valuable part of the testimony of these individuals was that it enabled the researcher to see the process from another angle.

Results

TABLE 1
Characteristics of Communities Obtaining Approval from their Town Council
and/or their Community Liaison Group to Continue in the Process

Characteristics	Communities					
	Town- ship of James	Home- payne	Elliot Lake	Geraldton	Port Hope	Deep River
Previous experience handling radioactive waste			√		√	√
High levels of past or present radioactive waste production			√		√	√
Prior experience with waste facility siting			√		√	√
Higher than average levels of unemployment			√			
High percentage of government related positions				√		√
Low community economic complexity	√	√	√	√		√
High levels of tourism			√		√	√
Previous experience in determining the consequences of high levels of science and technology			√		√	√
Low population levels	√	√	√	√	√	√

Legend

√ Indicates Characteristic Present

TABLE 2
Issues Affecting Participation in the Siting Process of a LLRW Management Facility
Based Upon Factors Identified in the Literature

Issues	Communities					
	Township of James	Horne-payne	Elliot Lake	Geraldton	Port Hope	Deep River
Motives for Involvement						
Support the voluntary siting approach	I	I	B	B	D	I
Good citizenship	D	D	D	D		I
Use/share prior LLRW experience			B		B	B
Gain information	D	D	D	D		
Gain expertise in LLRW	D	D	D	D		
Improve/diversify economy	D	D	D	D		B
Recent job losses		D		D		B
Expected job losses		D	D	D		B
Job creation	D	D	D	D		B
Minimal public opposition				D		B
Ensure proper disposal of local waste			B		B	B
Opportunity for co-disposal			D		B	B

Legend

- D Found in Documentary Material
- I Found in Interviews
- B Found in both

Issues	Communities					
	Town- ship of James	Home- payne	Elliot Lake	Geraldton	Port Hope	Deep River
Involvement Patterns						
Minor political involvement until major decision points		I	B			B
Mayoral support	D			D		B
Minor public involvement until major decision points	D	B	B	I	B	D
Organized opposition	B	B	B	I		
Tired of discussing issue	D		B	I	B	
Environmental Suitability						
Available lands	D	I	D		B	B
Infrastructure in place			D		B	B
Concerns about lake/river contamination	D	D		D	B	B
Concerns about groundwater	D	D		D	B	B
Concerns about seismicity	D					B
Concerns about geology						B
Concerns about soil	D					B
Indian land cautions	D			B		

Legend

- D Found in Documentary Material
- I Found in Interviews
- B Found in both

Issues	Communities					
	Town- ship of James	Home- payne	Elliot Lake	Geraldton	Port Hope	Dee River
Opposition based upon:						
Fear of radiation risk	B	I	B	B	B	D
Fear of chemical risk	B	I	D	B	B	D
Uncertainty about waste contents - i.e. level of radioactivity?			D	B	B	D
NIMBY	I		B	B	B	
Health and safety	B	D	B	D	B	
Transportation distance	B	D	B	D		B
Traffic level	B	D	B	D		B
Strong tourism effects			B			
Minor tourism effects	B	D		D	B	D
Property value effects	D	D	D		D	D
Threatening to relocate	D	D	D			
Media bias	D		D			
Fear of gaining a bad reputation	D		D			D
Incompatibility with community plans			B			
Belief that few permanent jobs will be created	D	B	I	D	D	

Legend

- D Found in Documentary Material
- I Found in Interviews
- B Found in both

Issues	Communities					
	Town- ship of James	Home- payne	Elliot Lake	Geraldton	Port Hope	Deep River
Declining Faith in Governments and Institutions						
Previous experience with LLRW and government			D		D	D
Changing siting guidelines					D	B
Suspect inadequate funding for entire process	B	D	B	I		
Suspect inadequate funding after decommissioning	I	D				
Suspect government would not honour compensation commitments	D					
Question facility safety	D		D	I		
Low confidence in opposing scientific views		D				
Fear of being forced to:						
- host site	B	B			D	D
- assume ongoing waste	B	B	D	I		D
- assume extra waste volume	B	B		I		D
- assume high level waste	B	I		I		D

Legend

- D Found in Documentary Material
 I Found in Interviews
 B Found in both

Issues	Communities					
	Township of James	Home-payne	Elliot Lake	Geraldton	Port Hope	Deep River
Concerns of Potentially Affected Communities						
Transportation effects				I	B	D
Tourism effects				D		D
Health and safety effects					D	D
Compensation accessibility	B					D
Increasing tension in relation to volunteer community	D				D	B
Desire voting rights	D				B	D
Desire input to decision making	D				B	D
Impact Management						
Compensation considered a key factor	D	B	I	B	B	
Prefer compensation discussion to occur earlier		B	I			
Concern about CLG's minimal role in compensation					B	B
Suspect inadequate compensation	D	D			I	

Legend

- D Found in Documentary Material
- I Found in Interviews
- B Found in both

Issues	Communities					
	Town- ship of James	Home- payne	Elliot Lake	Geraldton	Port Hope	Deep River
Ethics						
Basic concerns about waste production and reduction	D					
Utilitarian orientation i.e. doing their part for society			D	D		B
Concern of North as the South's dumping ground	B		D	B		
Opinion that those who produce waste should manage it	D		D	B	D	D
Opinion that they have already done their share			D		B	D
Fear of harming future generations	B	I	D	D	I	B
Opinion that it is fiscally irresponsible to ship waste far distances		D	B	D	I	B
Petitions/Referendums						
Petitions circulated	D	D	D	D		
Referendum	D					B
Referendum premature	D					

Legend

- D Found in Documentary Material
 I Found in Interviews
 B Found in both

Issues	Communities					
	Town- ship of James	Home- payne	Elliot Lake	Geraldton	Port Hope	Deep River
Siting Process Concerns						
Process too flexible	D	D			I	I
Rushed public involvement stage	D		B			B
Overly time consuming	D	D		I	B	B
Government responses too indefinite	D					B
Government long response time to questions					D	B
Ambiguous roles and responsibilities		D			B	
Opinion that the STF has no real authority						I
CLG over-involved technically	D	D			B	I
Opinion that information is being withheld		D		B		D
Opinion that depressed communities are vulnerable targets for siting	D		D			
Causing community division	B	B				B
Highly expensive				I	B	D

Legend

- D Found in Documentary Material
- I Found in Interviews
- B Found in both

Issues	Communities					
	Town- ship of James	Home- payne	Elliot Lake	Geraldton	Port Hope	Deep River
Recommendations						
Become well acquainted with community prior to undertaking siting related activities	I	D				
Increase personal contact between STF and STF Secretariat and community	D					I
Require elected representation on the CLG					I	I
Cope better with confrontational aspects	D	D				
Clearly separate roles	D	D	I		I	
More defined timeframes		D	I		B	
Clearer budgetary guidelines			I			
Give early compensation guidelines		D				
Simplify technical information		D	D	I	B	
Reduce Information overload			D		B	
Increase timeframe for public involvement	D	D				D
Provide standardized presentation for CLGs	D	D			D	
Require measures for unseen impacts						D
Promote potential tourism effects of an LLRW facility	D					
Select larger CLG to allow for drop-outs				D		
Make certain that process is uninterrupted					D	D
Designate a proponent					D	D

Legend

- D Found in Documentary Material
 I Found in Interviews
 B Found in both

Major Source Community Case Studies

Clarington/Newcastle

Motives for Involvement

Clarington, (formerly known as Newcastle) is located on Lake Ontario, 75 kilometres east of Toronto, bounded by Oshawa, Peterborough and Hope Township. The Southern boundary follows twenty-five miles of the Lake Ontario shoreline. Most of the area is covered by farmland.

The eighteen hectare Port Granby facility is in Clarington which is about sixteen kilometres west of Port Hope. In 1955, this site, located on bluffs overlooking Lake Ontario, began receiving wastes from Eldorado in Port Hope. Originally, the material was dumped into ravines on the site, and later, pits were excavated for this purpose. In 1977, the Atomic Energy Control Board (AECB) called for remedial work to control the leaching of material from the site into Lake Ontario. AECB became increasingly concerned about erosion of the bluffs and the long term stability of the site. The AECB issued an order in 1980 that the site be closed and cleaned up because of concerns that they had about erosion and the long term stability of the site. Presently, the decommissioning order is being held in abeyance until the STF finds a permanent site for the wastes.

Clarington's Community Liaison Group was established to facilitate community participation in the joint problem-solving and decision making process related to the remedial action plan development. The CLG's primary mandate was to develop a public consultation program that

would ensure community residents had full opportunities to make their views known, obtain information and participate in planning and problem solving.

Involvement Patterns

A public involvement needs assessment study was conducted to gather information on what the community believed was the best way to carry out a public participation program and identify additional information which may be required to respond to identified concerns, and to ensure that residents are provided with opportunities to participate in activities where their concerns will be addressed. From the Public Involvement Needs Assessment Survey, it was found that of the sixty people interviewed, forty-three were aware of the STF and forty-five were aware of the CLG. Most said that they had become familiar with the two groups through newspapers, word of mouth and CLG meetings (Clarington, a, h).

Overall, the CLG chairman felt that apathy prevailed. One person felt that the reason for low attendance was because the town will be leaving a problem and not taking on someone else's (Clarington, f). Another resident reflected on the lack of enthusiasm and attendance at outreach meetings despite the fact that letters were delivered and residents were contacted by telephone (Clarington, d). Another resident asked how can anyone can expect a good turn out as people are busy with their own lives. One frustrated resident stated: "I can't go to another meeting, why don't you have one meeting a month where you can have three experts instead of three meetings a month, there are so many community meetings on different issues and this particular one has been around for years and years" (Clarington, e). The suggestion was to stop having meetings and get to the heart of the problem. This resident felt that too much money was being spent

heating around an issue (Clarington, e). Another person felt that the reason that people did not come out to the meetings was because they regard the CLG as the so called "experts" and they truly have trust in this group and they respect their judgement.

Municipal council was concerned that there was not enough communication between the different parties. The CLG felt that council must take a more active role and not just be a recipient of final reports. The CLG wanted Council to provide more support of the process and the efforts of the CLG in order to build trust. Furthermore, the CLG felt that it was necessary to coordinate with the other two source communities so that their solutions were compatible. They also felt that they should work with the remaining potential host communities to be sure that their preferred solution would accommodate the requirements of their community (Clarington, i).

Health and Safety

Safety was the overall concern of the wide majority. Almost all other concerns were a variation of the safety issue such as safety of people and the environment. There was concern about airborne contaminants, spillage, and safety for those working with the waste (Clarington, h).

Transportation

A general concern for transportation safety was mentioned most often by those interviewed for the Public Needs Assessment Report. Some wanted to know if moving the waste was more harmful than leaving it alone (Clarington, h).

Trust in Government

The Public Needs Assessment Report found some sceptics who believed that the process was a "make work" program for the government and that its purpose was to delay the clean-up of the dump and pacify people (Clarington, h).

In a presentation to Elliot Lake's CLG, Veldhuis, an environmentalist and Clarington's CLG chairman made no secret of the fact that Port Granby definitely did not want the waste because of what he said were lies to the residents in the past. "When the waste was first brought here during the 1950's, town residents were told it was only limestone and that one could sit on it without developing any ill effects". Later they found out that it was radioactive waste caused by the refining process at Eldorado in Port Hope (Clarington, j).

There was a nervousness concerning what would happen if the waste was moved by truck and dust blows into the air and lands on the grass. People wondered if they would know how much would land on them and would it be wise to believe any answer they were given. They were not sure if they could trust the government to give them truthful answers (Clarington, b). In fact, trust was considered to be a major issue (Clarington, c). One resident stated that you cannot trust anyone in government regarding health issues (Clarington, c).

There were uncertainties about the hiring of experts. It was felt that because the process was so new that the government may not know what experts to hire and whether the experts would provide good advice. There was scepticism also about experts in general as they were the ones

that put the waste there in the first place (Clarington, c).

There was an element of concern that the federal government may not carry through with its dedication to this process. This may be due to financial or political reasons. The CLG felt that it needed to have adequate resources including time to work through the process. It was deemed important to carry on the momentum generated in phase III (Clarington, i).

The community wanted the siting task force and the secretariat to provide assurances. Clarington also wanted a commitment on the part of the federal government that the solution to the problem will be carried out in accordance with the community's wishes (Clarington, i).

Ethics

There were concerns about the effects of the waste on future generations. People asked "what will happen to our grandchildren?" The situation was described as scary, but, not hopeless (Clarington, b).

For some this LLRW question was an important social equity issue covering a lot of bases. For example, some residents were still grappling with the social equity dimension of why they were a source community in the first place. People questioned the equity of the transportation and the disruption of the community. They wanted to know when people along the transportation route would be allowed to participate and how much input would they have in the process (Clarington, c). Veldhuis replied that the legal stance was that people along the route have every legal right

to look for compensation and to see that everything is in place including safety measures. Although corridor communities can work out any packages with the federal government that they want, they cannot by law stop the movement of material.

Siting Process Concerns

Overall, it was felt that the roles of the Community Liaison Group and the source community were not that well defined. The process was believed to be more directed towards the potential volunteer communities than the source communities (Clarington, h). This of course was compounded by the fact that there is no visible proponent.

One resident wrote a letter to the CLG protesting the cost of the process (Clarington, k).

Recommendations

Some of the suggestions made to make the process more effective included simplifying technical information and increasing action and reducing talking (Clarington, h).

Some members of the CLG wished to have more direction and structure from the STF (Clarington, g). For example, one member stated a preference for a consultant to recommend how to manage the waste. He just couldn't see the general public dictating how the waste should be managed. He felt that it made sense that consultants who have studied all their lives, tell them

how it should be done. Another CLG member agreed but went further by suggesting that a professional should read the material and put it into perspective and in lay terms (Clarington, f).

The CLG asked for clarification as to who was the proponent but, no clear answers were provided upon inquiry. The task force claimed that it is not the federal government and Cameco at this point is only considering the role. Mr. P. MacCulloch of the STF claimed it was the community. This worried the community because to them it meant that if the process fails, the community is left holding the bag. The CLG chairman replied that they were not the proponent. It is their waste and they are looking for a site to move it to. It is his understanding, that the ultimate proponent is the cabinet of Canada. They of course will give it to Natural Resources Canada who then becomes the actual operative proponent (Clarington, g).

Hope Township

Motives for Involvement

Hope township passed a resolution (236/90) which stressed the importance of Hope Township retaining control of how their wastes are excavated and transported. They also wished to hire advisors of their own choosing and to commission whatever studies may be required during the remaining process (Hope Township, a).

Involvement Patterns

As part of a report on the Public Involvement Needs Assessment, fifty-six interviews were carried out to obtain a range of concerns and information needs within the community about the issue of LLRW at the Welcome Site and the Co-operative siting process. Most were aware of the STF and its mandate to seek a volunteer community for a LLRW management facility. Some cited the CLG members and word of mouth. Most understood the CLG's role and many understood the consultative aspect of that role (Hope Township, g). The primary source of information in regards to the waste issue was the local newspaper.

With one exception, all residents interviewed were aware of the Welcome LLRW site and the majority of the interviewees had questions and concerns about the site as it is currently operating. There were mixed opinions about leaving LLRW on-site with better containment versus transporting the waste out of the community (Hope Township, e).

Health and Safety

The greatest concern was for health and safety issues, environmental issues and the remedial action plans. In fact one of the primary reasons that residents became involved was because of their desire to protect human health (Hope Township, c). People specifically mentioned the water system and groundwater and a fear of continued leaching from the site affecting future generations, as well as the current adequacy of monitoring the site (Hope Township, c).

There were fears that digging up the waste may cause greater risks to health and safety than leaving it alone (Hope Township, e).

Transportation

A vast majority of the residents voiced concern the physical process of digging up and moving wastes to another community. It was interpreted as a notable risk to health and safety (Hope Township, e).

Trust in Government/Ethics

People stated that those responsible for the waste should pay for the cleanup and that the government should follow through and solve the problem as it was thought to have gone on long enough (Hope Township, e).

Siting Process Concerns

The process was described as determining perceptions at a place in time that can be affected by education and changing political and personal circumstances (Hope Township, e).

The CLG took offense to the STF Secretariat's use of funds. In one instance, four consultants had appeared to make a presentation concerning viable options for source community transportation of LLRW at a sub-committee meeting where there were suppose to be only two. The CLG chairman had requested that they have extra members of their CLG at the meeting but, because of a shortage of funds it was denied. The chairman of the CLG felt that showing up with four consultants instead of two at a time of restraint, not only of this project, but of federal

spending, did not enhance the cooperative process with the public (Hope Township, b).

A major concern had to do with timing. For example, some important aspects of the process were rushed due to impossible timetables (ie. sometimes there was not enough time to review important documents). The agenda was heavy; there was little free time between sessions. It was very difficult to pick up the information without a break. The STF responded by agreeing to allow two to three weeks between sessions in the future (Hope Township, d). The CLG felt that this issue was frustrated by the practice of reports being dealt with only a layer at a time (Hope Township, c).

Another complaint was that sometimes schedules were too easily broken creating a problem of local credibility. On occasion, key STF members would not be present for important CLG meetings. This led to community concerns being perceived as unimportant (Hope Township, c).

The CLG chairperson expressed concern about the CLG members heavy involvement in technical issues which were detracting from members focusing on their fundamental role which was consultation with the community. He added that this duty should be left to consultants (Hope Township, e).

Ground was lost as a result of cut backs at the STF. A delay of nine months occurred in the Process awaiting a cabinet decision for future funding. This delay caused a loss of momentum and the CLG had to be reactivated with start-up workshops in February of 1992. One of the individuals that the community had built an excellent rapport with was no longer part of the

process and this affected trust and communication (Hope Township, c). It was also thought that communication could be improved by using more lay terms and simplifying things (Hope Township, d).

At the time that this research was gathered, Hope township had a concern about what they consider to be a potential fatal flaw in the process. That is that there are only two potential volunteer communities. The second is that there had not been enough investigation of the feasibility of moving the wastes from the Port Hope area through other communities to the potential volunteers. They were worried that even if there was a single volunteer community at the end of the process, that the reaction from the communities through which the waste will travel will be sufficiently adverse that it may affect the project (Hope Township, a).

Recommendations

Hope Township residents suggested that information should be delivered from an independent analysis by qualified experts, presented in layman's terms to give a sense of being informed and the opportunity for feedback (Hope Township, f). It was also suggested that the provincial and federal ministers of parliament be briefed on a regular basis (Hope Township, e).

STF and STF Secretariat Interviews**Highlights of Interview with the Secretary General Dr. Vera Lafferty, June 29, 1995**

Dr. Vera Lafferty, the Secretary General in charge of the voluntary siting process, saw her role as being that of a project manager working in partnership with the STF chairman. She viewed the CLG as a subcommittee of council with the responsibility of reporting back to council on a regular basis.

Dr. Lafferty explained that the STF implements the process and is free to both interpret the Opting for Cooperation guidelines and reorder priorities. In her position as the accountable manager for the Task Force, she believed that she had to stay within the terms of reference and the mandate. However, she mentioned that she began to find the process constraining once the guidelines had been published.

Dr. Lafferty explained that checkpoints (called milestones) in the process were used to evaluate if process was still relevant. When questioned about how the federally imposed break in the process between stages three and four affected the process, she mentioned that it resulted in a loss of some momentum. The corresponding budget cut back to sixteen million dollars (from an initial twenty-two million dollars) resulted in the referendum being moved forward so it would occur before detailed engineering work occurred. In addition other parts of the process had to be "rejigged".

Dr. Lafferty found that the STF Secretariat staff attracted many individuals who were "anti-

Ottawa" and who had complaints to air because they were from Ottawa. People would frequently bring up issues that had nothing to do with the project.

Overall, Dr. Lafferty saw the siting of this radioactive waste as a social and political problem rather than as a technical problem. When asked if she felt that this was reflected in the allocation of resources she said that the social side was "given a lot of funding" and she found that the amount was adequate to carry out public consultation. Dr. Lafferty stated that she found public consultation to be the most difficult part of this process. She felt that expectations were too high. She added that this had been complicated by the lack of a proponent and a project champion. She questioned who was really in the driver's seat.

Dr. Lafferty felt that the CLG work term carried on for too long with the result that some CLG members become entrenched in their positions. It was her belief that you could never have a CLG that would remain neutral as it is impossible to disassociate feelings. She also stated that being a CLG member was a burden. As an example she described the time when the CLGs were involved with the technical aspects of the project. Problems resulted because the decisions made by the CLG concerning technical matters did not match the required standards and clean-up criteria and thus, had to be rejected or reworked.

Dr. Lafferty described the process as smooth sailing after the CLG in Deep River resigned. Following the CLG's resignation, the STF and the Secretariat dealt directly with town council.

When Dr. Lafferty was asked if she saw this as a risk perception issue she replied that by and large that it was not perceived that way in Deep River but, that Port Hope was a complex

community with a strong segment who feared the LLRW although they had lived with it for years.

One of the observations that the Secretariat General made about the process was that she felt that compensation should have been discussed earlier and been more upfront. She was also concerned that the voluntary siting process was such a lenient program that it was too easily subject to abuse.

Highlights of Interview with an Unidentified **STF Secretariat Member** - December 1994

This anonymous member of the Secretariat (staff unit that guides the STF) explained that one of the primary reasons that the task force was devised was to recognize that the social side of the issue is the difficult part. The technical details are well known and the big problem is how to persuade people that it is possible to incorporate concerns so they feel comfortable with a solution.

This member of the STF Secretariat who had requested anonymity felt that the CLGs had not received the level of support that they needed from the STF and the Secretariat. Although, the problem was said to be about eighty percent social and twenty percent technical, the task force's allocation of resources failed to reflect this. Initially there was no community involvement plan in place and the person hired to do pure communications was to focus mainly on internal communications, rather than external communications with the community.

The volunteer process is based upon the idea that you cooperate and jointly plan with communities in order to gain their acceptance. Oddly enough there was no detailed plan for doing this. There were no established objectives, goals or understandings of what it would mean to work jointly

with communities. There was no framework to determine what needed to be accomplished, limitations of decision making and what to do with input. Instead there was a person assigned to each community who did administrative work for the CLGs and sent display boards and scheduled speakers. These people were not required to have a background in community relations.

This Secretariat member stated that the STF had not employed anyone who was known to be an expert in risk communications. This was thought to be odd, since for most communities, risk perception was thought to be the central issue underlying this problem. The second task force appointed consisted of one scientist, two engineers (one civil and one mining), an environmental lawyer, and a medical doctor. In the early part of the process, Audrey Armour who was the designer of the voluntary cooperative siting process was heavily involved but after she resigned in 1993, she was not replaced with someone who had a similar skill set. In addition, the staff was drastically weighted to the technical side. Of the seventeen full and part time staff on the secretariat, only one was working solely on the community side of the issue for the four communities in the process towards the end.

As time went on, the STF and the Secretariat began to acknowledge this and more resources were allocated to public involvement. There were three people assigned to do community relations, but, after some staff changes only one remained for the latter part of the process. In Phase three, local community facilitators were hired by the STF. They lived in the communities and became spokespersons. Unfortunately, control was sometimes lacking. In one case an individual who billed the STF Secretariat for 6 1/2 hours one New Years Eve was suspected of milking the process.

At times it appeared that the CLGs were being let down because it was thought that the real issues were not being adequately addressed. Communities complained that many questions went unaddressed. The types of questions that the communities had could not be dealt with by another bore hole or another engineering study. They were much more fundamental than that (ie. health and safety).

Highlights of Interview with **Dr. Audrey Armour** - June 22, 1995

The cooperative voluntary siting process as Dr. Armour designed it was to be very community focused. Her intention was that, in stage three that the CLG would work jointly with the task force on community involvement. In phase three, the STF attended all of the meetings as a group and the task force had a large presence in the community. Phase four, was to be the time to sort out the roles of the CLG and council and conduct impact management. Dr. Armour had envisioned that CLG would be directly involved in technical work by identifying impacts and guiding the technical process. She anticipated that the CLGs would sort through problems and assess options. The lines of communication between the STF and CLG were to be always open. Although, there was a legal agreement that only council could sign, it was expected that the agreement would go public for one last time before it would be signed off. Prior to very end stage it was to be full open process.

Dr. Armour felt that the hiatus between phase three and four caused a break in continuity. Not only was momentum lost, but the delay going into phase four and the funding cuts did further damage. Disbanding the original task force further complicated matters because it meant that the

STF couldn't go back to the CLG and talk about what happened. When the break in the process occurred, a new group of people joined the task force. Some time was lost as people were brought up to speed and tried to establish relationships with the communities. In addition, the communities had to adapt to a STF that did business in a different manner than the previous one. For example, Dr. Armour found that the new task force was less inclined to get very involved with the community and that the secretariat did not encourage them to do so. She felt that this was not in keeping with the principles of the process. The task force was to have been very community oriented. Instead, it appeared that the secretariat wanted to take the lead role.

The process became more bureaucratic. For example, the first task force had a chairman but this person's only extra duty was to be the designated media spokesperson. For the most part, decisions were made by consensus. On the new task force, the chairperson assumed a traditional role. This person worked closely with Secretary General in Ottawa. This resulting quasi-hierarchical organization, was more controlled by the secretariat than the first STF. With more decisions being made at the top it became more difficult to get a sense of what the community was thinking.

Initially the task force was structured to gather together the range of expertise that was thought to be necessary on task force. In phase four, one did not see the expertise reflected in the new task force and the secretariat. Additional people were subsequently brought in on contract to fill some of the void.

The referendum is not a decision making process yet, many felt that a failure to abide by the wishes of a community as directed by a referendum goes against the cooperative nature of the

process. Dr. Armour believed that a minimum of fifty percent support in a referendum would be required for the STF to go ahead to the next stage. However, according to the principles of the process, council has the right to decide what proportion they need.

Initially a community could volunteer to take a portion of the waste, although this was viewed as putting a proposal to the government instead of the other way around. Every community had the option of volunteering for a portion of the waste and it appeared that more than one community could be included.

When you make people partners, they assume responsibility, they feel the weight of the responsibility and it can be a lot on their shoulders. On account of town council having full control over many issues some basic survey rules were not met. For instance, in Deep River, they put a box in post office for people to vote. It was impossible to control the number of votes as there was no control to ensure validity of the vote.

Highlights of Interview with **Clifford MacIntosh** (STF member) - June, 1995

Clifford MacIntosh felt that some communities looked at the process as an economic development activity where receiving anything from the process would be worthwhile.

He believed that the job of the STF was to see whether or not the process could be used to find a location to site a LLRW management facility; the STF's job was to administer a process and see if the process could be effectively applied.

Clifford MacIntosh felt that the process was flawed. He felt that there should be more parameters on the process. For instance, he suggested that limits should have been placed upon the distance that the LLRW could be moved and the form of transportation that would be used. He also thought that everything necessary should be done in order to contain the waste where it is presently stored.

Mr. MacIntosh felt that the cooperative siting process was a very interesting concept but, he found that those who developed the concept tended to become too involved with trying to make it work, occasionally to the point of desperation. He found the process which was originally a fairly academic activity took on a life of its own. In real life however, no plan unfolds the way that you expect it to unfold. Clifford MacIntosh thought that the process should have been regularly evaluated to determine if it was still realistic and if not, how it should change.

He believed that genuine public involvement was not present. There seemed to be some kind of arrogance that people in the "boondocks" don't understand. He felt that there was not enough respect for input of local people. Too often, the STF appeared to be trying to neutralize objection rather than determining what people were really thinking. Meanwhile some communities got into war within themselves. Too much opposition in a community became an end in itself.

Clifford MacIntosh acknowledged the importance of local politics in this issue. He felt that political contact between the federal government and local government must be maintained. Some town councils want to have government to government contact.

When the break in the process occurred it was felt that the process should have undergone a full

critique to determine if the process was still a valid way to find a potential LLRW site. When the process resumed it was obvious that the Minister (of Natural Resources Canada) and supporter of the process, Jake Epp, was on his way out (retirement). This left the federal department supporting this process as leaderless. Naturally this had an effect on the process.

Clifford MacIntosh made two suggestions on how to improve the process. First, he suggested harnessing the people who are providing leadership. Second, he suggested that it would be helpful to have some studies such as those to do with technical issues, transportation and health done ahead of time so the process would not drag on as long. However, he acknowledged that this may be political'y impossible.

DISCUSSION

Introduction

Previous studies are comprised mainly of a series of distinct case studies focused primarily on the approach taken by the site selection committee. Several of these studies have validated the voluntarism approach presently under study in this thesis. Therefore, it was expected that this research project which also examined the volunteer siting approach, would further validate this model as the most effective. The fact that there is one community remaining in the siting process lends some measure of support to the voluntary siting process. However, having one choice is not ideal.

This study demonstrates that there are other factors which can play a role in siting LLRW facilities. By looking at a collection of community characteristics common to the longest surviving communities in a siting process, a typical profile emerged. This profile may make it possible to more accurately predict which communities are more likely to be interested in hosting a radioactive waste management facility and thus, allocate resources more effectively.

A series of nine hypotheses relating to community characteristics were tested to determine if the

communities who volunteered and remained in the siting process possessed a particular set of demographic variables such as low population, employment, and tourism levels and simple economies. Additional factors such as familiarity with science and technology, level of association with government, past experience with radioactive waste and waste siting processes and community perceptions and beliefs were also examined.

Two additional hypotheses relating to the design of the voluntary siting process were also tested to determine if voluntariness and control affected the acceptability of the siting process and longevity in the site selection process.

The final hypothesis examined the effect of the perception of risk. This factor has been repeatedly identified in the literature as being a key to a person's willingness to accept risks and therefore, become involved in so-called risky endeavours.

The results of the hypotheses testing were used to determine if communities participating in this siting process possessed a common profile. The hypotheses were examined individually at first and then collectively to see if trends were emerging. As the following discussion demonstrates, it was not one single community characteristic that appeared to make a community more likely to become involved in the siting process but rather, it was the identification of several key factors.

Additional information obtained through interviews and documentary evidence gathered from the six volunteer communities, two source communities, and several STF and STFS members enabled the researcher to compare key facets of this siting process with others reported in the literature.

Community impressions of the siting process gathered from all sources helped provide a preliminary data base on compensation and ethical considerations which should enable future researchers to develop hypotheses concerning the effects of compensation on siting and the role of ethical considerations.

In addition, to the case studies, a series of interviews carried out with four individuals from the administrative side of the process, including the originator of the voluntary siting process, were useful as a way of balancing the information gathered from the communities and obtaining a more accurate insight into the process.

Lastly, this discussion will conclude with some comments on the limitations of the research.

Hypotheses Testing

Testing of the first nine null hypotheses led to seven being rejected (numbers 1, 2, 3, 5, 6, 8, 9) and two being accepted (numbers 4, 7). A explanation of these findings follow a statement of each hypothesis:

1. Past experience with radioactive waste has no effect
upon the willingness of a community to consider hosting
a low-level radioactive waste management facility.

The null hypothesis was rejected because past experience with radioactive waste had an effect upon a community's willingness to consider hosting a LLRW management facility. Three of the

final four communities involved in the siting, Elliot Lake, Port Hope and Deep River, each have a history of handling radioactive wastes. Even more notable is that these three towns have had significant relationships to the "nuclear industry" when compared to almost all of the other 800 or so communities that were originally approached by the federal government to host a LLRW management facility. Certainly when one looks at the fourteen contenders identified in the beginning stages of this siting process, Elliot Lake, Port Hope and Deep River had closer ties to the nuclear industry than any of the other communities that withdrew from the process. Geraldton, unlike the other three communities, did not have direct ties to the nuclear industry. However, as future discussion will reveal, Geraldton had other unique characteristics which made it a nearly predictable candidate for volunteering to take part in the process.

The rejection of this hypothesis adds further support to the literature findings that familiarity with an issue tends to make people more comfortable and not so fearful and hostile (Sandman, 1986). Specifically it supports Greber and Barrados (1979) and Curd's (1988) findings that people who are familiar with nuclear technology have a reduced perception of risk associated with it.

2. High levels of past or present radioactive waste production have no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.

A similar argument as given above, is justified for the second proposition and the null hypothesis was rejected. Elliot Lake, Port Hope and Deep River have all been radioactive waste producers. It is interesting to note that Deep River and Port Hope as the final two contenders in the process,

not only host historic wastes but, they also plan to continue producing radioactive waste. In fact, both of these communities pursued the concept of co-disposal as part of a compensation plan. For communities creating ongoing waste, co-disposal is a great incentive to volunteer as a host community since it can solve a contentious waste issue. It can also increase the number of potential jobs created. One researcher found that very few jobs are created when ongoing waste is not part of a project (Tomsho, 1991). A LLRW waste management facility which is associated with a local industry producing LLRW is the best way to maximize job gains.

It made perfect sense that Port Hope would early on volunteer to take care of its own LLRW because traditionally attempts to care for LLRW at the point of generation often proceed smoothly. For example, nuclear power plants have expanded their capacity for storing fuel waste on their premises with very little public opposition (Erikson, 1990). Not only does familiarity decrease opposition but, also the transportation risk is minimized (Goldbaum et al., 1989).

3. Prior experience with waste facility siting has no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.

The null hypothesis was rejected for two reasons. It appears that waste facility siting has either a strongly negative or positive effect upon a community's willingness to host a LLRW management facility. Negative past experiences can cause a community to refuse to even consider hosting a facility. This was particularly true of two of the source communities. Clarington and Hope Township were both very unhappy with past waste siting practices and they consistently

refused to consider keeping their wastes and volunteering to assume wastes from other areas. Scarborough which had a small pocket of waste was also strongly anti-waste and did not become involved. This was expected since the historic LLRW in Scarborough had been at the centre of a very bitter battle in which residents fought for compensation after discovering that their homes had been built on an old LLRW site.

Even Port Hope at many points in the process showed reluctance to consider hosting a facility if it meant accepting other's wastes. Previously, Port Hope had experienced its share of poor waste management practices and this was an impediment to volunteering. However, Port Hope was distinct from the other three source communities because Port Hope had benefitted greatly over the years from the production of LLRW. In contrast, Clarington and Hope Township had served as waste sites only and thus, benefits were few and far between and for the most part detrimental effects were the result. The inhabitants of the Scarborough waste site area had also never received any benefits associated with the waste. Possibly even more significant was that Port Hope, unlike Clarington and Hope Township, did not have decommissioning orders on its waste sites. Regardless of how the siting process went, Clarington and Hope Township would not lose, as their waste sites would be cleaned up. This was not the case for Port Hope. As a result, many Port Hope residents felt that volunteering was their only hope to "clean up their town".

Elliot Lake's past experiences seemed to initially have a positive effect upon their willingness to be a host for a facility. They appeared to be more comfortable with LLRW. Some felt that there was little harm in taking on more of the same, especially since the volume of the waste in question was less than two percent of the volume of the mine tailings stored nearby that are known to contain radioactive elements.

Others in Elliot Lake expressed concerns similar to those voiced in Clarington and Hope Township. They felt that their own wastes had been so poorly handled in the past that they did not want anything to do with handling additional wastes.

Deep River, unlike the other source communities, has not had a major problem associated with the waste they presently house. Deep River's economy is highly dependent on the nuclear industry and thus, there were numerous reasons why they were interested in the project. Not only were they very familiar with the material, but, they also have a qualified labour force to manage it. This project may have represented a way to maintain good relations with the federal government (the primary employer in this town) and pay back the nuclear industry for the prosperity that it has given them.

Overall, it appears that those who have had previous experience with LLRW waste sitings are either more likely to progress in a siting process or if they have had had experiences with no associated benefits, they will reject it altogether. Communities which are more familiar with LLRW and where waste has been managed reasonably well seem to perceive the risk as less and are thus, less fearful of accepting more waste. An ethical issue appears to also be at play with Port Hope and Deep River who both felt some obligation for the waste (in Port Hope's case mostly only its own) after having reaped the benefits associated with the production of LLRW. These two communities frequently expressed a moral obligation to help in the clean-up.

4. Higher than average levels of unemployment have no effect on the willingness of a community to consider

hosting a low-level radioactive waste management facility.

Most surprisingly, the null hypothesis is accepted. The reason is quite simple. Although nearly all of the communities who volunteered to become host communities had recently experienced or were about to experience big employment losses, the wording of the hypothesis failed to measure this. This is because the most revealing measurement instrument was not chosen. Although only one of the six communities (Elliot Lake) had an unemployment rate above the national average, the actual number of employed workers had decreased in all communities except Port Hope (which had remained stable). The reason that this information was not revealed through the employment statistics was that the unemployed frequently relocated to other communities to look for jobs and therefore, did not become part of the unemployment statistics of their home towns. This information is corroborated later on when the hypothesis on population is discussed.

If the hypothesis had examined job growth or loss, there would have been a significant relationship. In all of the six communities studied with the exception of Port Hope, there were significant actual and/or expected job losses. In addition, four of the communities did not have any alternate plans to make up for the job losses. The fifth community, Elliot Lake was the only one with a plan to boost employment. In fact, the major reason why Elliot Lake dropped out of the process was that their new business initiative of developing a retirement community was starting to show some signs of success and LLRW management was thought to be in conflict with this project. It is interesting to note that Elliot Lake was the one community with a declining employment level and a higher than average level of unemployment. Elliot Lake may have felt more compelled to become involved in another major project (thus not making waste management

their only option) because more of their unemployed workers had not yet relocated. In future, when trying to determine who may be interested in siting a LLRW management facility it would be more revealing to determine if employment numbers are decreasing. If they are, the next step would be to determine whether a community has any alternate plans to boost falling employment levels.

5. A high percentage of government related jobs have no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.

The hypothesis was rejected, since two of the last three final contenders had a substantial amount of government related positions. The survival of Geraldton and Deep River depend heavily on government employment. If it had not been for Geraldton running out of time to do the necessary work by the project deadline, it may have continued in the process. Deep River as the only remaining community in the process is clearly a government town.

This leads one to question if these communities felt an obligation to become involved because this project is government sponsored. One document distributed by Deep River's CLG stated that many people are afraid to speak out even though they are opposed. They felt that the main criterion for selection had much more to do with finding the site of least political resistance rather than the site with the greatest physical suitability.

Volunteering to take part in a government project makes good sense politically. Deep River's

government employment is almost solely based upon the nuclear field (especially since the National Forestry Institute was shut down in 1995) which makes them even more vulnerable. In addition, as a producer of nuclear waste, Deep River's survival depends in part upon being able to manage its waste and thus, having a waste site is crucial to its maintenance.

6. Community economic complexity (single, dual or multi-industry communities) has no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.

This hypothesis was rejected because five out of the six communities focused on a limited number of economic enterprises. Only Port Hope had a varied economy and many of their reasons for participation had to do with the fact that they were a source community with little possibility of cleaning up their town without this process being a success.

It is very interesting that none of the province's metropolitan areas which tend to be economically diversified, participated in the process. Possibly, the economic diversity found in larger centres affords them a measure of security that smaller centres do not have. Further discussion of this will occur later on.

7. High levels of tourism have no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.

The relationship that was found was opposite to what was expected and the null hypothesis was accepted. Three of the six communities depend heavily on tourism. It is interesting that the two communities that do not rely on tourism, Hornepayne and the township of James, were the first to withdraw from the process and Port Hope was the last to withdraw. This was surprising because one would think that volunteering to host a waste management facility would discourage tourism. The reason likely is not because these towns wish to have more waste but, rather they are hoping for better management of the wastes they already have which could lead to improved tourism. Deep River (which is still involved) and Port Hope both viewed their positions as volunteers as something that could help ensure them of a solution to their waste problems. However, Elliot Lake which is known as the "jewel in the wilderness" cited a tourist related concern for withdrawing from the process. Elliot Lake's retirement living program is based upon affordable housing and an attractive location. It was felt that being in the waste management business would discourage seniors from relocating to Elliot Lake.

8. Previous experience in determining the consequences of high levels of science and technology has no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.

Since, three of the last four towns in the siting process had extensive experience in determining the consequences of high levels of science and technology, the null hypothesis was rejected. This makes sense because the perception of risk of LLRW would be expected to be less for those communities who have lived for years with it. The township of James and Hornepayne who dropped out of the process earlier on did not have experience with LLRW. Although Geraldton

also did not have the experience with LLRW, there were other factors at play.

It is also interesting to note that Deep River, which has the highest percentage of people with doctorate degrees in all of Canada, is planning to host a facility. It gives further validity to the theory that scientists are able to perceive risk quantitatively and thus don't suffer from many of the risk adverse sentiments so common to the general population. Several people interviewed in Deep River described two groups of people; there were those who did not understand the scientific aspects of the project and were for the most part opposed and there were those who had a good understanding of LLRW and were concerned that it was a waste of tax dollars to spend so much money shipping relatively benign material.

9. Low population levels have no effect on the willingness of a community to consider hosting a low-level radioactive waste management facility.

The null hypothesis is rejected since all six of the communities studied had low population levels. Both large and medium sized communities were completely absent from this siting exercise. Moreover, at the time that each of the communities were involved in the siting process, five of the six communities studied were concerned about decreasing populations. Even Port Hope which had the highest population of the six communities indicated that their population had been static. They complained that they had not experienced the growth that they expected considering their close vicinity to a major metropolitan centre (Toronto) and comparing themselves to nearby areas. They felt that the LLRW had discouraged development in their town.

This project attracted only communities with small populations who were not located in, or attached to large urban centres. The reasons for this could be two-fold. First, not only is it easier to gain consensus with a smaller group, but, homogeneity is more likely in a small centre. Second, formal opposition is often reduced since, environmental groups are less likely to have headquarters in small towns. In this study the only environmental groups that caused any real opposition were two newly formed groups that sprung up in response to the project (CARD and STOP), and one of the two was started by someone from outside of the volunteer host community.

A smaller centre is also less likely to have a diverse set of economic opportunities. Low community economic diversity which was common to five of the six volunteer host communities (Port Hope was the exception) makes a town more vulnerable and less recession proof. Nearly all of those communities that participated had recently lost or anticipated losing a key business and were looking for other opportunities to both stop the flow of people leaving their community and to provide more jobs and revenue. A LLRW management facility was seen to be a way of providing this.

10. Voluntarism has no effect on the willingness of a community to host a low-level radioactive waste management facility.

The null hypothesis is rejected as there was very clear evidence from both interviews and documentary evidence that the six volunteer communities supported the voluntary siting process. In fact, there was resounding support for the voluntary process. Communities stated that they were far more willing to become involved because there was always a chance to drop out if the

community became opposed to the idea. Without the volunteer process, those in charge of the process may have had a hard time gaining access to the communities so that they could fully explain how things would work and enable some of the community's fears to be relieved.

11. The ability to control the process has no effect
on the willingness of a community to host a low-level
radioactive waste management facility.

The null hypothesis was rejected. Local control had a strong impact on local reaction. The control aspect is one facet of the voluntary process that was embraced by all the communities. This factor was in keeping with numerous public opinion studies which have shown that the ability of a community to monitor a facility, to participate in its management and to shut it down if necessary has a great impact on local acceptance; possibly more than any other measure - considerably greater than financial compensation for example (Bord, 1987, Davis, 1986, Susskind, 1985, Colgazier et al., 1986).

Having control enabled communities to better accept risks and provided a safety net as the community could veto or endorse decisions made by the STF as well as putting forward their own.

After Deep River's CLG resigned some individuals questioned where control really rested. Was it with the STF, AECL, town council, the government or else all of them? The correspondingly low level of community involvement and increasing level of council involvement was a matter of concern. This seemed to cause scepticism and distrust with some community members.

However, the referendum provided support for the STF to go ahead with the last phase of the process. The positive vote however, may be attributed to many factors including the compensation package which provided job security for those working at AECL until 2010. This was particularly important since AECL is crucial to Deep River's economic survival and there had been many recent layoffs and a big one planned for the near future.

12. The nature of the perception of risk (including health and safety and environmental concerns) has no effect on the willingness of a community to host a low-level radioactive waste management facility.

The null hypothesis was rejected. The literature indicates that most negative reactions to radioactive waste siting can be explained by looking at the way people perceive risk. This was confirmed. Risk emerged as the top of mind concern for all the communities. Radioactive waste is notorious for bringing out feelings of doom and gloom. In another example Lee et al., (1985) found that forty-six percent of those interviewed about an engineered site for LLRW felt that it was likely that something would go seriously wrong within fifty years.

Those communities which were more comfortable with the risk, perceived it as less threatening and were more likely to accept it. Deep River is a perfect example of this. The culture of Deep River is not strongly adverse to LLRW facilities. They also have the highest proportion of people employed in the nuclear field and not surprisingly are still involved in the process. They do not see these structures as feared monsters. It appears that we are less likely to dread that which we know. In addition, Deep River's expertise in handling LLRW allows them to have a high degree

of trust in their institutions to handle the waste.

An alternate and/or additional way of looking at the Deep River situation is that because the proposed location for a facility is situated on government property which is located at the southern most tip of the municipality away from the populated area, the residents may feel that they do not have a high personal stake in the siting of a facility. Afterall, it should pose minimal risk to the community since the proposed site is down river and down wind from Deep River. This confirms the literature findings which have demonstrated that people have been shown to be less concerned about risks to unidentifiable victims (Slovic et al., 1980, van der Plight, 1985, Covello, 1983)

Overall, it appears that communities that already have so called "risky" facilities tend to have local cultures that accept such risks and often are willing to accept even more risks. Some recent Canadian examples of where this is holding true have been demonstrated in Pinawa, Manitoba (home of Canada's Whiteshell Nuclear Research Laboratories), where local government volunteered to host a trial high level waste facility and in Swan Hills, Alberta, a community with major oil and gas industry experience who volunteered to host Alberta's hazardous waste facility.

When you look at the hypotheses in entirety, the six volunteer host communities possessed many common characteristics which form a pattern. In this study, the type of community that volunteered was a relatively small community (less than 20,000 people) which was likely to be experiencing a decrease in population, and in particular a decrease in the number of employed persons. The economies were based upon a limited number of businesses and it would not be surprising if the community had strong government ties to whichever government was carrying out the siting exercise. Past or present radioactive waste production appeared to lead to greater

participation as it helped combat the risk perception issue and fulfil ethical obligations. Previous experience in determining the consequences of technology and handling of radioactive waste also made it more likely that a community would remain in the siting process.

The above sketch of a community more likely to become and stay involved in a siting for a LLRW management facility must be used with caution. The merits of a more direct approach which the above could provide are obvious. In times of financial restraint anything that can shorten the siting process and make it more efficient and economical is a definite advantage. The problem is the question of whether it is ethical to use such a process. Siting agencies may be accused of being prejudiced if they were to seek out communities with a certain profile. It could also mean that some communities may be overlooked.

Potential Host Communities' Issues

While obtaining data to test the above hypotheses, the researcher also gathered information about the siting process. This additional insight into the siting process provided the researcher with an opportunity to confirm previous recommendations and make some additional ones as well. Through both interviews and documentary material, communities expressed many reasons for their involvement or lack thereof. They also gave their opinions on many siting related issues and made numerous suggestions which could be utilized when future siting processes are structured. The following discussion which parallels the literature review where possible is also supplemented with documentary evidence gathered from two source communities which did not volunteer to be host communities. More detailed information may be found in the case studies in the appendix.

Motives for Involvement

Support for the voluntary siting process was cited by all six communities as a reason for becoming involved. The voluntary nature of the process gave the communities a sense of control that greatly minimized the risk they felt and provided them with the ultimate control; an opportunity to withdraw at any time. Meanwhile, the STF benefited as they had the opportunity to present their ideas in a non-threatening atmosphere and to work through the process in a non-adversarial way.

The three communities with prior LLRW experience said that they saw the process as a way of sharing their knowledge and ensuring proper disposal of their local waste. They also hoped to gain either a co-disposal agreement or in the case of Elliot Lake, better management of their existing mine tailings.

The township of James, Hornepayne, Elliot Lake and Geraldton saw the process as a way to gain information and expertise in LLRW management. All communities except for Port Hope which has the most broadly based economy saw this project as a way to improve and/or diversify their economies and create jobs. With the exception of James township and Port Hope, the rest of the communities cited recent or expected job losses.

Not surprising was that the two communities with a high component of government workers, Geraldton and Deep River, gave as one of their reasons for involvement that there was minimal public opposition. Both towns seemed reluctant to bite the hand that fed them. Geraldton's

withdrawal from the process due to a lack of time to complete the process was coached with accolades for the process.

Involvement Patterns

Assessing mayoral support for the process was a bit confusing because municipal elections occurred throughout the project's timeframe. In particular, municipal elections held in November of 1994, resulted in many new mayors and different attitudes towards the process (detailed descriptions can be found in the case studies in the appendixes). At one point or another, all of the communities had some mayoral support. However, Elliot Lake's mayoral support was short lived. A post-election change of mayor and a blossoming of the retirement living program quashed that. In contrast, Port Hope had active mayoral opposition initially but, council forged ahead. After their municipal election in the fall of 1994, a new mayor pledged support for the process. In Hornepayne, Elliot Lake and Deep River there was minimal political involvement until major decision points. This makes sense in the case of Elliot Lake as support for this process could be seen as endorsing this project over the retirement living program which was seen as being uncomplimentary with LLRW. In Deep River, the mayor during much of the process may have not wanted to be seen as overly involved as he could be considered to be unbiased considering who his employer was (AECL).

It came as no surprise that all of the communities felt that there was minor public involvement until major decision points - how very Canadian. One only has to look at the recent fiasco with the Quebec referendum in late October 1995, to predict the lack of involvement by politicians and the public until the eleventh hour. Four of the six communities complained that they were tired

of discussing the issue. Deep River as the one remaining community in the process was not one of the complainers.

The final two contenders in the process, Port Hope and Deep River were the only two communities where organized opposition groups did not play a role in the process. This was found earlier to be a factor in determining who will not take part in a volunteer process.

Environmental Suitability

Continuing as a volunteer is hinged upon having available land to locate a facility; something which all but one of the communities were in possession of. Although Geraldton had some concerns about Indian land cautions, they participated in the process while hoping to gain access to land. However, failure to secure a suitable parcel of land in time to carry out the required siting work eventually drove Geraldton out of the process. It was significant that three of the four final communities had infrastructure in place that could prove useful for a LLRW facility.

All the communities except Elliot Lake expressed concerns about different types of water contamination. Elliot Lake may have been the exception because people recognized that the waste volumes they were discussing were so much less than what they have already lived with. Furthermore, Elliot Lake assumed that future LLRW would be disposed well out of town. Considering the overwhelming general concern about water quality, this topic should be an area which STF members should be well versed in so that concerns can be properly addressed when they emerge.

The township of James and Deep River both voiced concerns about the safeness of a LLRW facility given their concerns about their soil and seismicity. Like the water issue, these issues need to be well explained. A significant problem in regards to seismicity which occurred during the siting taught a very important lesson to officials setting criteria for siting exercises. Initially seismicity was a reason to disqualify a community from participation. When this was later rescinded many angry people in Deep River felt that criteria were being altered to suit the situation, thus undermining safety and trust. Deep River also had concerns about their geology because it was thought that leaching could occur. It was obvious to all, that Deep River's geology is not ideal especially when compared to Port Hope's geology.

Deep River remained in the process in spite of the fact that they expressed the most concerns over their environmental suitability. This suggests that physical limitations are not the pivotal factor in this siting; rather social, political and psychological reasons are.

Opposition

Opposition was not based primarily on an anti-nuclear movement or a NIMBY attitude as identified in the literature review. Although four of the six communities (James, Elliot Lake, Geraldton and Port Hope) confessed to having a somewhat "NIMBY" attitude, this did not seem to be a predominant theme particularly since the participants in this study had volunteered to take part. Most likely the NIMBY types were more heavily represented among the group who did not volunteer. Anti-nuclear types were not very prevalent either and this was probably for a similar reason. In addition, because the volunteer communities were so small, it could mean that there would be less chance of there being an active environmental group in the town's domain.

Nonetheless, opposition was alive and well. People were not anti-nuclear per se but, they did have many concerns directed primarily to the siting of a facility rather than the siting process. People voiced a multitude of concerns but, a fear of the waste contents both from a chemical and a radiological point of view topped the list. The four final communities also voiced uncertainty about the waste contents and they questioned if the waste was solely low-level. A common fear was that some high-level waste would be included. This relates to the trust issue which will be discussed later on

Overall concerns about health and safety were voiced in all communities except Deep River which is probably the most comfortable about accepting the waste as they had previously accepted a great deal of Port Hope's wastes years ago after a clean-up. Although the STF and the Secretariat staff assured the communities of the safety of the project, many were sceptical and rightly so. The actual evidence does not provide resounding support. On account of LLRW being a relatively new substance and the fact that some of it is very long lived, requires that risk assessors make scores of subjective judgements from inconclusive data (Keller, 1992). It will be a long time before conclusive data is in. The uncertainty in risk assessment surrounding LLRW makes people nervous. As a result it is virtually impossible to know for sure the impacts of a planned but unbuilt facility, especially when using a new technology. Unfortunately, history provides little reassurance. Although a new facility would be built to today's standards, so were many of those in the past.

The siting task force chairman Dennis Wood stated that health risks were recognized early on as a matter of considerable interest and concern. He admitted that the STF cannot quantify what, if any, real risks may be involved with a Deep River facility, because they did not yet have the

information they needed. Additional information about specific health risks could only be provided through a performance assessment of the proposed facility, something that was not yet completed. A specialist in risk communication was expected to be a part of the performance assessment team. This seems to be too little too late. It is possible that if a risk communication expert had been part of the process earlier on, that the government may not have been in a position of having only one potential host community. It is ironic that Deep River, which was the community least in need of a risk perception specialist should in the end be the only community to have one engaged on their behalf.

All communities except Port Hope (for obvious reasons) had great concerns about the transportation distance and traffic level that would result if they hosted a facility. Many feared that the extensive distances and the number of trucks and/or trains required would make it statistically very likely that accidents would occur.

All communities had concerns about how this project would affect tourism as it was felt that LLRW might discourage some people from viewing their community as a tourist destination. This concern was particularly strong in Elliot Lake which claims that they are known as the "jewel in the wilderness". Elliot Lake recently developed a retirement living program and they feared that even being part of the siting process would prevent people from moving to the area and thereby kill this new business opportunity which they had high hopes for. In addition, some people already present in the community were threatening to relocate if the project went ahead. This also occurred in Hornepayne and the township of James. It is not surprising that nearly all the communities had concerns that their property values may decline. Although the Canadian evidence cited in the literature review indicates no negative effects, people find it difficult to

ignore the threats of people planning to leave their communities and they wonder what effect it might have on their property values

Three of the communities - James, Deep River and Elliot Lake were afraid of gaining a bad reputation because of this project. The township of James and Deep River received negative press from those living in nearby communities. Documentary evidence revealed that in Elliot Lake and the township of James that there appeared to be a negative media bias against the project. It is well known that the media is a persuasive vehicle for affecting public opinion. Public information programs sometimes fail because of the filtering effect of the media. This is amplified in towns where the local paper or radio station is already anti-nuclear. Therefore, it is not surprising that two of the three first communities to withdraw from the project were subject to this. For the most part the STF kept the media well informed which minimized potential negative press.

This project's incompatibility with Elliot Lake's other plans made Elliot Lake very nervous about being in the process. Overall, the cost of being in the project just seemed too high especially since it was estimated that few permanent jobs would be created. In fact, all communities except Deep River expressed concern about the minimal number of permanent jobs that would be created. Siting task forces should not rely heavily on this "carrot" as a way of inducing communities to host a facility as it is a small one indeed.

For the most part the opposition which occurred could have been predicted from the literature. Audrey Armour's (1990) identification of three factors responsible for adverse reactions held true. She determined that attitudes, perceptions and socioeconomic characteristics determine how positively or negatively a community will react. As the hypotheses have shown, this was certainly

true. Societal trends such as a declining faith in governments and institutions were such a significant factor that they will be discussed separately under its own heading. An increased concern over public health and safety was also identified by Armour (1990) and this was confirmed by the communities as a key reason for opposition. The third factor which was confirmed by the communities' comments, was that the facility might be deemed a locally undesirable land use because of potential negative impacts and a perceived unfair distribution of costs and benefits. There were many concerns that a LLRW management facility could affect tourism and nearby property values. As mentioned previously, Elliot Lake withdrew because they believed that hosting a facility would mean the death knell for their blossoming retirement community which they were hoping would be the financial saviour of their town.

Declining Faith in Governments and Institutions

Communities expressed a variety of reasons for a declining faith in government and institutions. For example, the reservation of the three communities currently housing some LLRW (Elliot Lake, Port Hope and Deep River) were based upon previous experiences dealing with the LLRW and the government.

All communities except Port Hope and Deep River suspected that funding would be inadequate for the whole project. This concern was inevitable since funding for the siting process was discontinued at one point. When funding was reinstated, it was with a reduced budget. Two communities (James and Hornepayne) also indicated that they felt that funding following decommissioning would be insufficient. Documentary evidence from the township of James revealed that they had doubts that the government would honour their compensation commitment.

It is interesting that neither interviews or documentary evidence indicated that Port Hope and Deep River had concerns that there could not be enough funding to run the process, even though both communities were upset when funding for their CLG offices was suspended. Possibly, these communities' beliefs that the funding for the process would continue provided them with a reassurance to continue in the process.

Port Hope and Deep River indicated that their confidence had been affected when the STF changed some of the siting guidelines such as changing the environmental elimination criteria. This change allowed Deep River as part of a cluster of volunteering communities to continue on its own in the process. This greatly upset the neighbouring communities which had been part of the coalition and who would now have the inconvenience of having a LLRW facility nearby without the benefits afforded a host community (recall that the chosen Deep River site is closer to the town of Chalk River than the town of Deep River). Another change which caused dissension was the provision that the process could continue if council so directed even if there was a negative referendum result. Changing rules midstream supplied dangerous ammunition to those people who were against a project. Extreme care must be taken to ensure that excellent guidelines are initially provided and if changes occur, that they be done jointly and in an open manner. It would have been prudent for the STF to tell the communities up front, that on account of this being a relatively new process that the occasional change may be necessary. Unfortunately the manner in which changes were made appeared sneaky. It also looked like the process was being changed to suit the circumstances in order that the maximum number of communities would remain in the process.

Only Hornepayne mentioned that they had a low level of confidence in opposing scientific views.

Part of the siting process involved bringing a variety of speakers to the communities to talk about LLRW so informed choices could be made. Many divergent views on the handling of LLRW were presented. This may have been confusing for a community unfamiliar with LLRW. Hornepayne, Elliot Lake and Geraldton voiced doubts about the safety of any facility that may be built.

All six communities were nervous that if they agreed to host a LLRW that it could mean additional obligations beyond those indicated for this project. The township of James, Hornepayne, Port Hope and Deep River were also concerned that their involvement in the process could culminate with them being forced to take a facility if there were no volunteers remaining at the conclusion of the process. After all, a site was needed and as a result of participation in the process, the government had already completed some of the ground work required to build a facility. In the same vein, all except Port Hope suspected that they would be required to handle ongoing wastes on account of having a facility. The township of James, Hornepayne, Geraldton and Deep River were concerned that if they became a host facility that they would also have to assume an extra volume of waste and that they would have to handle some high level waste as well.

The aforementioned concerns persisted throughout the siting process. These reactions appear to indicate that the mistrusting relationship between the government and the people makes it very difficult for communities to feel secure enough to take the government at its word. To help combat these it may be advisable for those carrying out the siting process to provide a contract for the volunteering communities which could be used to guarantee them adequate compensation for additional obligations.

Concerns of Potentially Affected Communities

Many of the concerns of potentially affected communities (those communities who would be expected to be affected by a facility), are similar to those of the volunteer communities. Communities which would be affected if Port Hope and Deep River hosted a facility had concerns about transportation effects and health and safety. Communities on route to Geraldton also had concerns about transportation. Geraldton's and Deep River's neighbouring communities feared negative effects on their tourist industries.

When the STF changed the rules that allowed Deep River to volunteer on their own (after being part of a coalition of four communities) because the AECL property under consideration as a potential site was within their municipal boundaries, they disregarded the fact that residents of Chalk River, and the Townships of Rolph Buchanan Wylie and McKay are closer to the proposed site area and are therefore most effected. This is in violation of the voluntary process' principal of compensating those who are neighbouring the site and/or who would be most affected. Obviously, this unethical situation strained relations between Deep River and the surrounding communities. The Township of James and Port Hope also reported an increase in tension with neighbouring communities. This is inevitable as surrounding communities have very little opportunity for compensation if losses were to occur. In fact, the neighbouring communities would in a sense be subsidizing the waste generators through the host communities. There could be property value losses or even psychic costs like increased mental anguish. Communities around Deep River and the Township of James not only requested compensation but they also wanted to have input into decision making and voting rights.

Overall, it is important that the negative externalities (effects that continue for many years) that may not be felt for more internalized by the appropriate party so that uncompensated site neighbours and future generations are not subsidizing the project. Not only is this fairer but also, economic efficiency is increased when communities internalize the external costs of these facilities (Gerrard, 1994).

Impact Management

When siting a LLRW facility in a community, you are concentrating costs within an area while providing benefits to a larger area. Negotiated settlements must address the issues of perceived risk, trust, control and inequities in the distribution of costs and benefits. Mitigation is the means by which risks to the host community including social, psychological, environmental and financial risks are addressed. Compensation helps to induce a community to accept a facility and its primary purpose is to compensate those who are accepting the inconvenience of hosting a facility. For those who do join the process, compensation can be used as a method of making "victims" whole.

It is very tricky to manage a compensation package yet, it is so important to a relationship of trust that it be done fairly. The local community must be represented at every stage so that benefits to local people can be maximized and disadvantages minimized. It is also important that there are enough resources to carry through with compensation/incentive schemes even if they are very expensive. Deep River's recent indications of retreat based upon the federal government's predicted job cuts in the Chalk River Laboratories demonstrate the importance of supporting compensation agreements. Careful budgeting must be observed by the proponent. The proponent

may also have to supply funds to ensure that a community has the necessary resources to be competent and effectively involved. Supplying funding and/or administrative assistance early in the process will allow the community to hire the technical assistance they need to study and comment on the proponent's plans.

Although compensation is an incentive for involvement it alone is not sufficient to engage a reluctant community into the process if they did not possess a community culture that could accept this type of project. Compensation works only when the community does not believe the proposed facility poses an undue hazard. For example, opposition to LLRW facilities stems mainly from a concern over an impact on health, particularly children's health and there is no amount of money that will induce people to endanger their children (Gerrard, 1989). If these facilities are viewed as dangerous, being offered money will seem like bribery.

All of the communities, except Deep River stated that compensation was a key factor for involvement. Considering that Deep River is the one remaining community in the process, one may then assume that in this instance, compensation is not enough to induce one to take a facility. However, just because Deep River did not cite compensation as a key factor does not mean that it did not act as an inducement. If a community is already amenable to LLRW management facilities, they may be made even more so by the offer of compensation. It would be very surprising indeed if the rich compensation package negotiated in Deep River had not helped swing the referendum vote in favour of hosting a facility. Also coming as no surprise is that Deep River is now reconsidering their voluntary status on account of recently announced job cuts at the Chalk River Laboratories (the communities' primary employer). Job security was to be a key compensation issue for Deep River.

A couple of communities (Hornepayne and Elliot Lake) indicated that they would prefer the discussion about compensation to occur earlier. That way they would know if the project was worth their while or not. The township of James and Hornepayne suspected that any compensation offered would be inadequate. Considering they felt that way it is not surprising that they were the first two of the final six to withdraw from the process.

Port Hope and Deep River expressed concern about the CLG's minimal role in the compensation issue. The voluntary siting process relies heavily on the involvement of a CLG to work with the STF and liaise with the community. However, in stage four, compensation negotiations are carried out with the communities' elected officials instead of the CLG and it is town council's prerogative whether they wish to include the CLG or other members of the community in those negotiations. In this study, Port Hope and Deep River councils did not allow CLG members and/or members of the community to take part in the negotiations. Naturally, the CLGs who had invested so much time and effort in the process were disappointed.

If this study is indicative of how the CLGs will react to the compensation issue, it would be advisable to have a more formal mechanism to gather their opinions or else make it completely clear that their input will not be requested on this issue. If the latter is chosen, then the CLG can no longer be regarded as a legitimate partner in the process and the voluntary process will no longer be truly community orientated. By not involving the community as much as they desire, the opportunity is lost to increase familiarity, decrease fears and lower risk perception. These factors lessen the likelihood that a community will remain committed to the process.

Overall, compensation was not viewed as a bribe as communities felt that they would be doing

the rest of the province a favour by taking this project and thus, should be compensated for it. The scepticism about adequate compensation and the desire to have things more up front should probably be addressed. It would also help if the STF could obtain guarantees from the government concerning how rich the compensation package could be. As one mayor said "it is bad business practice to get into a deal when you don't know what is in it for you".

Compensation must be adequate. However, it is very difficult to quantify the externalities from LLRW management facilities. Without compensation, the protection of the communities lies with the political system which is quite sensitive to psychic issues particularly if the media has shown an interest in them. However, if psychological costs are recognized with compensation by forcing the market to recognize the social costs of LLRW, a more efficient use of the products associated with LLRW may result.

Probably the most significant impact from such a facility would be emotional anguish suffered by both the host and the neighbours of planned facilities. Greber and Anderson (1989) proposed that psychological impacts be considered in the siting process as time and time again this is mentioned as a health risk. The problem is how do you determine an appropriate level of compensation for fear if it doesn't result in physical ailments. It is just so subjective.

Ethics

When determining an ethical framework, it is helpful to review the basics of two dominant ethical systems - egalitarian and utilitarian ethics. The egalitarian system focuses primarily on the way in which decisions are developed under the premise that justice will be achieved by fair

procedures directed towards individuals rather than focusing on society at large. In contrast, utilitarianism focuses on the outcomes of those decisions and tends to emphasize the quantitative aspects. Unlike an egalitarian system, this approach would be unable to appreciate mental anguish as a risk factor because it is not quantifiable. The emphasis of utilitarian philosophy is to serve society at large.

In the past, most siting activities have tended to be along utilitarian lines. Sittings were devised to minimize risk for people and the environment with the greatest efficiency (lowest risk at lowest cost). Public outcry has led to the adoption of some egalitarian principles which appreciate individual rights.

A major part of an ethical framework is fairness which leads to justice being served. Fairness has elements of both burden allocation and process. It is unfair to allocate the burden unequally or reach that allocation through a closed process. If people do not feel that these burdens have been fairly allocated, appealing to them with a utilitarian approach will never convince them that they should bear these burdens.

The siting approach used by the STF for the voluntary siting process meets egalitarian goals by using a volunteering model under an open process and imposing facilities only on willing communities. Meanwhile utilitarian goals are achieved by providing a waste disposal facility in an acceptable location. However, due to the long life of LLRW and the high degree of uncertainty in risk assessment, future generations who are powerless may end up subsidising the current generation.

Some residents spoke specifically about the safety of their children and grandchildren. As mentioned previously all six potential volunteer host communities had some reservations concerning the safety of the material and how it would affect future generations. This like the concern for risks affecting children is an example of distributional equity which is frequently guided by a moral concern for those who do not have a say in decisions that could affect them (Kunreuther et al., 1989). This predominantly ethical issue is of paramount importance to communities. Therefore, a STF should be prepared to fully discuss it. There is a need for a model that can delineate responsibilities for projects whose negative effects last beyond their benefit period.

For the greatest level of safety and fairness to future generations, facilities should be placed in the technically best locations to minimize health and environmental impacts. In a utilitarian focus, areas with a low population density would be preferred as it would mean that fewer people are exposed to the risk. However, this would be incompatible with an egalitarian focus since it would mean that remote locations would be more apt to be selected as sites (Gerrard, 1994). Fortunately, in this study the final community, Deep River, struck a reasonable balance between these two ethical systems.

Although compensation was assured, details were not revealed. Bringing compensation out in the open may take advantage of depressed communities who may be anxious to gain any source of income generation possible. Some communities looked at the process as an economic development activity where receiving anything from the process would be worthwhile. Even involvement early in the process brought revenue into the community as visiting officials required food and lodging.

Early disclosure of compensation which results in economically depressed communities applying could lead to accusations of discrimination. For example, the six final communities under study could all be described as vulnerable in one area or another (ie. location, little economic growth potential). One wonders how things would have looked if Geraldton had been the only remaining community left in the process rather than Deep River which has a very educated, prosperous workforce. Although the siting process under study is a voluntary process, there surely would have been cries of discrimination.

Relating in part to the North/South conflict, there was an opinion raised by the township of James, Hornepayne and Deep River that depressed communities are vulnerable targets for siting. Obviously, moral problems are amplified when a group is vulnerable. This ethical issue is one which requires further research. In the case of this study all the volunteer communities were economically vulnerable except Port Hope.

On the other hand, this is a voluntary process. One must ask, if it is ethical to prevent communities from volunteering to take part in a project, considering that they may gain those things that they need (through a compensation package), especially if it may guarantee better health than any damage that would be caused by LLRW.

To achieve regional fairness, the benefits and burdens of LLRW should be correlated; no place should bear a disproportionate share of the region's hazards (they will if both production and waste management are at same locations) (Gerrard, 1994). However, all communities with the exception of Hornepayne stated that those who produce waste should manage it. The STF should remind people that this particular siting is unique in that it deals with historic waste which the

original producer can no longer reasonably be held accountable and that in future, wastes will be the responsibility of the producer (Ontario's new omnibus bill may change this). This would help to alleviate fears of having to handle ongoing and additional wastes.

Some residents in the three towns which have waste sites (Elliot Lake, Port Hope and Deep River), expressed the opinion that they felt that they have already done their share hosting LLRW. This may be so but, they were also the main recipients of the benefits associated with the production of the waste. It may be a matter of balancing costs against the benefits. The trouble with LLRW is that its long life makes the costs difficult to calculate.

Three of the four northern volunteer communities were concerned that the North was being targeted as the South's dumping grounds. In this siting only one southern community was involved and they only volunteered after it looked like the process would fail. The lack of southern communities in the process when it is well known that most of the benefits from the production of these wastes were gained in the south, can cause resentment and be perceived as unjust.

Three of the final four communities believed that taking the waste was their way of doing their part for the betterment of society as a whole. It is interesting that Elliot Lake, Geraldton and Deep River should all possess this utilitarian attitude. Perhaps, this is another key to the process; that is, to find someone with a utilitarian attitude. Deep River was especially inclined to feel this way which is not unexpected since they have benefitted so much from the collective taxes of the province and country. The sentiment displayed may go beyond utilitarianism to that of repaying a debt to society for supporting their community. It came as no surprise that Port Hope did not

have this orientation. Instead they felt that they had been burdened for years with the storage of this waste.

The problem with trying to reconcile the utilitarian and egalitarian ethical system is that it would be coincidental (and fortunate!) if volunteering communities possessed favourable geology and other physical conditions. Equity problems can arise if low-income communities are more prone to volunteering and the borders of the relevant community are difficult to define and people beyond object.

The question of whether this project would perpetuate the production of LLRW was only brought up as an issue in the Township of James where residents had basic concerns about waste production and reduction. Possibly the low frequency of this concern was because the purpose of this project was to house historic waste which should have no relation to waste to be created in the future. Hopefully, the reason is not that Canadians are so accustomed to dealing with our waste after the fact that we have become complacent about finding ways to reduce it.

The best and most ethical way to protect future generations is to not produce LLRW until scientists can be fairly certain that no latent effects will be felt. Since all disposal costs will not be fully borne by this generation, it is less likely that the costs of disposal will lead to the development of waste reducing production techniques which is the most ethical approach. A lack of concern for future generations is unjust and leads one to question whether the waste byproduct of our consumer society is morally justified.

Having the government pick up the tab for this project runs the risk of sending the message to

other LLRW producers that the government will assume further waste management costs. This is amplified by the recent philosophy of the provincial government which places less responsibility on the producers. For example, the Ontario's new omnibus bill which has removed the requirement for mining companies to remediate sites. However, this project will have a partial accounting of costs including a compensation package which can help in determining the full social costs. Hopefully, the predictably high costs should encourage officials to minimize waste by removing all subsidies for waste generation.

All the communities except the township of James mentioned that it would be fiscally irresponsible to ship the waste far distances. Most likely the township of James neglected to mention this because they were the first to withdraw from the process and most likely were not that involved with the transportation estimates. Some communities described it as a waste of taxpayer's money. Documentary and interview information revealed that many people in Deep River and especially those familiar with LLRW, felt that the material was not very dangerous and that moving it would create a greater danger than leaving it alone. The perception in Deep River was that wastes could be safely stored in or near the originating community that has received the benefit of the activity leading to their generation and that transportation from the present location to Deep River would be excessively costly. They also commented that it would inject an additional unnecessary hazard into the ultimate disposal process. If they are correct, the question then becomes an issue of whether it is more ethical to follow the advice of the "experts" or should popular opinion be respected. However, the voluntary process was set up to give the public control and to get away from the approach of having the experts make all the decisions which has proven to be a failure.

Petitions/Referendums

Documentary evidence revealed that all except Port Hope had petitions circulating opposing the siting of a LLRW management facility. Port Hope's immunity may have been due to the fact that the town's greatest opponent to its LLRW was a member of the CLG and working towards having it safely managed. Harnessing the anti-nuclear types is politically very wise and helps to better protect the public interests.

When the Township of James held a referendum earlier in the process than the STF recommended (before all the relevant information had been gathered and a compensation package defined), it came as no surprise to the STF that the vote was negative. In contrast, Deep River, held the referendum after the compensation package had been decided and it was successful. Discussions with community members prior to the settlement of the compensation package and the referendum suggested that the referendum vote would be negative. Although these discussions in no way comprised a representative sample, it makes one wonder if the generous compensation package negotiated by Deep River was instrumental in the government gaining a mandate to continue.

Siting Process Concerns

All of the communities with the exception of Elliot Lake and Geraldton thought that the process was too flexible and all except Elliot Lake found the process too time consuming. The great flexibility in the process made it easier for public needs to be accommodated but, it also slowed the process down and caused it to drag on. This can cause a problem since the public involvement stage come towards the end of the process. For example it is more difficult to gain

people's involvement if they have become tired of discussing an issue.

The communities that found the process too flexible also stated that they felt that the local CLGs became too involved in the technical side of the process. It was suggested that in future it would be preferable if the communities' involvement in technical aspects of the project be carried out under stricter technical guidance and be less extensive. Too much time was wasted by over-involving the CLGs (who were sometimes starting from scratch trying to gain knowledge of the issue) in technical issues.

The three final communities and the two source communities were concerned about how expensive the process was and at times they questioned how the money was spent. One of the reasons that the process was so expensive was that it was so wide open. If there had been restrictions applied, such as limiting the distance from the waste source that one must be in order to volunteer, costs could have been reduced. In future, more structure and guidance should be provided.

Documentary evidence from Hornepayne and Port Hope revealed that they found that roles and responsibilities were ambiguous. In Port Hope this was particularly apparent during the time when technical issues and compensation were being discussed. The CLG was quite confused about its role. A STF should carefully delineate roles and responsibilities and take care not to change them as the process progresses.

There were concerns over the way that information was delivered. Some communities (Hornepayne, Geraldton, Deep River) even felt that information was being withheld from them.

For the most part, these suspicions centred around health and safety issues. Deep River and Port Hope also felt that the STF took too long to respond to their questions and that when the responses came they were too indefinite. In particular, communities were unhappy that it took so long to get a health effects study. The continual delays led some to believe that it was being rewritten because the STF was unhappy with what they had discovered. In addition, the fact that the study came much later than the promised date caused some credibility problems.

A major concern that came out of interviews and documentary evidence from the Township of James. Hornepayne and Deep River was that siting activities had caused community divisions. Protracted siting had allowed time for opposition to build. Some relationships became strained and this was particularly true of CLG members who were often viewed as promoting the process. The siting issue was blamed for deteriorating friendships and dividing families.

Deep River residents pointed out that the STF has no real authority in the larger scheme of things and people were uncertain as to who the proponent of the project is. The STF had insisted that they were not the proponent. The lack of a visible proponent was a major flaw of the process. Deep River was correct in pointing out that the STF had no real authority. Since responsibility and authority should go hand in hand, one questions whether this process is balanced in its present form. It obviously could benefit from have a more clearly defined plan and a project champion who could act as a proponent or on behalf of one.

Impressions of Two Source Communities

Community reactions to and opinions of many facets of the voluntary process were the same regardless of whether one was a source or potential host community. This congruency leads to two conclusions. The first is that source communities have very similar experiences to the volunteer host communities. This is indicative of one of the key problems which was that source communities were too often elevated to the same level as the volunteers. Since they are only marginally necessary to a successful referendum, this seems overly generous and not entirely fair to the potential host communities. After all, there are only a limited number of resources. Secondly, the common findings provide validation for the description of what occurred during the process.

Both source communities (Clarington and Hope Township) cited the control feature of the process as a key reason for being involved. Much like the three volunteer communities who have lived with LLRW, they wished to ensure proper disposal of their wastes. They also wanted to retain control of how their wastes would be excavated and transported. This provided support for a positive endorsement of the control attribute within the context of the voluntary siting process. Not only did community control provide an incentive for involvement but, it also helped alleviate friction between the groups involved.

Unfortunately, the control attribute comes with a cost. For example, Hope Township pushed the limits of freedom when they requested funds to hire advisors of their own choosing and commission whatever studies that they felt may be required. This can be very damaging. Providing money to groups for public participation can be dangerous if the community is opposed.

as this money may be used to hire lawyers and experts to try and defeat the process.

The community wanted the siting task force and the secretariat to provide assurances that there would be a commitment on the part of the federal government that the solution to the problem would be carried out in accordance with the community's wishes. Obviously, this would be difficult considering that the STF's main task is not to make the decisions but, rather, to advise cabinet. Furthermore, the concerns of the source communities should be secondary to the host community's concerns.

Both source communities had public involvement needs assessment studies conducted. Their purpose of the studies was to gather information concerning what the communities felt was the best way to carry out a public participation program and identify additional information which may be required to respond to identified concerns. Letting communities decide if they wish to take part and for how long, and giving them such broad decision making powers, needs to be carried out within certain boundaries to prevent costs from going overbudget and timetables from being exceeded.

Surely, it was obvious that these two communities wished to get rid of their wastes in as safe and nondisruptive manner as possible. Spending so much time and effort to solicit a rather self evident opinion is going overboard. Furthermore, giving so much power and control to a source community seems very extravagant, time consuming and wasteful. Afterall, they are hardly relevant to eventually winning a referendum. Moreover, in spite of these heroic efforts, apathy prevailed and public participation was low. This is not surprising since both Clarington and Hope Township are guaranteed a clean-up regardless of the outcome of the process (decommissioning

orders are in place) and thus, there was not the same incentive for involvement as there was in Port Hope (which does not have decommissioning orders), the only source community to volunteer.

One resident's perspective on the low participation rate was that people did not get involved as they regarded the CLG as the so called "experts" and they truly trusted in this community group's judgement. This underscores the importance of the CLG and the need to recruit competent trustworthy people to it.

Both Hope Township and Clarington were strongly NIMBY. They certainly were not opposed to the siting of a facility, rather they just did not want it in their own backyards. Based upon their previous bad experiences, this was predictable. Certainly they felt that they had done their share in the past when they accepted wastes produced in other areas and were subsequently left with a mess. Their ensuing opposition seemed to also stem from what Kasperson et al. (1992) described as a lack of confidence in scientists' ability to diagnose the relevant risks accurately. They had a lack of faith in government's ability to manage the wastes safely based upon scientists' previous recommendations.

Safety was cited as the overriding concern in both Clarington and Hope Township. Just like the volunteer communities, almost all concerns were a variation of the safety issue such as safety of people and the environment. In fact, the concern about transportation safety was so great that there were mixed opinions about leaving LLRW on-site with better containment, versus transporting the waste out of the community. Some residents wanted to know if moving the waste was more harmful than leaving it alone. One study found some sceptics who believed that the

entire process was a "make work" program for the government and that its purpose was to delay the clean-up of their dumpsites and pacify people. Obviously this project required a well communicated trustworthy rationalization.

Faith in the government to handle the LLRW properly was lacking. Clarington claimed that the government had lied to them in the past about the waste contents (told that it was harmless). As a result, people felt that they could not trust the government's estimates of transportation safety. In addition, the community did not trust the government to hire the appropriate experts. There was also scepticism about experts in general as they were the ones that put the waste in their communities in the first place. This is congruent with Kunreuther et al.'s (1993) findings where a lack of trust was exacerbated by the discovery of health hazards from facilities that were once declared relatively safe.

People in Clarington and Hope Township stated that those responsible for the waste should pay for the cleanup. They also maintained that the government should follow through and solve the problem as it was thought to have gone on long enough. This seems to be a fairly reoccurring theme in the majority of communities. Only occasionally did someone point out that because all of society had benefitted from the production of products that are associated with LLRW, that all of society should bear the burden. Instead, it was those communities that benefitted most directly and in particular who gained employment that were seen to be responsible for the management of the waste. This concept deserves further study as part of the development of an acceptable ethical framework.

It came as no surprise that there were concerns about the effects of the waste on future

generations. The concept of a responsibility to future generations is a firmly entrenched ethical concept for both source and host communities and one which would also benefit from further research. Most communities were concerned how the acceptance of such a project would affect their grandchildren. It appears however that most concerns were for the next few generations rather than for those much farther down the line. To this end there needs to be more clearly defined standards of conduct to ensure the needs of future generations are not compromised.

Another aspect of the equity issue came up when Clarington's documentary evidence was reviewed. Clarington was still grappling with the social equity dimension of why they were a source community in the first place (they had not been producers of the LLRW). People also questioned the equity of the transportation issue and the expected disruption of their community especially since, they cannot by law stop the movement of material. This definitely, affects the control issue. In short, you can give them a "say" but ultimately they have "no say". A question that emerges is: "is the part of the process which enables source communities to have a say a political ploy?" Host communities are in a far better position as they were guaranteed the right to withdraw without any negative consequences. However, as mentioned earlier, some communities are suspicious of this claim.

The two source communities also had the opinion that roles were too ambiguous. Add to this the fact that the STF was unable to provide clarification as to who is the proponent and the process could be compared to a ship rolling around in the waves without a captain to steer her home.

Clarington, much like the volunteer communities, believed that there was not enough communication between the different parties (ie. volunteer and source communities, council, the

STF and the CLG). In particular, the CLG felt that town council must take a more active role and not just be a recipient of final reports. Likewise, the CLG requested that council provide more support of the process and the efforts of the CLG in order to build trust. This belief indicates a need for a more formal approach to the siting negotiations. Having council involved at the very beginning and end is insufficient unless town council is championing the process from the sidelines. This is true despite the orientation of the community (host or source).

Concern about the suspension of the process while the communities awaited a cabinet decision for future funding was voiced. This delay caused a loss of momentum and raised questions of whether the federal government's dedication to this process would continue. The lack of continuity was damaging to the mechanics of the process and the psychological attributes of morale and trust. An expensive project such of this, that covers a span of time greater than one government term should be supported by longer term funding.

Some of the suggestions made to make the process more effective included simplifying technical information, increasing action and reducing chatter. Some members of the CLGs wished to have more direction and structure from the STF. For example, one CLG member from Clarington stated a preference for a consultant to recommend how to manage the waste as he just couldn't see the general public dictating how it should be done. Another CLG member agreed but went further by suggesting that a professional should read the technical material and put it into perspective in lay terms.

Hope Township's CLG also expressed concern that CLG members' heavy involvement in technical issues detracted from members focusing on their fundamental role, which was

consultation with the community. Information needs to be managed constructively and that includes delivering the appropriate amount of information.

The CLG agenda was thought to be too heavy; there was little free time between sessions to assimilate information. This could have been remedied in part if the previous suggestion of simplifying technical information was taken. One CLG felt that this issue was frustrated by the practice of reports being dealt with only a layer at a time which resulted in them having to be rushed to get through all the necessary checkpoints. This problem originated from the top. For example, the head of the secretariat had a nontechnical background and after she had read the technical reports, they then had to be signed off by two specialists. This made the process cumbersome and slow. Once again, it is the old problem of there not being enough scientists who are good communicators and managers to head projects. Instead organizations end up compromising by choosing an expert in either a technical or social science field, thus handicapping the process.

At the time that this research was gathered, Hope Township spoke of what they considered to be two potential fatal flaws in the process. That is, that there are only two potential volunteer communities (there is only one now). This of course makes the choice of a community very limiting and it gives the perspective host communities a great deal of leverage when negotiating a compensation package. The second flaw is that the investigation of the feasibility of moving the wastes from the Port Hope area through other communities to the potential volunteers was inadequate. They worried that even if there was a single volunteer community at the end of the process, that the reaction from the communities through which the waste would travel will be sufficiently adverse that it may affect the project. Although legally, corridor communities would

be unable to stop the movement of material, political clout has a power of its own.

Balancing the Community Perspective - Views from the STF and the STF Secretariat

The fact that the siting task force secretariat was based out of Ottawa attracted individuals who were "anti-Ottawa". This made the job of the STF and the Secretariat more difficult because it diverted attention away from the siting issue. The Secretary General of the Secretariat mentioned that it was common for people in the communities to bring forward complaints about issues unrelated to the siting process. During times when there is a great deal of animosity being directed towards government (which was very prevalent during the majority of time that this process was in progress), it may be advisable for a STF to distance themselves from the federal government even if only on a physical basis.

The director general of the STF Secretariat stated that she expected the CLG to report to council regularly, although there were no formal obligations between the two. Generally, there was minimal contact between the CLG and town council and thus, very little basis on which to build trust. In spite of the fact that council originally gave the go ahead for the project, the reality was that many councils were not very involved. Councils' complacency may have been because they felt that the project's responsibility was largely off their shoulders as the CLG worked on their behalf which then allowed them to carry on with other issues. Perhaps the reason was also political. A former STF member acknowledged the importance of local politics in this issue when he indicated that some town councils desired government to government contact, which is not the main communication channel for this process. This was particularly notable in Port Hope where

the previous mayor, Betty Collins preferred not to deal through a secondary parties (the CLG and the STF), and approached the Minister of Natural Resources directly about their LLRW while continually ignoring the pleas of their CLG. To combat the problem of town councils feeling "out of the loop", future sitings should be subject to more formalized arrangements incorporating more contact between the federal and local governments for example.

All communities, except Deep River admitted that compensation was a key factor for volunteering. However Deep River's nonchalant attitude earlier in the process did not prevent them from negotiating a substantial compensation package which leads one to believe that it was more important than they acknowledged.

One of the observations that the Secretariat General made about the process was that she felt that compensation should have been discussed earlier and been more upfront. Discussing compensation earlier was mentioned to be an advantage by a few communities. Dr. Armour explained that this would have a number of advantages. For example, it would enable communities to determine if it would be worth their while to volunteer and it would force the STF to put a dollar value on a compensation package thus making things fairer for those communities which do not possess excellent negotiation skills. If offers of serious compensation were forthcoming it may also induce more communities with compatible cultures of risk perception to volunteer.

Dr. Audrey Armour stated that some basic survey rules were not met on account of town council having full control over many issues. For instance, in Deep River, they put a box in the post office for people to vote which made it impossible to control the number of votes as there was

no control to ensure validity of the vote. In future, surveys and questionnaires should be supervised by a professional outside agency.

Dr. Armour explained that although, there was a legal agreement that only council could sign, it was expected that the agreement would go public for one last time before it would be signed off since the voluntary process was an open one. In reality though, the two communities who got to the compensation negotiation stage carried out their negotiations without the input of the CLG in Port Hope's case and the public in the case of Deep River (the CLG had already disbanded).

The referendum is not a decision making process yet, many felt that a failure to abide by the wishes of a community as directed by a referendum goes against the cooperative nature of the process. Dr. Armour believed that a minimum of fifty percent support in a referendum would be required for the STF to go ahead to the next stage. However, according to the rules of the process, council has the right to decide what proportion they need and then assume political consequences for its actions. This poses a problem since this project extends beyond the mandate of most governments' and one wonders if it is fair that a municipal government could override the results of an electorate which has voted down a project.

The Secretary General mentioned that she found the process constraining once the guidelines had been published. However, communities volunteered and invested time and effort into the process according to a particular set of guidelines. Some criteria changes caused resentment. For example, initially there was a possibility of multiple waste sites (ie. a community could volunteer to take a portion of the waste). This was later changed to be a single site. On the few occasions when guidelines were changed, people became upset and trust was jeopardized.

The Secretary General commented that the voluntary siting process was such a lenient program that it was too easily subject to abuse. This could have been reduced if the process had more parameters placed upon it.

Those interviewed from the STF and the STF Secretariat, agreed with all the communities that the break in the process between stages three and four resulted in a loss of some momentum and some setbacks. This brings the credibility of the government into question as one tries to discern how committed they can be if they suspend the project in midstream. As previously noted, there were many questions regarding the government's long term commitment. There needs to be a commitment to the process for discrete time periods. There should also be commitments to hit certain stages in the process. For example, there should be a requirement that once stage four is reached that a referendum would take place. Being able to drop out at any time introduces too much uncertainty and can make the whole project a waste of time and money.

The break in the process and the corresponding budget cut back also meant that the referendum would now occur before detailed engineering work. Expecting communities to make a decision in the absence of key information, requires that the communities have more faith in the "government", something that is in short supply.

Dr. Armour felt that disbanding the original task force which occurred in conjunction with the suspension of the siting process, further complicated matters because it meant that the STF couldn't go back to the CLG and talk about what happened. This meant that loose ends were left hanging. Furthermore, the abrupt ending did not set the stage for a smooth reentry into the process.

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PRECISIONSM RESOLUTION TARGETS

One siting task force member felt that after the interruption, the process should have been subject to a full critique to determine if the process was still a valid way to find a potential LLRW site. However, the process was resumed in essentially the identical format. It was also obvious that the Minister (of Natural Resources Canada) and supporter of the process, Jake Epp, was on his way out (retirement). This left the federal department supporting this process, leaderless. Naturally, this had an effect on the process, especially when one considers there was no proponent declared for this project.

It appeared that the partial evaluation of the siting progress was carried out in isolation from the CLGs. The STF was therefore missing a very important opportunity for meaningful communication. Together the STF, the STF Secretariat and the CLGs should have been regularly evaluating the process to determine if it was still realistic and if not, how it should change.

Initially the task force was structured to gather together the range of expertise that was thought to be necessary on task force. Following the break in the process, a new group of people joined the task force. Some time was lost as people were brought up to speed and tried to establish relationships with the communities. The second task force appointed was weighted to the technical side and consisted of one scientist, two engineers (one civil and one mining), an environmental lawyer, and a medical doctor (who had experience working with uranium miners, but not nuclear medicine).

In the early part of the process, Audrey Armour who was the designer of the voluntary cooperative siting process was heavily involved but after she resigned in 1993, she was not replaced with someone who had a similar skill set. Of the seventeen full and part time staff on

the secretariat, only one was working solely on the community side of the issue for the four communities in the process towards the end. In phase four, one did not see the expertise reflected in the new task force and the secretariat. This shortfall was recognized and additional people were subsequently brought in on contract to fill some of the void. Unfortunately, progress had already been adversely affected and the referendum deadline had to be pushed forward. It would certainly have been advantageous to have engaged more individuals with expertise in community relations, risk management and project management earlier on.

The break in the process and the reappointment of a task force meant that the communities had to adapt to a STF and Secretariat that did business in a somewhat different manner than the previous one. For example, it was said that the new task force was less inclined to be as involved with the community and the secretariat did not encourage them to do so. A former task force member felt that this was not in keeping with the principles of the process, as the process was to have been very community oriented. Instead, it appeared that the secretariat wanted to take the lead role.

One secretariat staff member felt that the process became more bureaucratic. For example, the first task force had a chairman but this person's only extra duty was to be the designated media spokesperson. For the most part, decisions were made by consensus. On the new task force, the chairperson assumed a traditional role. This person worked closely with the Secretary General in Ottawa. The resulting quasi-hierarchical organization, was more controlled by the secretariat than the first STF. With more decisions being made at the top it became more difficult for the STF to get a sense of what the community was thinking.

When the Secretary General of the Secretariat was asked if she saw this siting as a risk perception issue, she replied that by and large that it was not perceived that way in Deep River but, that Port Hope was a complex community with a strong segment who feared the LLRW even though they had lived with it for years. Interviews carried out by the researcher found that in all communities this had been a risk perception issue, although in those communities with experience with LLRW, segments of the population seem not to see this as a risk perception issue. Nonetheless, it was remiss to not engage a risk perception expert when one of the biggest problems with LLRW is how to persuade people that it is possible to incorporate concerns, so they feel comfortable with a solution.

Although the STF Secretariat saw the siting of this radioactive waste as a social and political problem rather, than as a technical problem, this was not reflected in the allocation of resources.

The Secretary General stated that public consultation was the most difficult part of the process. She added that this had been complicated by the lack of a proponent and a project champion. She questioned just as the communities had, who was really in the driver's seat.

The Secretary General also stated that the social side was given "a lot of funding". However, one questions what that was in comparison to. Maybe it was in comparison to previous technical siting processes. It surely was not that funds were being allocated more to the social side than to the technical side.

The process which was originally a fairly academic activity took on a life of its own. In real life however, no plan unfolds the way that you expect it to unfold. There was extensive, well organized supporting documentation but, it appeared to serve those in the administration more so

than those in the communities. Overall, this project was too process driven; the process should serve the project, not drive it.

A STF Secretariat staff member agreed with the communities that at times the CLGs had not received the level of support that they needed from the STF and the Secretariat. Initially, there was no community involvement plan in place and there appeared to be too much of a focus on keeping the secretariat running efficiently rather than focusing on developing communications within the community. A former STF member felt that genuine public involvement was not there. He felt that there was not enough respect for the input of local people. Too often, the STF appeared to be trying to neutralize objections, rather than determining what people were really thinking. Meanwhile some communities got into war within themselves. Too much opposition in a community became an end in itself.

The STF seemed to frequently interpret speaking with the CLG as community consultation, when in fact the CLG's purpose is to be a channel for information. It is no wonder that the Secretary General said that being a CLG member was a burden. The CLG appeared to have inherited the main responsibility for community consultation. One of the STF Secretariat's contributions was to assign a person (who did not have to have a background in community relations) to each community to do administrative work for the CLGs and send display boards and schedule speakers.

The volunteer process is based upon the idea that you cooperate and jointly plan with communities in order to gain their acceptance. Oddly enough there was no detailed plan for doing this. There were no established objectives, goals or understandings of what it would mean to work jointly

with communities. There was no framework to determine what needed to be accomplished, limitations on decision making and what to do with input. Overtime, the STF and the Secretariat began to acknowledge this and more resources were allocated to public involvement.

The Secretariat's Secretary General felt that the CLG work term carried on for too long with the result that some CLG members become entrenched in their positions. However, considering the level of involvement of the CLGs, it would be very difficult to not defend a set of solutions derived over the evolution of the process. The head of the Secretariat also believed that you could never have a CLG that would remain neutral as it is impossible to disassociate feelings. The extended time frame also heralded other problems. Some very dedicated CLG members eventually had to resign because they could no longer afford the time to fulfil their obligations. Some spouses of CLG members stated that they were anxious for "it to be all over".

Perhaps the problem was not solely that the CLG workterm went on for too long but, rather that the CLG was doing work that they should not have done. The communities had far too much decision making powers. They became too involved in the technical aspects of the process. Not only was this time consuming and expensive but, it was also demotivating to those participants who worked so hard to come up with solutions only to be told that decisions made by the CLG concerning technical matters did not match the required standards and thus, had to be rejected or reworked.

A member of the secretariat felt that at times it appeared that the CLGs were being let down because it was thought that the real issues were not being adequately addressed. Unanswered requests can affect the momentum of the process as the participants hold back while waiting for

information which they feel is vital to their continued commitment to the process. If communities are empowered to make decisions and request things, the STF should be willing to respond as soon as possible. Excuses about things not being in the work plan or not being budgeted for won't fly. Covello (1989) found that official explanations that the generation of data about health and environmental risks is expensive and time consuming - or that health assessments and management activities are constrained by resource, technical or other limitations are seldom perceived as satisfactory (Covello, 1989). This was certainly the case in this process.

The types of questions that the communities had, could not be dealt with by another bore hole or another engineering study. They were much more fundamental than that (ie. health and safety). The STF should have responded more quickly to the community's requests for health studies. The uncertainty found in science was interpreted as evasiveness as communities suspected government officials of rewriting the health study so that it would illicit less fears.

One former STF member even suggested that it would be helpful to have some studies such as those to do with technical issues, transportation and health done ahead of time so the process would not drag on as long. However, he acknowledged that this may be politically impossible.

It is very telling that the Secretary General described the process as smooth sailing after the CLG in Deep River resigned. Following the CLG's resignation, the STF and the Secretariat dealt directly with town council. This leads one to many questions. For example, maybe the types of people working with the communities on the project are not comfortable with this type of interaction since they appear to prefer working government to government. It also makes one question their dedication to the principal concept of the process - that it is community driven. In

any case the communication format of the process needs to be reviewed. The process as it stands is plagued with inefficiencies.

Limitations of the Research

Since the interviews carried out in this study were ex post facto, they only illustrated community compositions and opinions at one stage in time. External validity may have been restricted because data collection included only the communities remaining at the latter stages of the process.

The fact that the sample studied is only a small portion of those originally approached by the STF, meant that only very limited conclusions can be drawn about those who chose not to continue into the later stages of the process. The exclusion of the 829 municipalities who did not respond to the initial offer of public information made it impossible to know whether or not the biggest difference between the groups would be found between those who initially invited the Siting Task Force to give information sessions and those who did not. This reduced the generalizability of the results and made it difficult to identify and interpret noise in this study. However, every attempt was made to identify any factors that came up during the course of the study which appear to be making an impact. For example, unavoidable noise in the study did occur as a result of one community being disqualified from the Siting Process on the basis that they did not have a section of land large enough to house a facility. Another community disqualified itself after it took too long a period of time to get approval on a large enough suitable section of land. In addition, there may have been other communities who did not respond to the initial siting request

because they believed that they had unsuitable physical characteristics (ie. geology, hydrology, topography) and/or prohibitive transportation costs and other relevant technical and environmental issues. Interpreting the effect of these factors would have been extremely costly and time consuming. As a result, there may be critical pieces of the puzzle missing. For example, it is impossible to know if other communities were adequately informed about the process and maybe they might have been interested if the timing and presentation of the concept had been different. One of the primary criteria for showing cause and effect is the absence of other casual factors. Not only are after the fact studies incapable of demonstrating this criteria, but practicality prevents the researcher from examining all the potential variables.

It is recognized that certain aspects of human life which could affect the process, such as religion and aboriginal rights, were not examined due to time and cost constraints. However, neither interview or documentary evidence brought forward these issues.

Internal validity was strong for those straight-forward issues which were obtained through primarily numerical data. Internal validity for non-numerical data was difficult to measure as there is no way to determine accurately if community decisions to go forward or not with the site selection process had more to do with individual personalities and points of view than unified community voices. The researcher fully acknowledges that variables stemming from strong community personalities may have inadvertently been labelled as being representative of the entire community. For example, many of those interviewed were public personalities and community orientated types, who may have somewhat different views than the so called "average" citizen. This may have unintentionally suppressed more widely held views. To help counteract this, as many community liaison group members (who are charged with representing the public's interests)

as possible were interviewed. In addition, the documentary evidence which was extracted from a larger segment of the population was considered equally along with interview information. Ultimately, the only way to minimize this factor is to ensure that communities hold referendums and enter the site selection process based upon the results of them. Although all alternative interpretations of results (ie. the effect of personalities and opinions, the exclusion of religious and cultural factors from the study) cannot be ruled out, the rating of many key variables mentioned in the literature improved internal validity.

In the odd case, subject maturation made obtaining information more difficult and possibly less accurate. The extended time frame of the siting process and the thesis data collection process meant that some of the players changed (subject mortality) and also that those remaining may have changed over time and the reasons they may cite for agreeing to be part of the siting process and their impressions of the process, may not be those that they initially espoused. The extended time frame of the siting process may have also contributed to boredom and fatigue which could easily have coloured a person's view of a siting process. Overall, maturation could have marginally affected the replicability this study.

Subject attrition turned out to be a minor issue. Only on the rare occasion was it impossible to locate a major key CLG member or politician. Fortunately, there was good enough documentary evidence from unlocatable key people to give the researcher an idea of what their prevailing attitudes were.

Although predictive validity depends upon the uniqueness of the study, the researcher has concluded that it will be good because the results appear to be in agreement with recent sitings

that have been carried out in British Columbia and Alberta for other controversial waste management facilities. Therefore, the researcher is confident that the extent to which a siting process will be successful will depend upon a community having a collection of characteristics most closely associated with those communities advancing the farthest in this siting selection.

Further limiting this study, is that many municipalities and Statistics Canada did not keep the type of up-to-date, detailed records that were sometimes desired. Therefore, some community profiles are estimates based upon the best available and sometimes non-scientific information.

Unfortunately, like many other studies, this study focuses on only one siting process in one province and there may be characteristics specific to this process and locality that limit external validity and thus, generalizability. However, the benefit of this study is that it traces back to some of those communities that withdrew from the siting process thus opening the window wider on the siting process than those other studies who have examined only successful candidates.

RFCOMMENDATIONS AND CONCLUSIONS

Whatever method is used to site a LLRW management facility, it is imperative that the approach combine a rational selection of the most physically desirable site taking into account the potential socioeconomic effects of the siting alternatives. The voluntary siting approach when managed properly can strike the correct balance of these factors and yield positive results.

Admittedly, with only one potential host site remaining, this particular siting exercise could hardly be declared an overwhelming success. However, this does not indicate that it is time to abandon the voluntary siting process. To date, it is probably the best procedure for siting LLRW facilities because it embodies the two principals of community control and voluntariness which the public demands. With some fine tuning which can be supplied through heeding many of the community recommendations documented in this research and with better planning and more committed political support, this community focused approach could become the standard in siting LLRW management facilities.

This thesis identified a set of community characteristics which comprise a community culture which was found to be positively related to a willingness to volunteer to host a LLRW management facility. In addition, a number of issues were isolated as having an affect on siting activities. Heeding these should make the job of those executing siting exercises run more smoothly. A series of observations and associated recommendations which should prove helpful for those planning future siting activities are outlined in the following section.

Observations and Recommendations

Risk perception continues to be a key factor in the siting of LLRW management facilities. Several factors influencing people's perception of health and environmental risks which were identified by Slovic et al. in 1980, were validated in this siting process. Volition, control, familiarity, media attention, scientific uncertainty, accident history, origin, effects on children and future generations, trust in government and institutions and equity and fairness all played roles in determining how long the volunteer host communities remained in the siting process. These factors provided a basis for a "thumbnail" sketch of the type of community more likely to remain involved in this LLRW management facility siting.

Kasperson (1990) found that people perceive risks to be less when they have input into decisions. This sentiment was certainly echoed in this study. The power sharing and public participation attributes of the voluntary siting process were crucial steps in restoring public trust while trying to site LLRW. Giving the communities the privilege to withdraw from the siting process at any time reinforced the control aspect and was an important incentive to obtaining volunteers. Those who could be affected by development projects and motivated by a distrust of government and industry, insist on being meaningfully involved in decisions and they want control over things that will affect them. Controllability has been shown to be second only to volition in terms of influencing risk perception (Cohrssen and Covello, 1989). A Canadian poll carried out by the Angus Reid Group (1988) found that people considered community control in siting decisions and independent monitoring of the facility to be the most important. This certainly was reassuring to those in this study.

Research has revealed that economic incentives were ranked as less important than local control when evaluating people's willingness to live near a hazardous waste treatment facility (Lyons et al., 1987). All communities liked the control aspect of the voluntary siting model and mentioned its existence as one of the main reasons for becoming involved in the siting process. Once again, the effectiveness of giving a community the power to shut down a facility and have independent monitoring and representation have been shown to be effective means of gaining approval. This supports O'Hare et al.'s 1983 findings.

In this study, the power sharing aspect of the voluntary siting approach contributed a great deal to bridging the gap between scientists and the public so that communities felt more comfortable volunteering for these facilities. Furthermore, the voluntary siting approach appreciated the psychological and sociological dynamics of siting which can foster public acceptance. For certain, the voluntary siting approach which goes hand in hand with increasing community control and decreasing risk perception can only improve the odds of a successful facility siting.

Not only did the voluntary process decrease the perception of risk in this siting exercise, but, it also appeared to draw out communities with cultures that will accept these facilities. Gerrard's (1994) study of other sitings revealed that the nature of the local culture and the degree of local control seem to play a significant role. Without a local culture's acceptance of LLRW, it is counterproductive to force disposal facilities upon unwilling hosts. It never works and it could turn a voluntary risk into an involuntary risk which violates the control factor which is so crucial to successful siting. Deep River, more so than the other communities most closely met the profile of someone who would be a volunteer community as determined by this research.

In this study the tendency of technical experts to be poor communicators often translated into difficult to understand information which was sometimes regarded as suspect. Information should have been provided at several levels of technical detail in order to meet the varying needs and attention spans of different groups. This was especially important in atypical towns like Port Hope, Deep River and Elliot Lake where one segment of the population was very well informed about radioactive waste matters.

The CLGs were too involved in site design selection. It was inefficient and inappropriate for the government to allow a predominantly non-technical group of people to complete a very technical task. For the most part, technical work should have been done by the technical people.

Limits should have been placed upon the distance that the LLRW could be moved and the form of transportation that would be used. A restricted number of options should have been presented for feedback. For example, the community could have been told which rail route would be used and then asked if there were any times that would be unsuitable. The Alberta Special Waste Management Corporation successfully used a similar process to site a hazardous waste incinerator with the major difference being that they had a list of technical criteria that had to be matched and the type of facility was decided ahead of time so there was not a lot of time wasted negotiating a type of facility. At the end of the process, they had the luxury of picking from amongst five finalists. Maybe if something is more difficult to become involved in, it may be deemed more worthwhile.

It was unfortunate that National Resources Canada failed to consult the experts in the community of Deep River who were employed at AECL. When the new task force was assigned it would

have made sense to have included a technical expert from AECL to the task force so that their knowledge and experience in the Deep River area could be called upon. AECL should have been involved especially with the technical phase. This could have saved a lot of time and energy. The lack of coordination between the two government affiliates - AECL and National Resources Canada could have easily permanently derailed the project. This problem was indicative of a serious flaw in the process - that is that key players and in particular a proponent, were not fully identified. Without a champion for this process, the project was vulnerable.

Although compensation in isolation is not enough to induce a community to host a facility, it is certainly a powerful persuasion tool. A number of factors which have been shown to increase public acceptance of LLRW facilities in other instances were common to this siting exercise. Two of these factors relate to the compensation issue and they include the treatment of local waste (co-disposal) and the provision or protection of local jobs (Gerrard, 1994). Both these factors were key components of Deep River's compensation agreement.

Although town councils were only marginally involved until the final stage in this process, they surely did have all the power. For example, Deep River's CLG recommended opting out of the process at the end of phase three and council overruled it. This affects the legitimacy of the CLG. How seriously will the public take the CLG if in the end they are so easily ignored? There needs to be some mechanism to bring the CLG and council together so they present a more united front, especially since they are both suppose to be representing the public.

Although the STF recommended that the negotiating team include some non-elected community representatives it was not a requirement. Port Hope and Deep River as the only communities to

enter into compensation negotiations shut the public out. In future, it would be wise to make it mandatory to have some non-elected officials on the negotiating team as a way of insuring that the public's views will be heard. The best way to do this would be to have CLG representation on the negotiating team.

A commitment to justice, openness, health and environmental protection, voluntarism and joint decision making are all part of the voluntary siting process and comprise the cornerstones of a solid ethical framework. Good communication and the sharing of decision making and fair compensation must also be included. Ethical behaviour will foster the trust which is so essential to this type of siting. An ethical framework needs to be expanded to include the larger issues of waste source, amount and conservation.

Although having the project carried out by people on contract instead of permanent government workers makes things seem less biased, it also removes the responsibility from government if this project fails. The siting was carried out with too little commitment to a goal driven timetable. Setting specific target goal dates are a useful way of preventing a stalemate and fostering compromises and achievements.

Ultimately, no siting exercise will be successful without long term political support. Although this siting was politically motivated at the federal level, it is necessary to ask if it was politically viable. The difficulty is that politicians are notoriously short-sighted as they never know how long their stay in government will be. To be politically viable means that there must be enough political and public consensus at many levels for the LLRW management facility to be constructed. As demonstrated in this thesis, sustained citizen opposition and apathetic politicians

can derail a project.

Overall, this process was too wide open; there should have been a better balance between control and efficiency. For example source communities benefitted from having much the same level of resources as the volunteer host communities. One resident commented that too much money was being spent beating around the issue and there was a suggestion to stop having meetings and get to the heart of the problem.

Concluding Comments

The government did its homework when they instituted Audrey Armour's voluntary siting process. They toured the country trying to determine the best siting approach. However, they should have followed through by pretesting the proposed guidelines instead of just measuring acceptance of the concept. After guideline acceptance, more time should have been spent getting to know the volunteer communities. The insights gained by taking some extra time at the front end and developing a systematic appreciation of a community and its people is essential to the development of an effective public participation process which is the backbone of this siting approach.

Approval of the basic concept of voluntary siting was resounding. All the communities laid out concerns, many of which were shared and some which related to the particular culture and demographics of a community. The success of this process and ones that follow will depend largely upon how well the process can incorporate these into a very directed voluntary process that

is accompanied by an effective public participation program.

This thesis has provided some useful information for the future study of compensation and ethical issues. Both of these issues have a significant effect on the outcome of the voluntary process and both require further research.

Longevity in the siting process appeared to be linked to a particular profile. The community profile developed by looking at community characteristics common to the communities which advanced farthest in this siting process should make it easier to determine which kind of community whose culture makes them more likely to volunteer. The one drawback of using such a profile is that it may be seen as unethical. However, if the voluntary and control aspects of this siting model are maintained, it should pose a minor problem.

Unfortunately, longevity on the part of the organizing group orchestrating this process was also an issue. Identifying a proponent who could represent and support the process is a necessity.

Previous studies were primarily comprised of a series of distinct case studies which focused primarily on the approach taken by the site selection committee. The voluntarism approach presently employed by the more successful siting task forces was once again validated. However, having only one community to choose from is far from ideal. The unique value of this study is the development of a profile of a community culture which is more amenable to hosting LLRW management facilities.

In conclusion, this thesis will contribute to the existing research on two fronts: as a comprehensive validation of voluntarism approach, and as a cross case analysis yielding a profile of the type of community that is more likely to consider hosting of a low-level radioactive waste management facility. It is expected that a proponent who utilizes a voluntarism approach, and pays heed to the factors that make the siting process go more smoothly and targets communities which have many of the characteristics outlined in the profile, will both have more success and save time and money.

GLOSSARY

Atomic Energy Canada Limited (AECL) - The national research and development organization in Canada for the development of nuclear energy, including waste management systems.

Atomic Energy Control Board (AECB)

Community Concerns - Community concerns, real or perceived, are identified by the community and not the proponent.

Community - A community is defined as a collection of stakeholders involved in a siting process that may or may not follow jurisdictional boundaries. In general, there are two types of communities: the broader community which has a need for a facility and the host community.

Competent Community - A competent community is one in which the various parts of the community are able to work effectively together in identifying the needs of the community, can achieve a working consensus concerning goals and priorities, can agree on ways and means to carry out those goals, and can work together effectively to achieve them (Cottrell, 1977). In a modern day sense, it generally also means that a community has the necessary financial resources, planning capabilities and administrative support structures to articulate and control its destiny.

Economic Benefits - Conventional economic benefits (direct and indirect) for individuals, organizations and the host community that result from project expenditures, employment etc.

Equity Compensation - A provision to compensate the volunteer community for agreeing to accept wastes that were produced for the benefit of others, thereby leaving the volunteer community better off than it was previously.

Historic Waste - Waste for which the original producer can no longer reasonably be held responsible for.

Informed Collective Consent - Informed collective consent in facility siting generally means that all necessary information is available to the community and that the community is aware of, understands, has input into, and agrees with the process, issues, goals and objectives and the project plans (Greber et al., 1994). A community would need to be competent to give informed collective consent.

Low-Level Radioactive Waste Management Office (LRWO) - LLRW management office was formed at the direction of the former Minister of Energy, Mines and Resources. As part of Atomic Energy of Canada (AECL), LLRW's original mandate included the responsibility for cleanup and disposal of pre-1948 wastes in the town of Port Hope.

Mitigation - Measures taken in the design, construction and operation of the LLRW facility/site to prevent or reduce the negative environmental, health/safety or social effects.

Proponent - The individual or group ultimately responsible for a project.

Public Involvement - Public involvement includes not one single public but rather a range of publics. These publics consist of "any person, persons, or groups of people who have a distinctive interest or stake in an issue" (FEARO, 1988). The public involvement process provides the means by which public concerns, needs and values are identified prior to decisions, so that the public can contribute to the decision making process (FEARO, 1988). Not all publics will chose to participate but they will have the option to.

Effective public involvement would ensure that all those affected would be sufficiently represented in the decision-making process (Greber et al., 1994). Not only would different segments of the public be involved but the process would allow for divergent views. Consultation and negotiation should address and resolve all identified areas of concern (Greber et al., 1994).

Radiation - There are two types of radiation; high energy which comes from nuclear power plants and low energy (low-level) which includes infrared light emitted by all warm objects, visible light, ultraviolet light, radio waves, microwaves, radar, ovens, X-rays and gamma rays used in the treatment of cancer and medical diagnosis. For the purpose of this research, low level radioactive waste will be defined as all waste which is not classified as high-level waste or uranium mine and mill tailings. They are generally grouped into three categories: those produced by uranium refining; those produced by the operation of research and power generation reactors and those wastes generated by radioisotope production and used in medicine, research, and industry including wastes contaminated by such byproducts (ie. containers, surgical gloves, gowns etc.).

Radiation dose depends on the source, exposure time and the distance from the source. Radiation occurs as a wave or particle formations which give up all or some of their energy upon contact with matter.

Remediation - Measures taken to compensate individuals or organizations within the community for negative effects that cannot be satisfactorily avoided or reduced through mitigation, thereby ensuring that the community is not worse off for hosting a LLRW facility.

Stakeholders - The three categories of stakeholders include the proponent (project sponsor) who is primarily concerned with the project's viability especially the economic aspects, the affected communities who focus on risks and benefits and the regulatory agencies which are concerned with following regulations.

Source Community - Communities who presently house low-level radioactive waste. For the purposes of this siting project, source communities were required to take part in the cooperative siting process.

United Nations Conferences on Environment and Development (UNCED) - Responsible for the Earth Summit held in Rio de Janeiro and the subsequent publishing of Agenda 21.

Appendix A

Community Interview Questions

What convinced you to considering entering into the siting process for a low-level radioactive waste management facility? What are some things that motivated you to participate?

What was the level and the pattern of participation like in your community?

Was it a high profile issue in your town?

What kind of publicity did you get?

Did you find that this issue has taken up too much time? Was this time used productively?

Do you feel that you were given enough appropriate information in a timely fashion about the process and its ramifications to make informed choices?

Were you provided with adequate resources to conduct your activities including independent research?

Is there a NIMBY reaction in your town? What things are contributing to the NIMBY reaction in your community?

Do you have faith in the government to follow through on this project to completion and do it safely?

Is this a risk perception issue in your town?

Do you believe that you have control and the option to opt out at any time? Does the process feel voluntary?

Do you feel that you and other members of your community were treated with respect? Did you feel like equal partners? Did you feel undue pressure to accept a waste management facility?

How important is mitigation for any harm caused by such a facility? How important is compensation to you?

How do you perceive benefits?

Have you any concerns about the long term affects of such a facility on future generations?

How do you predict that a referendum vote would go in your town? Why?

Appendix B

Township of James

Motives for Involvement

Following the CLG's recommendation to continue in the siting process, they gave a statement supporting their decision. Among their reasons for continuing were to be good citizens: "we created it, we have to look after it" and for the ensuing opportunities: "waste management is the industry of the future". Council felt that modern technology would enable them to handle and store the wastes with a minimum risk. Council also anticipated that the increased knowledge to be gained from the in-depth studies of their local area as provided in phase four could result in a new industry and a broadening of the economic base (James, q).

The mayor defended the proposal by mentioning that it would create jobs that would allow youth to remain in the area rather than moving south. The opportunity to take advantage of a voluntary government sponsored program was also an incentive (James, a). The town's economic situation was in a fragile balance with a tax levy of only \$140,000 (moneys come as 80% from the province and 20% municipal taxes) (James, A).

Involvement Patterns

Some claimed that it was too early to get involved while others complained that they were getting sick of talking about it (James, b). Overall, most community members only became involved at major decision points or when a potential decision was going to affect them directly (James, b).

The radioactive waste issue became such an emotional issue that the mayor contemplated stepping down (James, A). Council found the public to be opinionated on the issue but, not very knowledgeable (James, b). Several residents complained that the issue was tearing the town apart and causing tension amongst friends and family. A couple of CLG members even received angry anonymous letters and phone calls (James, c). A very active and effective opposition group called CARD (Citizens Against Radioactive Dumps) was formed to fight the siting process (James, d).

Environmental Suitability

Many residents had concerns about the area's geographic placement near the head waters of both the Arctic and Great Lake's watersheds. An interview of forty-five residents revealed that most were concerned about the water table, and leakage damaging lakes and rivers (James, s).

Some residents noted that the high acidity of the soil (4.5 pH) could overtime damage a facility. There were also concerns about fractures in the cambrian shield common to the area that could result in earthquakes. Lastly, an Indian Land Caution which was tying up large tracks of land (seventy-five per cent) was also a limiting factor (James, e). In fact, this land was frozen from development until 1993 (James, A).

Risk Perception

This was definitely a risk perception issue - fears were never put to rest. It was mainly a fear of radiation and of the unknown (James, C). Many residents had a NIMBY attitude that was in part fueled by a sentiment that the south was taking advantage of the north (James, C).

One CLG member commented that there were a few professional protesters who frightened a lot of people but, that it was only a few individuals. He recommended disallowing the participation of outside groups and focusing on the host community before adding in the input of other communities (James, C).

Health and Safety

CLG members were very concerned about health and safety. The main question from the community was: "how dangerous is it?" and "what if it gets into the water?" People wanted more definitive answers (James, s). There was a request for information about health effects on this generation and the ones that follow (James, C).

Transportation

A common fear was that there would be an increase in accident possibilities related to the extensive distance from Port Hope to the Township of James (James, e).

Tourism

For the twenty-two tourist operators working over 470,000 hectares, there were some fears that few would want to visit if there was a nearby dumpsite (James, A). CARD stated that Elk Lake's (largest town in township of James) reputation had already been damaged by their involvement in the process (James, d). A local resident reported that at a nearby meeting, Elk Lake was being called "Nuke City" and he pointed out that bad vibes had a way of sticking like velcro (James, f).

Property Values

There were concerns about property values dropping. Some James township residents threatened to move if the project went ahead (James, f)

Trust in Government

A lack of trust in government was a central issue for some residents. One resident stated that you couldn't trust the government's promises for compensation as the government had failed to deliver in other situations relating to low-level radioactive waste. They cited the situation in Scarborough where residents have spent ten years and \$300,000 trying to get the government to live up to its promises to compensate them for loss of property values of homes near the low level radioactive waste there. Many believed that the government might force them to site the facility if they were involved in the later stages of the process (James, B). There were also fears that acceptance of the project could lead to Elk Lake becoming a target for other waste projects (James, f).

Some felt that the government would not follow through on this project with adequate funding (James, C). They believed that the government would not set aside adequate funds to ensure the best possible facility, safest possible method of transportation and monitoring "ad infinitum" (James, s). It was felt that the government "is here today and gone tomorrow". There were also fears that the government may insist that James Township handle ongoing wastes. They also questioned the absence of the Ministry of the Environment, the Ministry of Natural Resources, the Ministry of Health and Welfare and their input into the process (James, g).

Interviews with forty-five residents revealed that most distrust and fear government and government process. An example given for this feeling was the present situation where the

provincial government has given the city of Toronto the power to expropriate any lands it needs to satisfy their requirements for waste disposal. People fear the possibility of either the federal or provincial government perceiving this area as a disposal site for other undesirable wastes (James, s).

Potentially Affected Communities

A number of residents from nearby communities expressed concern that they did not have a direct voice in whether the plan should proceed, despite that the material may be transported through their communities en route to Elk Lake (James, k).

Impact Management

As a result of interviews carried out with 45 people, the community liaison group found that most people were interested in the economic benefits that might result from hosting a facility (James, s). Compensation was seen as very important and the CLG did not see benefits as bribes (James, C).

CARD believed that compensation (they referred to it as a bribe) such as construction jobs and increased food and lodging expenditures were offered to impoverished communities to tempt them to accept the wastes with the result that five years down the road, the jobs will disappear and the town will be left indefinitely with the wastes and risks. An active CARD member stated that the government seeks out communities with economic problems and preys on them (James, h). A nearby resident from Kirkland Lake felt that "the risks were just too great for what benefits you would get" (James, doc, j).

Ethics

There was a feeling, especially by the members of CARD, that sending the wastes from one place to small, economically needy communities is a band aid solution which encourages governments not to face up to the real causes of what produces all this waste (James, i). The editor of the local newspaper who is was also an active member of CARD, felt that it was not worth putting future generations at risk for the sake of a few dollars (James, l). One resident mentioned disliking the idea of leaving the wastes as a legacy of radioactive waste for their children and grandchildren (James, i).

CARD believed that the government should be forced to deal with the wastes where they are presently located because Port Hope benefitted from jobs associated with them and thus, should be responsible for the wastes (James, g). Moreover, they felt that the wastes would be just as safe there as somewhere else.

Another common sentiment was a belief that those who live in the north should be encouraging the populated south to realize that their waste disposal problems should not be solved by sending waste someplace else (James, i). The radioactive waste issue was viewed as someone else's mess. Once again, it was compared to the plan to ship Toronto's garbage to a mine shaft in Kirkland lake. People also saw it as a North-South issue with hazards and potential risk. One citizen wrote that she felt invaded by the South (James, m).

Petitions/Referendum

Members of CARD presented nearly 3,000 signatures they had collected by going door to door to show council the widespread disapproval of the proposed LLRW facility. The Petition stated

that the undersigned did not want a Low-Level Nuclear Waste Storage site in or around James Township, regardless of the promises for safety and economic benefit. It also demanded that Council terminate all involvement with the Siting Task Force immediately. CARD maintained that because the majority of the community had signed their petition, that council should save the \$1,000 cost of a referendum. They felt that there was enough information to make a decision to opt out of the process (James, n).

At the same time a council meeting drew forty people who came to demonstrate opposition to the proposal (James, o). When the petition was discussed at the next CLG meeting, the CLG concluded that the petition was like most petitions; that is, one-sided (James, a). In fact, the CLG pointed out a glaring error. The petition talked about siting a facility and not advancement in the process which was the question at hand. In fact, some citizens upon finding that they were only involved to determine if they wished to advance in the process said that they wished that they had not signed the petition. Some felt that after listening to some of the speakers brought in by the CLG and the STF that they had learned enough to change their minds about the process (James, a). The CLG suspected that the use of the word nuclear probably frightened many people and the use of the phrase storage facility rather than waste management facility may have turned some people away from the proposal (James, a).

The mayor felt that there were many supporters but they were not out canvassing and that many of those in favour felt threatened by those people from the surrounding area (so called environmentalists) who seemed so knowledgeable and appeared to be looking down their noses at them (James, p).

The CLG voted in May, 1990, six in favour and four against going onto phase four (James, p). As a result, the CLG recommended that council proceed to the fourth phase.

A referendum was carried out on October 1, 1990 with the question: "Are you in favour of council continuing into phase four of the study into low-level radioactive waste disposal site for the Township of James or do you feel that we should opt out of the process now?". One hundred and twenty-four out of town property owners were sent questionnaires and seventy were sent back (fifty-five per cent response rate). The out of town property owners were sent letters from council and allowed to vote but they were also sent letters by CARD. Eligible intown voters totalled 381 and when combined with out of town voters there were 505 people who were entitled to partake (by mail) in the referendum. The voter turnout was seventy-three per cent with eighty advising continuation onto phase four and 300 (seventy-nine per cent) directing council to opt out of the process immediately (James, q). Like the early petition by CARD, the mayor felt that the referendum was also subject to more opposition than expected because many residents may have misunderstood the intent of the referendum thinking that it meant a willingness to host a facility rather than just advancement in the process (James, a).

As a result of the referendum vote of 300 votes to eighty in favour of opting out of the siting process, the council for the Township of James informed the siting task force that they would abide by the opinion of the electorate at the referendum and opt out of the siting process effective on October 10, 1990 (James, r).

One CLG member indicated that he felt that the referendum on the matter at this stage was premature and a waste of money, adding that it may have been beneficial to see what the results

were from the fourth phase of the siting process which would have included further site investigations, followed by a referendum at the time recommended by the Siting Task Force (James, q).

Siting Process Concerns

Some CLG members stated that the process took up a lot of time but that it was an excellent education (James, C). At the end of the process, the Community Liaison Group made the following observations and recommendations to the Siting Task Force about the siting process: the CLG felt that it was unprofessional in the early stages to hand out maps and expect the residents to make decisions regarding site elimination. There was also a concern that the process was so flexible that an early referendum stopped the process before full information was available.

Recommendations

The early stage of the process was rushed due to the Town's late involvement. Unfortunately, the CLG also had a slow start on account of poor weather which resulted in the first couple of meetings being cancelled. This gave opponents time to gather a small nucleus of members (James, s). As a result the CLG concluded that organized opposition from people outside the community can have a deadly affect. Although some undecided community members came to the public meetings, many found the issue too emotional and the noisy interference by polarized groups not conducive to learning much from the experts. Others avoided the public meetings altogether saying that they were too frustrating. Some praised the process and the CLG while others criticized everything. CARD'S members interpreted speakers and facts differently, and people became confused about the issue.

CLG found that one on one discussions and fact sheets were more successful in reaching people and answering questions and addressing concerns.

The CLG made several recommendations. Firstly, they suggested that the STF give more guidance early on by spending more time with the CLG to familiarize them with their mandate and how to conduct public meetings. This would enable the Siting Task Force to learn as much as possible about the township's strengths and weaknesses in the very beginning. The mayor recommended that a few preliminary meetings with council about what issues are affecting the town would also be helpful. They recommended that the siting task force should spend time getting to know issues and spending time in town and find out why the town is considering the project. One CLG member felt that the STF should be more up front and try to answer more questions (James, B).

It was felt that if speakers were sent earlier that people would be less susceptible to fear mongers. The CLG also recommended that the Siting Task Force should encourage the CLG to work anti-nuclear types into the program earlier since they ended up having such a big influence on the process. Lastly, the CLG suggested that the STF should have encouraged towns to promote a LLRW Management Facility as a tourism draw (James, s).

Appendix C

Hornepayne

Motives for Involvement

Hornepayne became interested in hosting a LLRW management facility as a way to help rebuild its economy and stabilize its population and employment base. The two major employers, Haavalsrud Timber company and CN Rail employed 430 workers at the time of this siting exercise compared to 850 just a few years earlier.

The town commissioned The Coopers and Lybrand Consulting Group to do a report on how to deal with the economic and population problem in Hornepayne. The report recommended that the LLRW facility should be aggressively pursued as a high priority and a clear diversification strategy for the town. The consultants also found that no business that was surveyed identified any opportunities for hiring new employees (Hornepayne, a).

A letter sent March 31, 1990 by a concerned citizen supported the process saying that she felt that it was an opportunity for Hornepayne to help solve a world-wide problem and as a way to make up for CN's cutbacks which were expected to continue. She also stated that even if the search was unsuccessful, Hornepayne would be visited by many people who would bring business to local establishments and possibly bring fresh ideas and opportunities (Hornepayne, b). One CLG member stated that people in North should be involved in this, as the North with all its open space is a practical place for such a facility (Hornepayne, B).

Although the mayor was not in favour of the process, the Reeve along with the majority of council members were very supportive of hosting a facility in Hornepayne, primarily because of economics. The Reeve stated that historically any form of new development was met locally with opposition (ie. the new hospital, the hallmark centre, the airport). Therefore, making a decision based only on early community sentiment was disregarded.

Town council felt that they were obligated to take a free noncommittal look especially with the possibility of at least gaining more valuable information and research for Hornepayne. It was thought that phase four would provide additional insight into LLRW without eliminating the option of opting out at any future date (Hornepayne, k). The town Reeve felt that the emotions of a hand full of people opposed to a LLRW facility should not stand in the way of Hornepayne's survival. He promised to do his utmost to convince and ensure a positive attitude towards this facility. CN Rail, which would benefit greatly if the project went ahead, was also positive and offered up tracks of land that could be considered for the facility. CN Rail sent a letter to the CLG expressing their support and offering their expertise in the field of transportation (Hornepayne, c).

The CLG chair felt that the process had a lot of merit. He stated that it was the first time that any level of government had tried to obtain the town's input and it was comforting to see the government giving people a say (Hornepayne, A).

Involvement Patterns

The CLG consultation program was slow off the mark. Consultation with the community did not work until late January. For the longest time the CLG felt that the community did not care to

participate (Hornepayne, d). Many were not interested until they got down to the crunch (Hornepayne, B). The CLG chair noted that generally the only residents the CLG heard from were those who were opposed (Hornepayne, B). Interest ran hot and cold in response to the CLG's mandate of educating the public. Much of the public had a passive attitude about attending meetings partly because they appeared to have already made up their minds. In addition, there were some contentious meetings (Hornepayne, A).

Attendance at meetings generally varied from five to eighty-five with fifteen attendees being the norm. Occasionally 200 - 250 people would show up. At these meetings, there was opposition to proceeding in the process. The chair wrote in a letter dated September 27, 1991 saying that a "dark cloud has hovered over the town of Hornepayne". The final meeting of March 26, 1990 registered the most opposition. The message was clear, they did not want to proceed to Phase four. A member of the CLG did a personal sampling - of 136 addressed, eighty-six did not wish to proceed to the next stage (Hornepayne, d).

Opposition was very well organized and consisted of primarily younger people. A vocal group of young people went around personally and knocked on doors and presented a very convincing story (Hornepayne, B).

One resident reported that there was a good turnout at the first few meetings. People asked questions of the experts but after they received answers that they could not understand or they got non-answers; they became frustrated and stopped going. She explained that people thought that they were going to get a chance to vote, so why bother participating, rather wait until the opportunity to vote comes (Hornepayne, e).

There was a split in the CLG because some CLG members were opposed to the process. There were concerns as to what would happen if the process had continued because meetings would get very "hot" at times. Emotions ran high and the community was split over the project. In fact, the CLG chair did not really want to admit that he was in favour of the process (Hornepayne, A).

After one very hostile CLG meeting, the Siting Task Force Chairman commented that it was unfortunate that more people within the community had not come out earlier to make their opinions known (Hornepayne, f).

Environmental Suitability

Although, the former prime minister, Brian Mulroney claimed that waste such as Port Hope has, should be kept well away from any major water resources, many of the northern locations being considered as waste sites were near the height of land dividing the Atlantic and the Arctic watersheds and the head waters of the Albany River which flows almost 800 kilometres into James Bay. Many thought, it did not make any fiscal or environmental sense to ship the stuff (Hornepayne, p).

Risk Perception

This was definitely a risk perception issue for Hornepayne (Hornepayne, A). There was always a proportion of people who were opposed because they were afraid of the radioactivity. In fact, some were concerned that it was actually high level waste (Hornepayne, B). In the opinion of the CLG, the citizens of Hornepayne were not ready to accept the risks, perceived or otherwise, associated with a low-level radioactive waste facility, given the fact that no specific tangible

benefits were presented to the community. They also wanted assurances that a host community would be guaranteed regular site maintenance and repair in perpetuity (Hornepayne, n).

Health and Safety

The CLG unanimously agreed that health and safety impacts would be the prime concern and there was a community belief that health and safety would be compromised by hosting a facility (Hornepayne, h). In particular, there was a great deal concern about the arsenic level of the waste.

In a letter written to a local newspaper on January 31, 1990 the authors talk about the social costs of having construction crews coming from out of town and boisterous men possibly causing an unpleasant atmosphere (Hornepayne, o).

Transportation

Hornepayne acts as a transportation centre and in fact this was one of the reasons that the town was initially established. It also has CN main line east and west.

It was felt that because the waste was already in Port Hope that it should be left there instead of transporting it 750 miles and putting other communities at risk (Hornepayne, A). One CLG member concluded that people's main concern was about the waste entering town because of the additional risk of increased traffic.

Tourism

One resident questioned the impact on tourism in the area but overall it was not a major concern.

Property Values

There was a question concerning compensation value for homes if some residents feel that they must move in response to this project.

Trust in Government

The majority of comments heard towards the process were negative. It was the opinion of the CLG that there was a lack of trust in government and the Siting Process (Hornepayne, n).

Many questions asked at the CLG meetings where the STF was present were hostile and they had a definite anti-Ottawa flavour. It became obvious to the CLG from the types of questions asked that there was a fundamental misunderstanding about what the siting task force is all about and how the voluntary process works. The CLG responded by scheduling a time to reexplain the process (Hornepayne, g).

A member of the audience at a public meeting expressed concern that, if they proceeded to Phase four, the government would then have specific knowledge of the geology of the area and should there be no other suitable community to store the waste, and should Hornepayne have opted out by then, the government could then come back and independently site the facility on Crown Land outside of the Township without their consent. The audience reacted to this declaration by becoming quite vocal and angry. They told the STF representative to "go home - you are not wanted here" (Hornepayne, h).

The general mistrust was caused in part because the community was not told what would be in it for them. There were concerns that Hornepayne could also get stuck with managing the high level radioactive waste or else both high and low-level waste if the process failed (Hornepayne, A). Others suspected that the government might try to send extra waste thinking that the town would not really know the difference (Hornepayne, B).

Potentially Affected Communities

Hornepayne was not affected by nearby communities during the process.

Impact Management

The CLG believed that compensation should be addressed as soon as possible. The people of Hornepayne wanted to know what was in it for them (Hornepayne i). The CLG found that economic and other special impacts were not clearly stated and that convincing information was lacking (Hornepayne, h). It was felt that the STF should say something to give the community a starting point in terms of compensation.

One citizen commented that after attending a large number of meetings with an open mind, that he eventually concluded that there were only a few jobs from this, and no real benefits to the community (Hornepayne, f). The CLG chair pointed out that the project would only provide seasonal employment because of the Hornepayne's weather (Hornepayne, A).

Ethics

The major ethical dilemma was the effect that the project would have on future generations. The community was concerned that there were no sincere answers on this issue (Hornepayne, A, B). Fear was primarily centred on the effects of the radioactive part of the waste (Hornepayne, A).

Petitions/Referendum

A petition with 350 names was circulated during the early Spring of 1990. It read simply: "we the undersigned do not want a radiation dump in Hornepayne" (Hornepayne, d). The petition was not given much consideration however, as some names were duplicated and some were of non-residents.

In a letter written by the Clerk Treasurer of the township of Hornepayne, June 1990, council thanked Mrs. Bonita Currier and her friends for obtaining 481 names on a petition requesting council to rescind the motion to proceed with Phase four of the siting process for a LLRW management facility. While council commended their efforts, they disagreed with their views, siting that more information must be made available to the residents before they make a decision. The Clerk Treasurer wrote that phase four would yield valuable information and research as well as put extra funding into the community and yet there would still be the option of opting out. The letter states that it would be a "dereliction of our duty to the residents of Hornepayne to not continue" (Hornepayne, l).

After twenty-two weeks of participation, a closed ballot of CLG members to the question of Hornepayne opting out of the siting process for the Low-Level Radioactive Waste Facility was five in favour and two opposed. A news release said that Hornepayne's CLG recommended that the council rule to opt out as they felt that a majority of community residents were opposed to proceeding to phase four of the siting process (Hornepayne, h). The CLG chairman notified Council in writing that after five months of consultation with the people of Hornepayne that "we,

members of the Hornepayne CLG, advise that the Township of Hornepayne opt out of the Siting Process for a low-level radioactive waste" (Hornepayne, j). In addition, the CLG report advised council not to proceed to phase four. However, all except one member stated publicly they would support council in whatever their decision was (Hornepayne, j). Council decided to continue as they felt that the CLG's decision had been based more on coercion than on personal reasoning (Hornepayne, q).

The siting task force warned council against holding an early referendum until all the facts about hosting a facility were on the table. Vera Lafferty, secretary general of the STF Secretariat was concerned not only of losing Hornepayne but also, that Hornepayne's referendum might incite similar lobbies in Geraldton and Deep River. She then feared losing all three volunteer communities prematurely on the basis of emotions and politics. Although the reeve supported this idea, he felt that council would have to cave in to the mounting public pressure for an immediate referendum. He predicated that the silent majority that would normally be supportive to the potential of some economic development would react apathetically in response to the organized emotional lobby group (Hornepayne, q).

Council asked voters the following question: Do you want to proceed with Phase Four to find a site for storage of low level radioactive waste. With a forty-five percent voter turnout there were 170 yes and 345 no votes (Hornepayne, A).

Siting Process Concerns

At the end of phase 3, seven CLG members continued onto the next stage. Four of the five of the original members of the CLG who resigned did so because of a lack of time. The process was just so time demanding (Hornepayne, m). In the CLG's final report, it was recommended that experienced CLG members be consulted on potential new candidates (Hornepayne, n).

The structure, format and context of the public meetings were considered deficient in several aspects. The role of the CLG was not clearly separated from the STF secretariat and the guest speakers. As a result, the CLG was put into a defensive position at public meetings. Many questions, especially those concerning the process were repeated at each meeting. Throughout the exercise, misunderstandings arose regarding the role the members of the CLG played in the siting process (Hornepayne, n).

David Lindsey stated on a radio interview that he wished to drop out of the process because the Siting Task Force tells them one thing and other people who are familiar with this stuff (radioactive waste) tells them something else (ie. saying there was a little bit of arsenic when in fact there is a great deal). He also complained that no standards exist to calibrate what is high and low level. He also felt that the process was political because Brian Mulroney made an arbitrary decision regarding the removal of this waste from the Port Hope area. Mulroney's decision was not based upon scientific or environmental reason but on pure political reasons; it was an election year.

Siting Task Force policies regarding funding, speakers and locations of waste sites in relation to the community core, were not clearly outlined and many contradictions were apparent (Hornepayne, n). The CLG had some concerns over the process, some felt it was deceptive, that information was withheld which was damaging to the process (Hornepayne, n).

Communication between key figures of the Siting Task Force Process Facilitators, office staff, speakers and the community was considered poor. Communications between the CLG and the Siting Task Force members frequently broke down, and different interpretations of events were given by various Siting Task Force Members (Hornepayne, n).

Recommendations

Presentations were found to be one of the better ways to inform. It was felt that they could have been improved by having a standardized presentation worked out. The media proved to be helpful tool. The presence of a CLG office was an important link in the consultation process as it was a location where information could be obtained (Hornepayne, n).

Appendix D

Elliot Lake

Motives for Involvement

The CLG chairman felt that the town could host a facility because they have the skill, experience and a safety conscious workforce. At the time, 2,000 people worked under ground (Elliot, a). People in the mines felt that the idea of siting a low level disposal site would be healthy for the uranium industry (Elliot, h).

Some opinions encountered by the CLG were that as a town based on mining uranium, this community should continue to opt into the voluntary siting process. Some felt that Elliot Lake should explore all opportunities which could expand their economic base as the town was experiencing an economic downturn which was expected to worsen (Elliot, h). A major local employer, Stanleigh Uranium mine which employs 600 is due to close in July 1996. In addition, there is very little local industry so a new business proposal would be helpful.

One of the benefits which the town council had hoped to obtain if they became a host site would be the development and expansion of research into LLRW. It is also worthy of note that one of the technology options suggested by Elliot Lake was the milling of the waste through the Panel Mill which already provides to the town of Elliot Lake alone, realty taxes in the amount of \$400,000 (Elliot, a).

A CLG member representing the senior population surveyed 200 people, most of whom were seniors who had worked in the uranium mines for many years in Elliot Lake. He estimated that ten per cent were dead set against a LLRW facility, ten per cent were undecided, forty per cent wanted more information and forty per cent were in favour because of the local expertise on radiation and toxic matters (Elliot, h). One CLG member cited concern for future generations as the top motivating factor for becoming involved in the process (Elliot, E). This is in direct contrast to other communities which list concern for future generations as a reason for opting out of the process.

In Elliot Lake's final report, the recommendation of the CLG to move to phase four was partially based upon the belief that the expertise gained from dealing with low level waste would assist the community in learning how to deal with the possible effects of the existing tailings which constitute the largest body of low level wastes in Canada.

Involvement Patterns

Meetings were poorly attended. One CLG member noted that people would complain but not act, in the same way that they do with other issues. Few became involved until the end although there was lots of publicity and a great deal of information. Those who did become involved were thought to be too emotional and many failed to grasp the overall picture (Elliot, F).

The CLG chairman commented that it was disappointing that the CLG did not get feedback from the public until it presented its report to council. She stated that "If we had heard from the protesters beforehand then it would have been in our report". A random telephone poll by the CLG had indicated early on that there were sixty-seven per cent in favour of continuing to phase

four (Elliot, c).

A CLG member expressed his concern about the lack of council member's attendance at CLG meetings especially in view of the significant inconvenience to CLG members to change meeting nights as requested by the town council (Elliot, d, D). Council was an ongoing battle. In the beginning council approved. In fact, they originally approached the federal government. A municipal election part way through the process changed some of the players and the focus of council. Three voted against continuing - two of which had been against the project from the very beginning as they had a lack of confidence that the chemicals could be contained and were concerned about long term effects (Elliot, D).

Consultation was limited due to time restraints. Phase three of the Siting process was aimed at community consultation and was to take 18 months to complete. It was only during the final six months that the community liaison group was formed and charged with the responsibility of fulfilling its mandate of facilitating the process of joint decision making vis a vis community information and consultation.

Public participation was low at first but towards the end there would be upwards to fifty people in council chambers for public meetings. Meetings were well publicized. The turn out at one open house was less than one hundred (out of a population of 18,000 people) (Elliot, D). Time restraints and the overall lack of open participation from the community as a whole appeared to reflect a lack of interest surrounding the issue. It was decided that too much information and the technicality of much it has caused some people to just not bother being informed (Elliot, g).

A number of delegations came forward after the CLG recommended that council proceed in the process. Opposition had been present at every council meeting since the May 28, 1990 announcement. The founder of the retirement living program came to council and informed them that continuing the process could only be harmful to the program that had attracted more than 100 seniors to the community. One CLG member didn't think that a low-level radioactive waste management facility would be incompatible if it were kept low key and the waste was deposited with the tailings in the middle of nowhere (Elliot, D). However, council decided to stick with the diversification strategy that focused on the retirement living program.

Although many residents worried about Elliot Lake's future, there was also a sense that the community could again rally. It had survived other bad times over the last 30 years, residents say and with or without nuclear waste it would again (Elliot, g).

Environmental Suitability

Many sites exist that can hold the wastes in the Elliot Lake region (Elliot, a). Also, there is infrastructure already available to deal with LLRW. The site size that would be needed for the waste is a little less than two per cent of the capacity of Elliot Lake's mine tailing basin. With eighty-five percent of existing tailings stored outside the community, one percent more that is properly managed would be acceptable provided that there was a net benefit.

Risk Perception

A report submitted to Town Council and the Siting Task Force concerning the hosting of a LLRW facility, spoke of community fears of: on going stress and health problems, possible increased social problems due to a perceived negative connotation of material, people relocating because of

a facility, a stigma attached to becoming a radioactive dump site and last, but not least, a revival of the NIMBY syndrome (Elliot, g, C, E, G). Some were afraid that Elliot Lake could become Ontario's ongoing waste site (Elliot, h).

Many were more concerned about the toxins in the waste than the radioactivity. Specifically, the fear was more to do with the chemicals and toxins that are not presently found in Elliot Lake (fear of the unknown) (Elliot Lake, h).

One CLG member indicated that she couldn't see any real dangers with the project. She explained that radioactivity was common in the area as the town was built on natural uranium. For example, she pointed out that a local nursing home called Huron Lodge has a uranium deposit under the front steps.

The most common reason for opting out, was found to be a feeling of not trusting the government regarding the safety of transporting the waste and the exact contents of the waste. Many felt that accepting unknown toxins was far worse than radiation. The second most common reason was found to be the possible bad reputation the town would get if it accepted the waste. It was felt that it would make it difficult to attract new citizens to town and affect tourism negatively.

Health and Safety

At an open house in Elliot Lake, the public expressed fears about increased health risks (Elliot, b). The CLG felt that there would be numerous negative social impacts to those handling and managing the waste such as possible injuries or deaths while transporting waste to Elliot Lake, and possibly increased health problems due to the perceived negative effects of siting LLRW (Elliot, g).

There was no denying that residents were concerned about the safety hazards of storing more nuclear waste. AECB was frequently investigating spills that occurred at a Dennison mine site (Elliot, g). Some felt that their health and the health of their children should not be placed at a further risk by siting the LLRW (Elliot, h). Seniors in particular expressed some concern about health hazards to their grand children (Elliot, h).

Transportation

The final CLG report indicated that some residents felt that it was unconscionable to spend thirty-four million dollars trucking wastes from Port Hope to Elliot Lake. People were particularly concerned about the possibility of a spill occurring during transportation (Elliot, h).

Tourism

Elliot Lake is known as a "Jewel in the Wilderness". It is situated in the centre of Ontario's mid-central prime tourist area which is home to some of Ontario's best hunting and fishing areas. Within fifty kilometres of the town's centre there are several tourist outfitter camps and a provincial park. A nuclear museum is also an important tourist attraction in Elliot Lake. A history of the town, as well as a history of the mines and the nuclear industry in Canada, is displayed in the museum.

The town's economic thrust at the time of the siting process, was tourism and a retirement living program which were deemed as not fitting in with a waste facility and not in keeping with the town's planned diversification strategy. It was believed that if seniors learned that the

municipality was even considering a low level radioactive waste dump, that would be enough to make them look elsewhere for a retirement home. The town was trying to downplay the image they already had as being a producer and storage location for nuclear waste products in the form of mining tailings (Elliot, a).

The local newspaper reported that of all the reasons that could be made for saying "No" to the proposal to locate a LLRW facility, the strongest were timing and image. It was considered important for Elliot Lake to protect the image that it had cultivated in order to attract the senior population. There were fears that even the process of examining a proposal to site a LLRW facility could jeopardize the town's major economic draw (Elliot, e).

There was also a fear that some of those presently living in Elliot Lake might leave and the town could ill afford to lose more people. In fact, the municipality was considering promoting cottaging to lure more people to the area (Elliot, a).

Property Values

A fear of depressed property values resulting from the construction of a LLRW facility was expressed at open houses (Elliot, b).

Trust in Government

At a local club meeting, concern was voiced about the AECB's effectiveness because of the way the Sorority members perceived the mining companies as having avoided their responsibility to the environment in many instances (ie. care of mine tailings) (Elliot, f). At the time, Denison mines were nearly bankrupt and trying to get decommissioning which meant that the government may be once again taking over. There were fears that if and when the government takes over that the tailings would be poorly attended.

A long time resident of Elliot Lake who attended a presentation on low level waste felt that the biggest problem was that people mistrusted the government and felt that their own wastes (ie. tailings) were not being well managed (Elliot, g). There was also disbelief on behalf of the CLG that the government could follow through safely with the project. One CLG member described the process as an expensive sham and stated that she believed that she was selected to be on the CLG because she knew nothing.

Although the CLG felt that the town had the skills to do this project, there were concerns that not enough local jobs would be created. In Lewiston (an American LLRW facility), the community was told that many jobs would be created and in the end most jobs were contracted out. In Elliot Lake in the beginning, most of the people were lead to believe that if Elliot Lake were to accept the waste it would create numerous long term jobs, when in reality it would create only one or two permanent jobs (Elliot, D, G). In fact close examination revealed that most of the jobs would be for truck drivers (Elliot, G).

Many felt that the Federal government was not prepared to give its full support and they would not follow through with this project to completion (Elliot, C). However, the CLG members believed the STF's assurances that they could back out at any time (Elliot, D).

Potentially Affected Communities

This did not become an issue.

Impact Management

For most, compensation was a big issue. Benefits were not seen as bribes (Elliot, C,D). One CLG member stated that compensation for her was not a big factor as it was always a veiled presence and thus, there was no idea of what would be offered (Elliot, G).

Those in favour of a facility saw some potential benefits. They included new business, short and long term job creation, an expansion or rebuilding of existing highways, and an opportunity to get vacant housing occupied and more stable prices due to increased occupancy. Elliot Lake was interested in the potential positive environmental impacts that could result from hosting a LLRW facility. They hoped that a compensation package would include a rendering of the already existing local arsenic and other chemicals stable, proper containment of radioactive wastes, possible removal of uranium and other recyclable material and the development of expertise in dealing with waste.

The former Elliot Lake mayor, said that the process must be approached cautiously. He stressed that the few permanent jobs and tax subsidies pledged by Ottawa just were not enough. In return for agreeing to store nuclear garbage, other offsets would be needed, probably including funding for a nuclear waste management lab (Elliot, g). He also felt that if one knew now what the town could negotiate for it might make sense to proceed (Elliot, A). The approach of "let's decide if we want the waste and then discuss compensation" was thought to be fraught with risk. The mayor felt that the STF should tell the community up front what the benefits would be. Otherwise, the process could lead anywhere or nowhere (Elliot, H).

People didn't see any front end benefits and the tail end benefits seemed small (Elliot, C). Negotiating compensation after a decision did not make good business sense to the former or present mayor (Elliot, A, H). This contrasted with the retirement living program where they could see the benefits by calculating how much each senior would bring into the economy.

Ethics

One CLG member felt that the scenario of nine Northern, isolated, one-industry, have-not communities who early in the process established community liaison groups, spending so much time and money in order that sums in the range of \$500 million may be spent at Port Hope, struck her as unwarranted and a little bit sad. She stated that Port Hope would be the big winner and one of the nine Northern communities might negotiate some "crumb as a sop for receiving the low-level radioactive waste from Port Hope" (Elliot, i). The feeling that this was a north/south issue was shared by many (Elliot, C, E, H). Other community members felt that the poor have not communities who participated in this opting for cooperation process were induced to do so for no other reason than the hope of economic benefit (Elliot, h).

It was felt that there was enough LLRW in town (Elliot, h). People opposed to going to the fourth stage of the process suggested that the government save taxpayers money and house the LLRW in Port Hope as they had benefitted from the industry that produced the waste (Elliot, h).

As a result of the siting process there was an increased awareness of public concern over the implications for future generations of radioactive waste disposal (Elliot, h, G, F). There were concerns that there would be negative impacts on the environment if failure to contain the waste occurs, thus affecting perpetual care of the site for future generations. Whatever the outcome, it was thought that profits should not be considered at

the expense of irrevocable damage to the environment (Elliot, h).

The final report by the CLG spoke of the historical wastes of Port Hope being more than a local problem. The CLG stated that the energy produced by Port Hope went to satisfy the demands of the greater population. While the responsibility for the resultant wastes may seem to fall upon a few entities or communities, in fact the effective management becomes a burden upon the entire nation (Elliot, h).

Petitions/Referendum

A businessman from the nearby town of Blind River offered five hundred dollars to the person who could get 5000 signatures on a petition protesting bringing the waste to Elliot Lake. He indicated that he did not trust the CLG (Elliot, j).

Heading into phase four there was a lack of agreement among the CLG members. They were split with three in favour, three against and three uncertain (Elliot, k).

An unscientific survey conducted by The Standard in mid-March, 1990 revealed 98.4 % of callers were opposed to continuation in the process. One hundred and two callers called the office to register their vote. Some of their comments were: "I refuse to let Elliot Lake become a garbage dump", "The transportation is not safe", and "It is not fair to seniors who came here". One commented that "even if I have to work away, I want to make my home here, but if they bring it here I will move; it will destroy Elliot Lake". Another expressed a fear of becoming a dumping ground for other communities and that it would be awful to have a reputation as a waste dump. Furthermore, it was thought that those in the north deserve more than garbage from the south. One resident stated: "we need industry and not garbage, enough is here, what will they bring next?" One of the two yes callers said: "We need jobs here and we can't see any harm in it as we are sitting on a uranium site". Another said that it was "taking advantage of a community that is having problems". (Elliot, l).

On April 30th, 1990, the Community Liaison group presented a carefully prepared and professionally assisted survey of 600 of the town's people in which 67.7 % indicated that they believed that the town Council of Elliot Lake should proceed to the fourth stage of the siting process (Elliot, n). The major findings were that 55.4% included in this study felt adequately informed, 63.0% were satisfied with the CLG efforts to inform the public about LLRW. The most effective information methods were newspaper adds which were read by 66.3% of respondents. The group presentations (6.1 %) weekly meetings (4.2 %) and the open house (2.6 %) were the least effective ways of informing the public.

This study also revealed a statistically significant relationship between the respondent's personal feelings about the adequacy of information and the respondent's desire to go to the next phase. In other words, if a person felt that he had received adequate information, he would be more likely to agree with the suggestion that Elliot Lake should move to the next phase (Elliot, o).

Although some community groups and other organizations came to council voicing strong opposition to proceeding to fourth phase, the CLG told council there was enough interest to continue to the next phase. More than thirty residents marched to the town hall on the night of the vote with slogans such as "Save our Town, turn phase four down" and "we do not want Port Hopes Radioactive toxic waste" and "we say no to LLRW" (Elliot, p).

On Monday June 11, 1990, council voted against proceeding to the fourth phase (Elliot, p). Only one counsellor was interested in going ahead; he felt that they should find out about the benefits package and that since Elliot Lake already had ninety per cent of the waste, what would one percent more be as long as the benefits were there to compensate. He was also interested in getting perpetual care for the tailings. He didn't think that bringing in waste would seriously harm tourism as he declared that some of the biggest attractions in the country are the atomic energy plants (Elliot, r).

In a letter to siting task force member, Dr. Maurice Ruel, the Mayor explained council's reasons for opting out of the process. He said that the town was in the process of implementing an economic diversification and development strategy which must be acted on immediately. This included developing a positive marketing image for the town; an image which could not be associated with the unknown element of waste disposal and management. It was felt that hosting a LLRW facility would hurt the retirement living program, tourism and the economic development of the town (Elliot, q).

Siting Process Concerns

The CLG chairwoman pointed out that the 16 weeks for the community Information Program was insufficient as it did not allow enough time for the report to be written (Elliot, s, D, F, G). It was recommended that the STF should send someone to the community who could easily discuss economic and health issues (Elliot, h). Technical information was found to be overwhelming for nontechnical types (Elliot, h). In the CLG's final report it was also mentioned that the CLG was affected by the personalities and abilities of its members (Elliot, h).

During an interview, a CLG member said that the process needs to have more broad based representation and a term of reference for each candidate so they are clear on their roles. Also needed is a time line for education. There was too much technical information coming too quickly and it was considered too hypothetical (Elliot, B).

Initially the STF said that there was minimum risk and that there was going to be compensation. It was felt that the STF should not be saying that any community who agreed to host this would be better off afterwards because the whole premise should be to solve a problem (Elliot, B).

Recommendations

The majority of CLG members felt that the most residents were in fact comfortable with the communities' ability to skilfully and technically accommodate LLRW if there were no adverse effects (social, environmental and public health and safety). It was the opinion of the majority of CLG members that the residents felt that further investigation of the siting of LLRW materials and potential local economic benefits should be pursued.

Sometimes it was difficult to separate interests and develop group dynamics with many CLG members representing certain groups. During the first two to three months group dynamics were in conflict (Elliot, C). This was one of the reasons why terms of references were suggested. It was also said that being paid made CLG members employees of the process with no long term commitments of money to conclude process (Elliot, C).

The CLG indicated that they were not given enough information and budgetary guidelines. In addition, it was felt that a cost/benefit analysis should have been carried out (Elliot, C).

Several CLG members commented that the process was very educational (Elliot, c, E, F). The principle of public involvement in the process was applauded (Elliot, c, E, D).

The mayor felt that the process was fundamentally flawed as the recommendation coming from the CLG was not binding because the CLG is not one of council's committees (Elliot, H).

In the CLG's final report, it was concluded that the process was worth it as it had raised the community's awareness of the safe management of their own LLRW (Elliot, h).

Appendix E

Geraldton

Motives for Involvement

One of the main reasons Geraldton went ahead in the first place was that there was a lack of public opposition. Another incentive for involvement was that the process provided the CLG with studies that they normally couldn't have afforded.

The CLG chairman felt that the underlying reason for Geraldton going onto phase four was for the potential economic benefits which could be achieved as a result of this type of facility being located near Geraldton (Geraldton, b). The community had suffered the loss of gold mines, government offices and forestry operations in the past, with no new employment in sight. In addition, the threat of curtailment of operations at Kimberly-Clark heightened the degree of uncertainty somewhat and the desire to stabilize it through other growth measures. It was felt that the community needed to take advantage of this opportunity to gain jobs since not too many opportunities had presented themselves since the mines closed. Geraldton was looking for economic stability and saw potential growth benefits and possibilities for community development with this project. The CLG recommended going into stage four based a general consensus among CLG members that the project could be carried out within an acceptable level of risk (Geraldton, c).

Involvement Patterns

Overall meetings were not well attended (Geraldton, A). Later on, an opposition group formed that named itself the STOP group. This group included participation from three local native Indian bands who at one point demonstrated against the process (Geraldton, A). The individual who started the STOP group came from outside the community (Geraldton, B).

The STOP group focused on the danger elements of a LLRW facility (Geraldton, B). STOP believed that the waste was high level and they had doubted that the government would follow through on this project to completion and do it safely (Geraldton, B).

Some people became personal and refused to do business with some individuals based on whether they supported the hosting of the LLRW facility (Geraldton, A)

Environmental Suitability

Geraldton's residents voiced concerns over lake, river and groundwater contamination. The biggest hurdle however, was an Indian land caution that took much of Geraldton's land out of consideration. Geraldton applied to have a portion of land annexed for a potential LLRW facility. Annexation was necessary because there was no appropriate area for a LLRW facility inside the town's jurisdiction (Geraldton, B).

The CLG's activities in the fourth stage of the process were only maintained on a very minimal level pending a decision by the Ontario Municipal Board on the proposed annexation of lands that might be considered suitable for assessment by the STF. The STF was unable to authorize and carry out the required field investigations and technical studies until the land that Geraldton wanted to use for a low-level radioactive waste management facility had been annexed. Geraldton's CLG in conjunction with Siting Task Force Secretariat Staff had concluded that at

least a twelve month period was required in order to adequately address the site selection process prior to any referendum. Overall, these deadlines placed unmanageable constraints on a viable schedule for applying the Co-operative Siting Process successfully in Geraldton. There was insufficient time for the CLG to produce a technically credible and an environmentally defensible report on which the public could make an informed decision in the referendum (Geraldton, g).

Geraldton's CLG therefore recommended withdrawing from the process. On recommendation of the Geraldton CLG, council voted unanimously in favour of opting out of the process

Risk Perception

In the CLG's final report there was mention of fears of contamination of the water system, wildlife, fish and woodlands (Geraldton, e).

A survey carried out by the Speakers Committee formed from CLG members indicated that the residents who attended at least one information session were more receptive to continuing in the process. In total 360 attended these sessions (Geraldton, i).

Health and Safety

Concerns were expressed that a leakage of radioactive materials would cause cancer or genetic defects (Geraldton, e). Concern was expressed about the effect on future generations and worry about things being carried on in the genes (Geraldton, C).

Transportation

Geraldton is remote when the distance to large urban markets is considered. Thunder Bay is 290 kilometres away and other larger Ontario urban centres are more than 1100 south. This is a major limiting factor for development activities such as conventional manufacturing and commercial wholesale operations which require ready access to markets. A branch of C.N. is located towards the north end and the town is situated on Trans Canada Highway number eleven.

Many felt that the waste should be stored as near to the site as possible to minimize the possibility of contaminating other communities on the transportation route. (Geraldton, d).

Some concern was expressed for the costs to be borne by the tax payer for long distance transportation charges (Geraldton, d). Transportations cost were estimated at \$75 million. (Geraldton, e).

In the beginning little concern was given to the transportation issue, but then other communities started to show opposition (Geraldton C).

Tourism

The tourist industry is limited in its scope of development (very remote, high transportation costs, very seasonal - only May, June, July, activities focus on lakes and natural landscape). There are only a few tourist developments (Geraldton, a). Despite the limited scope of tourism, concern was still expressed about possible negative effects the tourist industry (Geraldton, e).

Property Values

There was no mention of this.

Trust in Government

Geraldton residents spoke of a lack of trust in government agencies and a feeling that they are withholding information or not telling the whole truth (Geraldton, B, e). There was a general distrust of health studies done by federal agencies who are perceived as having a vested interest in making adverse health effects seem minimal (Geraldton, e).

Some members of the public were sceptical as to whether the wastes were actually all low-level and suspicious as to whether other toxic materials would be mixed in with them (Geraldton, e). People questioned their obligations if they were to host a facility ie. would they end up being a candidate for high level too? (Geraldton, B). There were also concerns that once the site was decommissioned that the government would walk away from all responsibility (Geraldton, e).

Potentially Affected Communities

Surrounding communities worried that their tourism trade would be affected (Geraldton, e).

Some of those living at Wild Goose Bay (near the site under consideration) did not want annexation as it could increase property taxes (Geraldton, B).

Geraldton's CLG hired a consultant to help them develop a plan for better informing and involving the native population and first nation representatives in their work. This consultant also focused on how to integrate the needs of the youth population into the studies and activities underway (Geraldton, e).

Impact Management

Mitigation and compensation were considered very important (Geraldton, B). In fact, the Town of Geraldton was asking for an equity compensation in the amount of 10% of the waste facility costs. Benefits in terms of jobs and retail economy boom were viewed to be temporary and short lived (Geraldton, e).

The town wanted buy out assurances to protect against the devaluation of surrounding properties. Local hiring and training practices and local purchasing were also stipulated (Geraldton, e).

Ethics

From an ethical/moral point of view, the community felt that because they had benefitted indirectly from the radioactive substances produced at Port Hope, in terms of energy produced and medical applications, it is only fair that they assume some responsibility. They believe that there is an obligation to share what they have in terms of large tracts of unused land in unpopulated areas in terms of being good global citizens (Geraldton, e).

Another opinion that was frequently expressed was that the communities who derived the economic benefits from processing the ore should assume the responsibility and dispose of the wastes in their immediate vicinity. "Why doesn't Port Hope keep it?" was a common question (Geraldton, A). The waste disposal problem was viewed as a part of the greater problem of imbalances of political, economic, and social resources which have traditionally resulted in the South dictating the nature of development in the North (Geraldton, e). For some it was definitely a North/South issue (Geraldton, A, e).

The community mentioned reservations about making a decision that is intergenerational in nature

(Geraldton, e).

Petitions/Referendum

At a CLG meeting on December 9, 1992 a local resident, presented a petition to the STF chairman with 1300 names (900 of which were in town people) and 74 letters that were ignored by council (Geraldton, f).

Siting Process Concerns

The mayor felt that the major flaw with the process was that it was undertaken by council before public consultation occurred. People became concerned about the money being spent and the work going forward before they had been asked to vote and they became more and more nervous (Geraldton, B,C). It was felt that money should be used to put the material in a safe place near its source (Geraldton, C).

Council chambers often became a battleground and the waste issue took up a great deal of council's energy (Geraldton, C).

Concerns would be answered at CLG meetings but it was difficult to prove to people that there was no danger. It is complex information to explain because of the technical language and the jargon. This difficulty to communicate was the a major limiting factor. Some residents felt put down when asking questions and some resented what they perceived as "Ottawa people walking in and acting like know it alls" (Geraldton, C).

Recommendations

One CLG member commented that he had enjoyed the process and found it very educational and open. He felt that it was fair and that people were there to help them, although, not as quickly as he would have liked (Geraldton, A). One CLG member commented that they were given sufficient information, and there were always opportunities for accessing information (Geraldton, B). The process was described as cooperative, voluntary and very personal due to good interpersonal relations (Geraldton, B).

Given the duration of the process, it was recommended that in future, CLG membership should continue to be approximately twelve to fifteen people in order to allow for vacancies and/or replacement members (Geraldton, e).

The town's previous mayor suggested that the STF should try to give the facility a different name as the term "radioactive" scares people off. He also felt that they needed people who were better communicators as it is difficult to explain such a complex subject that has a built in fear element (Geraldton, A).

Appendix F

Port Hope

Motives for Involvement

Some Port Hope residents complain that they have been burdened for years and they believe that the government is obligated to clean up their town. Since the federal government took responsibility for the waste, Port Hope feels that they should not be forced to keep what waste it has or take any more (Port Hope, D). In contrast, others feel that involvement now is their last chance to clean up their town (Port Hope, C). One resident indicated that there had been a lot of public support and that a decision had to be made as this would be Port Hope's last chance to deal with the waste (Port Hope, B). Another believed that if Port Hope did not volunteer to host a LLRW facility that in the end nothing would happen (Port Hope, F).

During the process, it was recognized that there may not be any outside volunteer host community willing to take the historic LLRW from the Port Hope area waste communities (Port Hope, b). After Port Hope's CLG visited Geraldton, and observed the problems they were having with native land claims, they came back with the feeling that they were going to have to look in their own backyard to solve their LLRW problem. It appeared unlikely that Geraldton would host a LLRW facility and that only left Deep River as a serious contender for a LLRW facility (Port Hope, A). The CLG feared that Deep River would cancel their volunteer status and then the process would fail. One resident with connections in Deep River informed the CLG that a petition had been signed by 1000 people in Deep River who were protesting its host community status. It was also noted that Deep River's town council had agreed to study the petitions and address the concerns (Port Hope, b).

Port Hope's CLG chairman did presentations on average every six or eight weeks hoping to convince council to volunteer to be a host community. Much to the CLG's chagrin, Council paid lip service and politely said thank-you at the end of each presentation but, never followed up (Port Hope, D).

Town council had its own agenda. To handle Port Hope's waste problem, the mayor at the time, Betty Collins decided to work from outside the siting process, and go through political channels by approaching the Minister of Natural Resources Canada. Council felt that they could successfully sue the government and hired two consultants to help them address the LLRW issue from this angle (Port Hope, B).

In contrast, the CLG felt that this would not solve anything. Instead, they believed that opting out of the process would mean that the other two sites, Port Granby and Welcome would get cleaned up first as, they already had decommissioning orders. It was expected that the end result would be that it would be many years before Port Hope would be cleaned up (Port Hope, B).

It took the CLG a year to convince Port Hope town council to change their status from source community to volunteer host community (Port Hope, B). Council became tired of hearing that Deep River would likely drop out of the process thus, leaving Port Hope saddled with the waste indefinitely. When Deep River's CLG resigned en masse, thus affirming the CLG's worst fears, Port Hope's council felt that they had to take a good look at the issue (Port Hope, B).

There was also pressure from Port Hope residents who felt that this was a Port Hope problem and therefore, it should be dealt with by the town and not by relying on outside communities (Port Hope, B). Over the six years that the process evolved, the CLG found that residents of Port Hope were leaning away from demanding that the waste leave town and more accepting concerning keeping their own waste, and some acceptance of taking all the waste. It was thought that over time, emotion had dropped off. As the CLG became more technically informed so also had the town of Port Hope. People began to understand more about the process and they responded with less of a knee jerk reaction (Port Hope, B).

Although a site out of Port Hope would have been preferred, it was thought to be unrealistic (Port Hope, a). If the task force was unable to find a place for the Port Hope waste, ultimately they were willing to look at finding a place for their own waste in Port Hope (Port Hope, B).

Finally on October 7, 1992, Port Hope council put forth a resolution to be a host community. However, the resolution carried several provisions. They included a requirement that Port Hope's waste have priority over all other waste, that the government build a new small craft harbour and that compensation be determined in consultation with input from town residents and council. The mayor described the local waste sites as an emergency situation and demanded that interim waste management be carried out at select waste sites in town. However, this request was denied. The STF felt that conducting interim waste management activities at this stage of the Siting Process could lead to confusion as to the message that the federal government was sending out. It could be perceived to be in conflict with the Task Force's mandate to find a solution to the decades-old problem posed by the historic wastes (Port Hope, g). Moreover, the task force could not on behalf of the Federal Government agree in advance to whatever compensation package council requests. As a result of the STF being unable to meet Council's demands, Port Hope was not recognized as a volunteer community.

A new town council was elected in November of 1994. This council claimed that the waste was one of their top three issues but unlike the previous council felt that volunteering to be a host community was the surest way to take care of it (Port Hope, A). Their motivation for involvement was that they saw it as a chance to take control of a solution to their problem where they have thirteen major LLRW sites around town and more than two hundred small pockets of waste. It was expected that the problem was even more far reaching as some people would not allow the low level waste management office people in to assess some areas that were commonly known to be hot. Until they are sold and someone allows them on the site they will not be included in the count (Port Hope, D).

At a CLG meeting, one CLG member declared that by staying in the process that they would be getting the problem looked after and that a solution was in sight. A local resident stated that he felt that Port Hope suffers economically because of the presence of the waste (Port Hope, b). Another described Port Hope as a cute little town, but, a dying cute little town in need of a revitalizing project (Port Hope, F).

The people of Port Hope wished to retain control of the clean-up program in their community and as a consequence the CLG recommended that, it (the CLG) be continued for the entire life of the siting process. The CLG also requested that the criteria for selecting a site and for the clean-up of the wastes in the town be developed by the Port Hope Community Liaison Group jointly with Siting Task Force. In stage three, in a CLG report to council, the public were said to see hope

in the new cooperative process instituted by the federal government. Furthermore, they state that cleanup has been delayed too long already. One CLG member explained that the citizens of Port Hope are sick of studies - they want the government to act now and get results (Port Hope, b). The impatience in the title of their report, "Let's Get On With It", truly reflected what people told the CLG (Port Hope, c). There were also many comments telling them to get on with it at the Fall Fair in 1993 (Port Hope, a, d). Some felt that they had been "studied into the ground" (Port Hope, e).

Cameco (A Canadian Mining and Energy Corporation; formerly known as Eldorado), the original producer of much of the historic waste, indicated an interest in becoming become involved in this issue. Basically they were looking at becoming the proponent (ie. managing the facility and using it for co-disposal) (Port Hope, D). Cameco already has a moral, ethical, historical and financial obligation to find a solution to the LLRW. More specifically they have a twenty-three million dollar commitment to take care of LLRW as requirement arising from the time they purchased the Cameco plant from the federal government. If the process fails, this money will go to the urgent decommissioning orders in Clarington and Hope Township. Only if there was funding left, would the clean-up of Port Hope commence (Port Hope, j).

Involvement Patterns

The CLG believed that this process had a better chance of working in Port Hope because it is a small town. It was felt that it would be a difficult process to make work in a large centre where it would be even more difficult to reach everyone (Port Hope, B).

At an open house, approximately a quarter of the people said that they do not care about the waste. Approximately ten per cent of those polled in a telephone interview didn't even seem to know that the waste existed. The CLG concluded that it is obvious that there is a segment of the population who won't be reached (Port Hope, B, D). The CLG chairman feared that it would not be until the end of the process when people realize that trucks may start rolling by their doorsteps that they may begin to get involved (Port Hope, B).

In Port Hope, there is usually a twenty-five per cent election turn out, however, at the last election, the turn out was fifty-seven per cent. This was attributed to "the waste" being an election issue. All the people who ran for office had "the waste" as an election issue because Port Hope residents want to see the issue resolved (Port Hope, B).

At the conclusion of phase three, Port Hope's CLG recommended that Port Hope proceed to the next phase to find a permanent site for Port Hope's low-level radioactive waste. Although references had been made by all parties confirming the CLG's position as a volunteer community, it still remained that the resolutions put forward by Town Council did not clearly define Port Hope as a potential Volunteer Host Community (Port Hope, i). Therefore, the siting task force was forced to continue viewing them as a source community in spite of the fact that the CLG had recommended volunteering.

An ensuing impasse which occurred between the STF and council in regard to the interpretation of the Resolution passed by council on October 6, 1992 resulted in virtually no meaningful contact between the Task Force and Council for over a year, despite the fact that both bodies were striving for the same result - a permanent solution to the problem of historic low-level waste.

To encourage council to declare volunteer status, the CLG Chairman wrote to council explaining that recently there had been published reports indicating mounting opposition in Deep River and in the surrounding municipalities, to the proposal to move the radioactive and chemically contaminated historic waste. They reminded council that the siting process ends at anytime with Deep River opting out before or on March 31, 1995 and therefore it was imperative that action be taken immediately (Port Hope, q). The CLG was also concerned that the delay in clearly declaring the Town of Port Hope a potential Volunteer Host Community for the historic low level radioactive waste may jeopardize receiving the necessary approvals required to initiate an environmental assessment.

The CLG continually reminded the mayor that the CLG was adversely affected by delays (Port Hope, p). A past CLG member and present counsellor stated that the CLG was unable to operate effectively without knowing if they were a host community or not. He also stated that the reason why council had not passed a resolution to be a host community, was political. In addition, to the two levels of government directly involved there were many people with vested interests such as Cameco employees, and all the people who work on reports (ie. consultants). It was suspected that council believed that if a resolution had been passed that the federal government would have delayed and dragged this process on for as long as they wanted and "not one shovelful of interim management" would have been undertaken (Port Hope, f).

The CLG tried to help Council by preparing a draft resolution that would not be ambiguous. They also tried on many occasions to set up a meeting to discuss this. Council did not reply as they were waiting for a consultant's report before determining what they would do (Port Hope, p). From the mayor's perspective, it appeared that the government was wasting twenty million dollars on a useless study on where to move radioactive waste when the town had already decided that it should be left where it was and managed in a licensed site. This attempt to deal directly with the STF was viewed by the CLG as Council ignoring the role of the CLG and circumventing the process (Port Hope, r).

The mayor's perspective was that the CLG was not supporting council's efforts. She stated that if things did not turn around that she would recommend to council that the CLG be disbanded and cease any activity with the Siting Task Force (Port Hope, r). This obviously did little to improve relationships between the two groups (Port Hope, s).

Finally, on September 26, 1994, the Council of the Town of Port Hope finally passed a resolution confirming their desire to proceed with Stage 4 of the site selection process as prescribed by the Siting Task Force on low level radioactive waste, in the same manner as Deep River. Inclusion of Port Hope as a potential volunteer community at this late date had major consequences for the program. Technical work in Port Hope had to be redirected and accelerated. On December 7, 1994, Council in Port Hope asked for an extension beyond March 31, 1995 which was the scheduled final reporting deadline of the STF to cabinet to allow the appropriate amount of time for the task force to perform their research. The extra time was also necessary to allow the CLG an appropriate timeframe to inform the people of Port Hope so they would have all the required information to make an informed choice.

On February 13, 1995, council specified that their voluntary status would apply only to Port Hope's waste. Later in the year (late September, 1995) that resolution was rescinded and Port Hope stated that they were volunteering to take all the waste.

An open house on "Options" for Port Hope as a potential Volunteer Community was held in early December, 1994. More than 200 residents attended. There was much discussion among councillors, and attempt was made to table the resolution which subsequently passed 8-1 (Port Hope, j).

Around the same time, Cameco expressed a desire to also support the Process in Port Hope actively and visibly. Cameco stated that they were willing to provide access to a site under their Port Hope plant or on their property. Cameco also appointed a Port Hope resident, as the official co-ordinator for Cameco on STF matters (Port Hope, n).

Cameco preferred the mined cavern technology for environmental safety and technical reasons. This technology was also the only one that the AECB would endorse. However, the CLG was previously led to believe that they could select the technology for the project. Initially, the CLG was considering some above ground storage options in regard to Port Hope's waste in mounds. The AECB statement of preference for deep cavern burial upset the Hope Township Community Liaison Group which preferred surface storage of any waste because of the ease of future access (Port Hope, t). This late proclamation meant that all the work done by the CLG and the feelings of the community meant "diddly squat" as the technology choice had already been decided. This decision destroyed a lot of the trust that had been built up under the opting for cooperation process (Port Hope, B).

The CLG was given a free hand in giving presentations to the public. Small presentations were made to groups and some workshops. Attendance was generally poor (Port Hope, B). In addition, the CLG developed a mailing list of those who showed an interest and sent them information regularly - there were 300 on the list (Port Hope, B).

There was an open house to explain the potential sites and the technology choices. Only 212 people showed up in response to 3000 personal calls to households inviting them to the open house (there are 5000 households in Port Hope). In addition, every household received a flyer door to door. There were a lot of people who indicated that they read the paper and keep up on the issue and therefore, felt little need to attend an open house (Port Hope, D).

Most Port Hope residents are concerned about this issue. They believe that regardless of what happens with the siting process that the government has an obligation to clean up this waste (Port Hope, B). Before finally withdrawing from the process in the summer of 1995, members of the CLG couldn't go to the grocery store without being stopped and questioned by three or four people. It was discussed everywhere - usually the first question was: "are we going to get this waste cleaned up?" (Port Hope, B).

Environmental Suitability

Many residents were concerned about the preferred technology and location option which was putting caverns going under the lake. However, from a scientific point of view, it seemed like a good choice. Port Hope's geology at the lakeshore is the best possible for the development of underground caverns (Port Hope, J). The groundwater at the proposed level for a disposal cavern is many times saltier than sea water, suggesting that it is static and has been there for tens of thousands of years (Port Hope, a). This indicates that this would be a very stable place to entomb the waste. Furthermore, the rock structure in the area is ideal for an underground cavern. Most CLG members felt assured that a stronger guarantee of safety could be given in Port Hope than

Deep River because the geology at the beach beside the Cameco plant is ideal for caverns. Many believed that it will never leak (Port Hope, B).

Other proposals under consideration included a site on Highland Drive (situated near a school, sports complex and in the centre of family dwellings) for an above-ground mound or an underground cavern facility and a site on the lakeshore near the Waterworks for an underground cavern facility.

The clean up of Port Hope's two major sites is a challenging prospect. The harbour presently contains a great deal of waste which originated from Cameco (formerly Eldorado) over the years. Cleaning up the harbour will be a challenge; if cleaned up wet, wastes may end up dispersed and if it is drained and dried, a lot of dust will result. The CLG recommended that the Government of Canada consider development of a new harbour in Port Hope as a demonstration of Canada's commitment to the environmental integrity of the Great Lakes and as compensation if Port Hope had agreed to host a facility (Port Hope, D).

The landfill site contains LLRW mixed together with thirty years of municipal garbage. One suggestion was to isolate and clean up as many hot spots as can be found and then try and protect the rest. The other option was to dig up and remove everything. In any case some action was necessary as contaminants were seeping into the groundwater, primarily from the landfill site and there was also a plume coming down (Port Hope, D).

It was estimated that it would take at least one year for the task force, Council, the CLG and the residents to obtain adequate information and analysis regarding possible sites in Port Hope that are technically, environmentally, economically and socially sound. Such information was essential in order to ensure a properly informed public before undertaking a community referendum. A member of the STF Secretariat felt that if the volunteer communities were rushed, they could be rushed right out the door. On the other hand the source communities were more impatient. They had been involved with the problem for a long time and they just wanted a solution. Meetings between source communities and volunteer communities helped develop a meeting of the minds.

Risk Perception

Port Hope's mayor for the term before the 1994 election, was shown on the front of the paper saying that the town was in a state of emergency; and that the LLRW waste needed immediate attention. However, the LLRW Management Office conducted a site survey and concluded that all of the nine major sites were safe although they could be managed somewhat better - hardly an emergency situation (Port Hope, D).

In March 1993, the Community Involvement Committee did a Public Involvement Needs Assessment as part of phase four with the long term objective of identifying areas of agreement and disagreement within the town of Port Hope. The first stage was data collection by trained interviewers. Although not a statistical survey, this questionnaire filled out by sixty people provided information on some of the opinions and perceptions of a cross section of the community. From this it was hoped that an awareness activity program would be developed to deal with concerns expressed by the public. The survey reported that the low-level radioactive waste was considered to be the most negative or serious Port Hope problem and it was described as a "cloud hanging over the town's head." Other concerns came from current economic situation, unemployment, municipal politics, lack of leadership, taxes, and the poor state of the waterfront

(Port Hope, u).

There was a great deal of resentment over the waste in Port Hope. People were fed up, mistrustful and bitter over the LLRW. Many felt that it was bordering on criminal that the LLRW was distributed in such a haphazard way throughout Port Hope. However, some of the blame fell upon Port Hope residents. Years ago, trucks leaving Cameco with sludge to go to Port Granby were sometimes diverted and a half load would be used by someone who was installing a driveway for instance. People also used the ash from the stack for their gardens (Port Hope, B).

One CLG member stated that if Port Hope had held a referendum that there was no way Port Hope would agree to accept other's waste. "We are NIMBY of the worst order. With neighbourhood rivalry you just don't want to let Hope Township and Clarington not make a sacrifice" (Port Hope, A).

Health and Safety

The major concerns reported by Port Hope residents at the 1993 Fall Fair were health and safety, environment, air quality/dust, radon gas and ground water (Port Hope, d). Many people can't understand why a LLRW facility is being considered for a municipality. They think it should be located very far from communities. They ask "why not in less populated areas?". This was difficult for the STF to explain.

A questionnaire in 1994 revealed that forty-eight answered yes and three said no to the question: "if a decision were made to retain historic waste isolated in a properly engineered and monitored facility within your community, would you feel confident that your health would be adequately protected?". Another belief was that development would be retarded if the LLRW stayed in Port Hope (Port Hope, v).

At another open house, eighty five questionnaires were filled out. Most people indicated that they had found out about the open house from the newspaper or a flyer that was distributed to homes. Some of the comments were that there was not enough updated information on birth effects and cancer and health information was not as complete or as candid as it could have been (Port Hope, a).

Many residents feel there have been health effects covered up over the years (Port Hope, E). They state that the health of the community has been affected based on anecdotal stories. If you ask if they know someone personally, they say no. On a questionnaire where fifty-one people answered the question "is the present low level radioactive waste a health risk?", thirty-two said yes and nineteen said no. When asked if the historic waste has affected the health of you or any member of your family, four said yes and forty-three said no. Obviously, it was a perception of fear that was at play (Port Hope, B). In fact, the health of the community is in line with the rest of the surrounding area.

One citizen believes that health issues were not studied enough and although there is currently no substantial proof of physical harm caused by the wastes, there is a perception of danger. This perception of physical harm can cause psychological stress and result in adverse health effects (Port Hope, b).

Confusing matters is that the government maintains that there are no health effects and yet they feel it is necessary to clean up Port Hope waste sites. This contradiction conjures up fear and suspicion (Port Hope, w).

Transportation

If the waterworks site adjacent to Cameco was selected for a LLRW site there would be the benefit of there being a railway adjacent to it. The only waste that would require transportation through town would be that from the North sites in Port Hope. Nonetheless opinion was divided with a lot of people thinking it was a good option and a lot thinking that it was terrible (Port Hope, B).

Many preferred the landfill site. Unfortunately, two of the three routes to this site would require transporting the material past three schools and a sports centre. To avoid the schools to get to the land fill site which is at the top of a hill would require going up a very steep hill. The noise that would ensue from truck's gearing down would be tremendous. Furthermore, it was calculated that moving the waste would require one truck every four minutes for five years coming into town. Obviously, this would have a tremendous impact on the town's roads (Port Hope, D).

Tourism

Port Hope is considered to be a tourist destination. The tourism appeal of Port Hope is related to its historical buildings, its small town character and the Ganaraska sport fishery. Tourist facilities include 14 antique shops, eight sport fishing charter boat operators, two museums, boat mooring facilities, seven motels and bed and breakfast facilities (219 rooms), two campgrounds and 29 restaurants (Port Hope and District Chamber of Commerce, 1990) (Port Hope, x).

There were some concerns about the LLRW affecting tourism, especially in the summer. The condition of the harbour from the build up of wastes as a result of Cameco operations was hindering some boats trying to navigate the harbour (Port Hope, J). Furthermore, the harbour which includes the Cameco plant was not what one would describe as an attractive welcome point to Port Hope.

Property Values

Port Hope residents maintain that economic opportunities have been lost because of having wastes scattered throughout the town for up to sixty years. Many felt that there is a need to convince residents and newcomers that it is safe to live in Port Hope. A common goal is the removal of the stigma of "the little town that glows in the dark" (Port Hope a).

Trust in Government

Opting for cooperation had successfully brought together the government and people who strenuously opposed the earlier site searches. At the end of phase three, Port Hope's CLG received a bombshell that the STF was disbanding (Port Hope, B). After all the time and effort that had gone into this project, this was seen as betrayal of confidence. Unfortunately, the government procrastinated for over a year before appointing the new siting task force for phases four and five. The process had been in limbo while the federal government was deciding if funding would be made available to continue. A CLG member, mentioned that Port Hope's CLG had been making progress regarding community participation but that they lost goodwill due to the year break in the process (Port Hope, k). Another CLG member commented that phases one through three had been fantastic - the public relations in Port Hope were high but now they had

a big selling job to do in order to get back to that point (referring to the one year loss) (Port Hope, I). During this hiatus, a great deal of enthusiasm and momentum was lost in all communities involved. Many of the people in Port Hope interpreted the government's lack of action as a lack of commitment (Port Hope, m).

When phase four started, new people came on the siting task force and the STF Secretariat was expanded (Port Hope, B). Getting back on track was a challenge. The process was described as very laborious and agonizing in many respects (Port Hope, C).

Port Hope's preference was to have all the radioactive wastes removed from Port Hope. Overall, people felt that there was simply not enough room in Port Hope for wastes from any other places. Responses to a questionnaire at a home show revealed that sixty-eight per cent of respondents would agree to keeping their own waste but only twenty-eight per cent said they would agree to accepting wastes from other communities (Port Hope, h).

The chairman of the siting task force, Dennis Wood, assured the CLG that if a resolution was passed by council for Port Hope to become a host community for only its own waste, it would be accepted by the siting task force (Port Hope, f). This flexibility was an incentive to Port Hope's CLG, especially considering that many people wished only to handle Port Hope's waste. Unfortunately, this decision was later changed with the STF agreeing only to consider a host community who was willing to accept all the historic LLRW.

Potentially Affected Communities

The nearby communities of Port Granby and Clarington stated that not only would they not be a host for a facility, but also, they would specify the manner in which their wastes must leave their towns (Port Hope, D). Both towns insisted on rail transportation for their wastes. This had significance for Port Hope as only the waterworks location, which many Port residents opposed, would then be an option.

A clean up criteria project which was a joint effort between the three source communities ended up as a battle because each community held a different position. The project was to take six months to complete and it eventually consumed two years time and became a battleground. For example, Clarington stated that anything to do with Clarington would be decided by Clarington alone. This kind of territoriality - geographical and/or functional made a difficult situation more difficult (Port Hope, E). The project was seen as a failure; the meetings were described as horrific. The remedial action plan developed by the three communities contained an addendum about interim waste management which was added at the request of town council (Port Hope, B). As indicated earlier, this was not to be part of the process.

Impact Management

The Port Hope CLG began by looking at compensation as a non-issue; rather, the concern was to obtain a resolution for the waste. The CLG chairman for the last two phases stated that the original concept of compensation was that it was not to be part of the game plan. The decision to site a facility was to be based upon health issues. It was felt that if compensation was discussed early on, there would be the risk that perhaps some other impacts such as health and safety would be compromised in return for compensation (Port Hope, B).

The CLG felt that the process was most likely politically driven. On a macro level, the siting

became an issue during the 1984 election campaign when the then Leader of the Opposition, Brian Mulroney wrote to a resident of Port Hope that the disposal of the material was partially a federal responsibility (Port Hope, a11). On a micro level, if someone had of been able to work out a great compensation deal for Port Hope, they could have become the town's hero. This may be why Council wished to keep control of the compensation issue. The question then was, is it still an environmental issue or an economic issue? This change in focus was a problem for CLG members who see this as solely as an environmental issue. For some, compensation is irrelevant compared to solving the problem.

Council also became more interested in the issue once compensation negotiations began (Port Hope, A). Several CLG members felt that Town Council did not care about the waste, rather it was a dollars and cents game because the Town's priority was to get a new harbour (Port Hope, y). Getting the harbour cleaned up had been a long time priority and it was thought to be more likely to occur if Port Hope was a volunteer community rather than just a source community (Port Hope, D). The focus switched from how do we clean up the mess to what can we get for this

The subject of compensation was another example of council and the CLG being on different sides of the fence. Even the chairman of the STF (Dennis Wood) said that there was a perception within Port Hope that council and the CLG were working towards different things (Port Hope, y). The CLG chairman mentioned that the point that is regularly missed in all of this is that for Port Hope, compensation is a clean community and to this end what sacrifices are they willing to make. However, some Port Hope residents felt that there should be some compensation because they believed that there had been some injuries because of the waste (Port Hope, B). Most agreed that accepting waste from outside the community would qualify them for compensation (Port Hope, A).

Some CLG members expressed concern over the boom and bust element of the construction a facility while one CLG member described it as an incredible "opportunity" for any area - as it could yield approximately 247 jobs over several years (Port Hope, a).

In late winter and early spring, 1995, the STF and Port Hope Council began to negotiate a Community Agreement-in-Principle that addressed economic benefits, equity compensation and other community based issues (Port Hope, z). It seemed contradictory to the spirit of the cooperative process that the siting task force only met with council when working out a compensation package (Port Hope, A). The CLG requested that a CLG member be on that committee but council refused. This hurt and disappointed the CLG who had worked so hard on the project - to be shut out at the end seemed unfair (Port Hope, C). Not only was the CLG excluded but, negotiations were held behind closed doors. The STF's concession to the CLG was that there would be a meeting with them once an agreement had been worked out.

Ethics

Many Port Hope residents are third generation Eldorado (now known as Cameco) employees. Eldorado built much of this town; there are very few people in Port Hope who have not had a relative working at Eldorado and have therefore not benefitted from the opportunities that this represents (Port Hope, A). With Eldorado and now Cameco, Port Hope has enjoyed a very good corporate citizen within its town (Port Hope, A).

Many whine and cry how they have been hard done by, but, they voluntarily "borrowed" a can

a paint from Eldorado and then painted something and found that it is radioactive afterwards (Port Hope, A).

Many people in town feel that there is nothing wrong with the waste; it is not hazardous and dealing with the problem is a waste of time and money. In fact, some say it is just a process to create jobs for the federal government (Port Hope, B). Some consider trucking the waste elsewhere is uneconomic ethically because indirectly, it would be taking advantage of the government and an irresponsible use of government money (Port Hope, H). It was felt that Port Hope should not be taking advantage of the federal government in order to make marginal improvements in safety (Port Hope, A).

Petitions/Referendum

A council vote on Feb 13, 1995 revealed that Port Hope was in favour of staying in the process by a margin of six to three. Also on the same date, Council passed a resolution to handle only material inside the Town's boundaries. Council also resolved that it would prepare a list of suggestions for inclusion in the list of equity benefits and name the members of the negotiating committee (Port Hope, C). In August, 1995, compensation negotiations between council and the STF broke down and Port Hope withdrew from the process.

Siting Process Concerns

One past CLG member commented that this process as laid down in opting for cooperation is not really workable without a great deal more discipline to it (discipline in spending and timetables) (Port Hope, G). Taking more care and time in public relations (some of the public relation gaffes were described as "bad") was also suggested (Port Hope, G). Some Port Hope people took offense to people from Ottawa and their attitude in early days towards the local people. Although they were initially told that they were going to have all this input, the feeling was that the process was being controlled from Ottawa. Ottawa people came to every meeting and they kept offering suggestions as to what should be done, almost usurping the authority of the chairman. One CLG member commented that "It is my contention with the STF Secretariat and the STF and the CLG relationship, that the power of the top has overpowered any study and suggestions formed at the grass roots level" (Port Hope, a6).

Part of the resentment had to do with the personalities of those who came. Also irritating was that the Ottawa representatives would fly to Toronto and take a car to Port Hope which many considered extravagant and hard to accept when the CLG was under such tight budgetary restraints (Port Hope, G).

There was a saying in the CLG office that the work is 20% technical and 80% social. The technical people could go out tomorrow and do their studies but they must stay in line with the social aspects. One CLG member commented that community involvement was a priority but technical work was given priority (Port Hope, a1). They also felt that they were sometimes getting sidetracked on issues that were interim in nature (Port Hope, a3).

Some CLG members complained that they sometimes endured some of the most boring public meetings that you could ever sit through. The STF would have highly trained technicians trying to explain a highly technical theory to a group of people off the street. The technical working group was described as one of the most frustrating efforts ever participated in. There was no public involvement, and the committee was too big and it took too long for reviews to be

gathered. CLG members felt that they were struggling with how to perform their function and they were concerned that they were drifting to the technical side rather than providing a liaison with their council (Port Hope, a10). The CLG felt that the STF should have presented a set of choices for remedial plans, instead of involving them in such depth (Port Hope, a).

People complained that they were not being told the things they wanted to know. They wanted to know when the loader would be start digging and not the nitty, gritty, technical details of the process. They were looking for time frames, methods, and they wanted decision. Instead, the CLG spent hours learning about the technical aspects of the project (Port Hope, G).

The STF's emphasis on technology led to the CLG becoming over-involved in the technology evaluations which was not really their role. One CLG member commented that it was good that the STF had the information available for them and it was everyone's choice to decide how much they wanted to learn (Port Hope, A). However, it was the STF's job to manage the information and keep the process on track. The STF recognized that the CLG spent too much time on the technology aspects of everything. A STF Secretariat member advised the CLG that their role was not be technical experts, nor do the technical work but instead to be the experts on interpreting the results in plain language for their community and obtaining public comments on it (Port Hope, a2). This however, was something that required special skills which the CLG members were not required to have. The STF stated that they saw the CLG's role as continuing a liaison role, and providing the STF and the STF Secretariat with support (Port Hope, a9). Overall, there it was felt that there should have been more technical assistance and less time spent doing the work on it; the CLG could have concentrated more on their liaison work, than the technical subcommittees (Port Hope, B).

The CLG had its own set of obstacles to overcome; even the chairman of the STF acknowledged the many struggles that the CLG had to cope with. These included a change in chairperson, new CLG appointments, continued uncertainty as to Port Hope Council's wishes, and different views about hosting the wastes (Port Hope, a5).

The CLG expressed concern that they were not interacting with council enough (Port Hope, a3). They felt isolated and powerless from those on council (Port Hope, A). To help counteract this problem, they decided to make reports to town council in person (to answer questions) every second or third month or as required (Port Hope, a4).

Some members of the CLG attributed part of their loss of credibility with the people of Port Hope to town council who was involved only a sporadic basis. Most aggravating to the CLG was the fact that Council had sidestepped the CLG and failed to consult the CLG when action was being taken. For example, at one point a letter was written to the Honourable Jake Epp, then Minister of Energy, Mines and Resources, inviting him to attend a meeting in Port Hope to discuss the possibility of a quick deal with Port Hope to remove the waste for compensation (Port Hope, b). On the other hand, council may have felt that they were being left out. It is essential that council, the primary decision maker is credible to the community. It comes down to local politics. The process works well, but, what doesn't work is the people who don't want to play in the process. In Port Hope's case that was council. More interaction on the council level was preferred instead of just having a body of individuals interested in the issue and then the council ignoring it for the rest of the time. Having a council member attend CLG meetings was suggested as a way of improving communication. It was also thought that if a referendum was held, it could help since

the CLG makes recommendations to the community. Up to this point it is the council who is making recommendations (Port Hope, A).

At one point, the CLG was notified that funding for their office would end shortly and that they would have to move fairly quickly. The closing of the CLG office not only made it difficult for the CLG to reach the community but it also invoked a loss of credibility and it made the CLG feel exploited and used (Port Hope, a6). The CLG chairman spoke with the STF Chairman about the office closing as there was considerable concern that without the support and network of an office setting, more time would be needed to obtain community input and to maintain a public presence (Port Hope, w).

One CLG member commented that after a hiatus between phase three and four, it was very difficult to go back out to the public. He stated that if the office shuts down again, so will the process and community exposure would disappear (Port Hope, w). CLG members commented on the lack of continuity of reports due to the office move, summer vacations and the lack of a central office drop off place. Reviewing documents became difficult as the previous documents were not readily available for referral (Port Hope, a9).

In late August, 1994, the CLG expressed some concerns about the process and the STF. The feeling expressed most often by members of the Port Hope CLG was one of disillusionment with the process and the people driving it. The members were unanimous in their feeling of abandonment. For example, many hours were spent working on a Remedial Action Plan in order to meet the time frame set out by the STF Secretariat. This report was then touted by the Mayor of Port Hope as the realization of her work as a result of her discussions with members of parliament (Port Hope, a10). In addition a great deal of time and effort was put into the technical working reports. This work seemed to be negated by the lack of consultation, discussion or review time that was given once they were published. The members of the Port Hope CLG were willing to continue to devote their time to the continuation of the process, but they needed to know that their work was respected, appreciated and worthwhile.

Towards the end of the process, the time frame was becoming more expert driven. At times the CLG felt that it was being pushed aside. It was suggested that this could be a fatal mistake as in the end when it comes to the referendum, people might be in a mistrusting mode.

The STF and the STFS were very surprised that the CLG felt that the process had become "top driven" and task orientated (Port Hope, C). It was felt that two of the main principles of the Co-operative Siting Process had been violated: that the community is a partner in the process and that there would be a choice of options (site, technology, mitigation) (Port Hope, A).

When Cameco came on the scene and the STF began to negotiate with them, the CLG felt overlooked. The claim was that it was not what was said but, what was not said that was the problem (Port Hope, C). The CLG was also upset that Cameco had been allotted space by the STF Secretariat for an open house held March 31 and April 1, 1995 without the consultation of the CLG. The CLG objected, noting that Cameco would be a tendered contractor. Bidding on the project and having them at the Open House was considered to be a conflict of interest. The CLG was also concerned that the presence of Cameco gave a perception of the STF and the CLG endorsement (Port Hope, a10).

There were also fears that Cameco's participation might give the perception that the CLG was biased towards caverns (since this is Cameco's interest). Meanwhile the CLG was trying to remain neutral on technology options. The CLG also objected that the questionnaire used at the previously mentioned open house was changed dramatically from the one previously agreed upon. This incident was described as an example of poor communication and a top down approach of opting for cooperation (Port Hope, C).

There was a complaint that the proposal put forth by the STF although sufficient for a source community, was inadequate for a host community. Too much work had to be done. Therefore, the STF Secretariat had to accelerate the pace of the process in order to meet the prescribed deadlines. To improve efficiency, the STF began communicating directly with the public instead of going through the CLG.

One CLG member shared his feelings that the STF Secretariat was looking at this project from a survival attitude. At the time, Deep River was their only option of survival, and success so naturally they were spending all their resources trying to sell Deep River on the project (Port Hope, w).

The STF questioned the CLG's complaint that the STF had not provided timely information on key community concerns, and failed to recognize the CLG's needs. The STF responded that they had consistently endeavoured to respond in a meaningful way to the concerns and questions brought forward by the CLG. Such responses included producing position papers and statements and conducting studies at the request of the CLG to obtain information or analyze issues.

A public information person hired for Port Hope believed that CLG members were sometimes forgetting that their task was always to represent the people instead of giving their own personal opinions (Port Hope, E). This became difficult because the process went on for so long and the CLG made such a large investment in it.

Recommendations

A local businessman felt that the approach used to promote a LLRW facility was wrong. He recommended a door to door campaign as only people from the two extremes of the issue became involved (Port Hope, F). He felt that open houses did not reach those people in the middle and since the process had gone on for six years, it was unlikely that this would change (Port Hope, F).

There was ambiguity over the CLG's role in the final hour. The CLG members wondered if they were suppose to continue gathering information or else give their opinions in the eleventh hour (Port Hope, A). There was also confusion as to whether it was the CLG's job to sell a referendum (Port Hope, A).

Another problem encountered was that for anyone who had been in the process for any length of time, there was a desire to solve the problem so that there would not be a feeling of having wasted time. Through the process it became difficult not to come up with a set of solutions to solve the problem. In addition, some members wondered if they should be presenting more than one solution to the community (Port Hope, A).

One CLG member commented that if a community gives the go ahead to get involved in such a

process, the community and council must also be willing to empower the citizen group that it chooses. This is not what happened in Port Hope. The CLG spent the entire three years working outside of council. It was thought that there should be some kind of official mechanism for bringing these two together (Port Hope, A). It was considered almost natural in Audrey Armour's (the originator of the process) scheme of things that to some degree that the individuals that would become involved would have a good rapport with the community and community leaders which includes council (Port Hope, A).

The public involvement representative for the community was not sure of the process. She explained that after people have been at it for so long, that they take ownership over it and rightly so because they have put a lot of effort into it. Things then become less and less clear. Another concern she had was that it was a very cumbersome process. Everything that one did needed to be reviewed and approved by so many people, that in the end it often did not get out. Nonetheless, she believed in the process and figured that one must work with the process's cumbersomeness as it is the best process presently available (Port Hope, E).

The process is difficult to have open to the public as the public does not understand its complexity. Therefore, the public will turn it off, then something will evolve and the public will say that they did not know anything about it yet, the opportunity to have input was there all along (Port Hope, G).

A common complaint was the excessive time frame of the process (Port Hope, A). The process needs to take less time. It was ludicrous that it took six years. Things appeared to have been inefficiently handled. There was no urgency and much of what occurred was thought to be an enormous waste of money. One councilman felt that the process was opened up too wide and that there should have been some logical parameters such as restricting distances for instance (Port Hope, G). There also should be definite time limits, less paper and less duplication of effort (ie. technical work). One CLG member and long time Port Hope resident felt that they were doing things in the most expensive, least effective way (Port Hope, G).

On a more positive note, many viewed the process as an an opportunity to enable the people of Port Hope to solve their own problems. Overall, it was judged a good process and all concerned were positive about having the opportunity to participate (Port Hope, B).

Appendix G

Deep River Profile

Motives for Involvement

In 1976, the government of the day brought 100,000 cubic meters of the Port Hope material up to Chalk River. This represents approximately ten per cent of the volume of the Port Hope area wastes needing management (Deep River, J). Historically, Deep River has been the only area in Canada that can appropriately handle low-level radioactive wastes. Deep River has more than forty years experience storing solid LLRW such as gloves, paper, cardboard, and bits of glass (Deep River, c). Many locals feel that the area's long association with the nuclear industry and its expertise make it a likely choice for a LLRW management facility (Deep River, e, C, J). In fact, Deep River's mayor up until November 1994, indicated that he believed that Deep River had a responsibility to the broader community to handle this waste and that this project is crucial to the town's ongoing viability (Deep River, J).

The chairman of the now resigned CLG stated that he became involved because it seemed like an important community issue (Deep River, G). At the beginning, the CLG went in with altruistic motives. There was a desire to share skills and expertise and a lot of goodwill (Deep River, B). Chalk River had also been interested in bidding with Deep River to host a site but, they did not have a suitable site (large enough) within its boundaries and therefore had to withdraw from the process. Ironically, the site under consideration in Deep River is located on AECL land which is located closer to the town of Chalk River than it is to Deep River.

There was concern expressed by the public that the only reason that Deep River was participating in the process was for financial gain. Although, the CLG acknowledged the available community compensation package component to phase four, they assured members of the public that the motivating factor keeping Deep River in the process was simply that there was a genuine desire to assist the source communities in dealing with their wastes, acknowledging that AECL had significant expertise to offer (Deep River, d). A few people mentioned that they liked the idea of being part of the solution to a problem (Deep River, B). One resident commented: "I love it ..it will give me a job. It's better here where it can be properly monitored" (Deep River, a12).

Others commented that "just because we are in the nuclear industry, it doesn't mean that we should accept it", "it's too close to the Ottawa River", "I live downstream and I don't want it", "we should not be used as an experiment by the government", "fear if they take some waste, we will end up with that of the entire country" and "I doubt that the process will ever come to consensus - it is a bureaucratic nightmare" (Deep River, a8). A Deep River councillor reported that he felt that the LLRW siting process was a public relations ploy and a waste of money (Deep River, a13).

Opinion was divided into two camps in the community. It appeared that many residents had made their minds made up early on. For the most part there were two types of community sentiments; the local valley people together with a large number of the National Forestry Institute (just recently disbanded) people who opposed the project and the technical people who felt that it was just a waste of money (Deep River, C). A number of people indicated that they would be comfortable having a low-level radioactive waste facility in the area but the costs and risks incurred in transporting 880,000 cubic metres of material were hard to justify (Deep River, f).

Those in favour, saw the proposal in terms of jobs (Deep River, C). Overall, the absence of high political resistance to a facility helped move the project along (Deep River, G).

Continued involvement in the process may have been linked to the announcement that Deep River would be losing federal funding for the National Forestry Institute and that AECL would continue to lay off people (Deep River, G). In addition, some major AECL funding was due to end in 1997. A LLRW facility may be seen as an economic salvation. If co-disposal also became part of a deal, that would take care of a longstanding major problem (Deep River, I). The mayor stated that co-disposal of the wastes now located on AECL property and the goal of minimizing the total volume of wastes, should impact positively on the local perception of this waste project (Deep River, a21). Co-disposal offers a number of significant advantages to the government, AECL and the Deep River community since, two waste disposal problems are solved at once and there is also the potential for a cost savings. AECL's infrastructure and expertise would be used effectively and the consolidation of various LLRW in a single facility is good waste management and radiation protection practice. Not only would the Deep River location solve two longstanding historic waste problems, but, there would also be industrial-type benefits (job creation, local purchasing, taxes or payments in lieu) and equity compensation (Deep River, a22). Moreover, some feel that they will get stuck with it anyway so it would be better to volunteer under this cooperative siting process.

Involvement Patterns

Initially, there seemed to be a fair degree of indifference about the project. In fact, an open call at the beginning of phase four for CLG members resulted in ten people applying for ten positions. Greater interest was shown when membership was expanded to include Chalk River and the United Townships.

The previous mayor stated that meetings were not well attended and that it was basically the same people time after time and that they tended to ask the same questions over and over again (Deep River, J). He commented that they just never gave up, or else they did not like the answers that they were given and therefore, they would ask again (Deep River, J). One resident explained his lack of attendance by stating that he trusted the CLG to "do what is right".

Sometime in December 1993, the STF agreed to let the CLG hire a professional communications firm to assist in the implementation of a public involvement workplan since, the CLG was having difficulty implementing a workplan (Deep River, a7).

In the summer of 1994, the CLG quit. One of the major reasons they gave for their resignation was that they were frustrated that certain information was unavailable and the extended timeframe it took to get answers (Deep River, a10, F). One resident wrote that the long delays waiting for reports such as the "Do Nothing" report and a Health Study were frustrating, disillusioning and eroding the community's trust in the STF and the STF Secretariat (Deep River, a10). After several months, the STF finally produced a document on health studies. It showed which areas of the province have cancer rates and birth defects above and below the provincial average (Deep River, j). It was not that useful because it was unable to provide a good comparison as the people in Deep River are healthier, younger and more educated to begin with (Deep River, G, H).

After the community liaison group resigned, the STF lost touch with the community and little was done to get the visibility of the project up (Deep River, C, G). The CLG was not replaced and

it seemed like the whole issue had died (Deep River, G). The STF tried to maintain a local presence by keeping the former CLG liaison group office staffed by STF secretariat personnel for twelve hours a week. However, community contact with the office after the CLG resignation was minimal (Deep River, D). In May 1995, the STF did an open house in Deep River with just over a hundred people attending. They also hired a staff person who is a Deep River resident and editor of the local Newspaper to manage the office (Deep River, G). The siting task force maintained that it was important to continue a local, ongoing, operational presence in Deep River (Deep River, D).

Environmental Suitability

Many questioned the physical suitability of the area and asked why the government was considering transporting the wastes to an area with thin permeable soils that are unsuitable for use as a landfill site? Furthermore, the area is located on one of the major seismic zones in Canada. The risk here of a Richter scale 7.5 earthquake is one in 500 years (high risk) (Deep River, i). An expert on seismicity from the Geological Survey of Canada explained that seismicity in this area would not preclude building a facility, however, there would be some restrictions on the type of facility that could be built. Seismicity was not used in the comparison criteria because it was determined that there was no basis to compare one site to another as they all fell within the same seismic zone (Deep River, j). This was in contradiction to the requirements set out during phase three. A STF publication titled "site elimination criteria" stated that "geologically unstable lands subject to earthquakes and faulting, and lands prone to flooding were to be eliminated as potential sites" (Deep River, k). This would have excluded the AECL property inside Deep River's boundaries from being a potential site. After these concerns were voiced, a new version of the "site elimination criteria" was introduced. The new definition only excluded "lands subject to significant seismic activity with the potential to adversely affect the performance of the waste management facility" (Deep River, l). Furthermore, AECB decided that no area of Ontario is likely to warrant exclusion from consideration as a potential site for the storage of the Port Hope area wastes on the sole basis of seismicity.

The siting task force assured Deep River residents that the underground mined cavern and the open pit with pervious surround facilities are "in ground" structures or excavations capable of receiving ground motions from regional earthquakes without any loss of their ability to effectively contain and isolate the wastes (Deep River, o).

The site originally chosen (called E1), is located on government owned AECL property (Deep River, B). AECL had serious reservations about the STF's chosen site for two reasons. There was a land use conflict with AECL's long term business plans which was not brought forward until the later stages. Secondly, AECL believed that the groundwater flow through the rock and overburden follows the topographic slope and that flow lines from E1 pass directly beneath the Chalk River Laboratory complex and discharge into the Ottawa River. This situation could have severely hindered and possibly compromised future evaluations and monitoring of the groundwater discharge pathways from the E1 site (Deep River, a2).

The STF tried to reassure the nearby communities that the Ottawa River would quickly dilute any contaminant from the facility and water quality at Petawawa and Pembroke would not in any way be compromised by the facility (Deep River, a3). Obviously the downstream communities were not completely confident especially since AECL believed that the site evaluation work that was being carried out by the STF was insufficient because it lacked a large scale groundwater

flow system model. They maintained that without such a model, that the technical basis for assessing the adequacy of any potential candidate disposal site at the Chalk River Laboratory would be incomplete. Therefore, they were unable to confirm the technical acceptability of any of the sites proposed by the STF (Deep River, a2).

The STF countered that they were postponing the development of a large scale groundwater flow model as the STF feels that it is technically unnecessary and financially irresponsible to expend large amounts of money on a detailed, multi-year, technical investigation prior to ascertaining whether or not Deep River will be the host (Deep River, a4).

It became increasingly apparent that selecting potential sites that were mutually agreed upon required the integration of AECL siting considerations with siting criteria established by the STF and the CLG (Deep River, a5). Within two weeks of AECL rejecting the chosen site, they suggested an alternate site. On September 27, 1994, all work was suspended in Deep River until a work plan was completed by AECL on a new site called N1. Site (N1) was selected to avoid intersecting major faults that may have acted as pathways for movement of ground water.

AECL also decided at this late date that only their own technical people were capable of approving the site (Deep River, a5, a2). In addition, if a facility was established on AECL's Chalk River property, AECL would want to have managerial and operational responsibility for such a facility (Deep River, a2).

This alternate site however, was not the one that the CLG had endorsed. The new site chosen is located around Bombers Bay where some cottages are located. Initially, the people were suppose to select the site and the technology. This change served to undermine trust (Deep River, F).

Risk Perception

One CLG member described the siting process as a risk perception issue for the potentially affected communities. She felt that there was an unreal conception of what this waste is.

In a memorandum to Dr. Vera Lafferty (the secretary general of the STF secretariat) from John Hubicki (a STF member) concerning a CLG meeting on August 3, 1994, it was noted that the "audience was strongly anti-waste site and their fears will unlikely change as they are beyond rationalization ...can you guarantee the safety for the next 10,000 years ...how can we trust the politicians ...if its safe why move it...there are no advantages to Chalk River" (Deep River, j).

Hubicki added that a lack of a proponent undermines understanding and weakens credibility (Deep River, a17). For example, going through the process without a proponent means that compensation cannot truly be finalized. In addition, the absence of local political officials at the meetings was undermining the confidence of the public.

Hubicki also pointed out that the minister of Energy, Mines and Resources refusal to guarantee the STF recommendations undermines the process. He stated that all were aware that we are working in a political environment and there needs to be some predictability of outcomes. Hubicki commented that the CLGs seem to have a lot of respect in the community (Deep River, a17).

The previous mayor commented that the NIMBY syndrome was very strong. He indicated that no matter what was done that they were not going to come out looking too good. Nobody is

going to cheer (Deep River, J).

In Deep River, many people are not afraid of the waste; they see most of it as garden variety dirt (Deep River, I). Many questioned why money would be wasted on the waste aside from a few small pockets of the material (Deep River, B,I). A CLG member reported that many people from Deep River and surrounding communities are against it because of the transportation issue. There are also concerns about any potential run off to downstream communities (Deep River, I).

One citizen felt that the only way to convince people is to show that more can be obtained than just disposing of waste. He recommended presenting the risks in proper perspective and in a form that is readily understandable. He felt that the STF should have been of more assistance in communicating risk. Also the risk of doing nothing should have been highlighted more (Deep River, m).

Health and Safety

Many in the area opposed the LLRW Management Facility because of health and safety issues (Deep River, h). Frequently, at public information meetings concerns were voiced concerning health risks due to radiation (Deep River, h). A large proportion of public perceive uranium mill waste as being dangerous. They fear arsenic and radium leakage in drinking water because the soil is mostly sand, the water table is high and the risk of fluidization is also high (Deep River, h).

Transportation

Deep River is located 150 kilometres northwest of Ottawa on the Ottawa River northern route of the Trans Canada Highway. Rail facilities run southwest of the town's centre. Many consider moving the waste from Port Hope to Deep River to be an obscene waste of money (Deep River, m, G). The economic costs of moving the wastes from Port Hope are in the order of \$100 million (Deep River, n).

During the November, 1994 municipal elections several of the communities surrounding Deep River had a question on the ballot asking if they were "in favour of transporting nuclear waste through the county of Renfrew and having it stored on AECL property?" (Deep River, J). Eighty per cent of the voters were not in favour and the vote broke down in the following manner: eighty-seven percent against in Pembroke, eighty-four percent against in Petawawa and Townships and eighty percentage against in Chalk River and the Townships (Deep River, H). Deep River did not ask the transportation question on the ballot (Deep River, H, J).

Deep River residents voiced concern over the conventional hazards and potential fatalities of increased truck traffic (Deep River, g). Their concern was not so related to the material, rather, it was just the fact of there being so many vehicles on the roads (Deep River, h).

Tourism

Deep River's close vicinity to Algonquin Park and a great number of outdoor activities make it a significant tourist centre. There are 75 recreation or community clubs in Deep River (Deep River, a). Furthermore, tourism and recreation are viewed as potential growth industries for the area. There was local concern expressed that if a LLRW facility was built that tourists would perceive the area as a radioactive dump (Deep River, h).

Property Values

Some Deep River residents are concerned that the market value of their homes will plummet and that the drinking water will be contaminated (Deep River, q). One CLG member felt that when the waste is trucked out of Port Hope and Clarington, that their property values will skyrocket and the values in Deep River will probably drop (Deep River, H).

Trust in Government

Government mistrust existed in this siting exercise from the beginning (Deep River, I). For some a lack of trust in the process was compounded by people wanting to hit back at government (Deep River, m). It was suspected that some of the opposition could be a revolt against the uncontrolled spending by federal governments, Liberal and Conservative, to buy popularity with the taxpayers' own money (Deep River, g).

Ottawa assured the CLG that they would be reducing the quantity of the waste by 30 %, but that figure was boosted 30% half a year ago (Deep River, H). This was seen as being misleading.

The person in charge of the siting task force secretariat stated that Deep River had been in phase four for three years and in the process for seven and it was sobering to appear to be back at square one - searching for trust, questioning each other's motivations and hidden agendas, not feeling part of the team, frustrated and fed-up. She feared the future and the lack of time left to set things straight (Deep River, a11).

After council and the STF had jointly appointed the CLG, there was little contact between them. Some CLG members felt that this diminished the credibility of what the CLG was doing (Deep River, E, G, H). The previous mayor commented that maybe town council should have taken a more active role especially when the CLG was going through a difficult time (Deep River, J).

Many question: "if the waste is so low level why is it being moved?" One CLG member with a great deal of experience with radiation described the program as a government whitewash.

In the brochures Opting and Options put out by the STF, the waste is referred to as low level because it gives off only a small amount of radiation, slightly more than background levels. In the data that the CLG received in the third phase, it was indicated that the radiation from the waste was hundreds to several thousands times that of background. The level of the arsenic coming from the leachate of the largest historic site was 300 X the acceptable level for drinking water. The STF literature indicating that the levels were only slightly more than background levels made the community feel misled and it undermined trust (Deep River, I).

During phase three, John Maddigan of the STF stated that if one municipality in a coalition of municipalities opted out, the entire coalition would be excluded from the process. This turned out to be untrue and the Secretary General of the STF Secretariat, Dr. Vera Lafferty, responded that John Maddigan was only a staff member of the STF and that he had been mistaken. Dr. Lafferty also stated that the reason for the change in definition of community was because the original definition applied only to phase three. However, the Deep River community was unaware of any new rules being introduced for subsequent phases. Obviously, these changes damaged the credibility of the Siting Task Force (Deep River, p).

The definition of community was also changed on another level. Originally three types of communities were identified: volunteer communities, access route communities and source communities. A volunteer community was described as "the municipality that volunteers to host the new facility. The area that immediately surrounds the new facility may be entirely in one municipality, or it may be part of more than one if the location crosses municipal boundaries. In this case, all municipalities included in the location would be considered as the community. The area surrounding the proposed AECL site belongs to Chalk River and the townships. Recently a new definition of community evolved. The potential volunteer community is one that chooses to opt into the Process and be considered as a potential site for the facility ...the municipal boundaries will define the geographic limits of the potential volunteer community. All other communities are potentially affected communities (Deep River, a18). Having the word "community" interpreted and reinterpreted as the process went along lead to tremendous problems and greatly affected the credibility of process (Deep River, F).

This issue becomes even more complicated when one considers that the AECL land in question for a site does not even touch the town of Deep River rather, it is situated nearer to Chalk River - in fact, it borders it.

Another serious rule change was that referendums would no longer be binding according to the STF. This pronouncement was in opposition with the earlier publications put out by the STF. One CLG member pointed out that at the first meeting that they had been told that if the community voted no there was no way you would go to next level (Deep River, I). The CLG wanted the referendum to be binding; they felt why bother voting if it is not. Changing the rules of game was seen to undermine community input into the final decision and brought into question the entire process of public involvement and decision making. Overall, trust was weakened when rules changed as the CLG did not know where they stood (Deep River, B).

In October, 1994 the entire CLG (appointed by council) quit because they were dissatisfied with the way the process was going. Council continued on without representation from a CLG. Up to this point, council members had rarely attended meetings and were unaware of what was going on. Chalk River's council was against project.

Meetings with the task force were open to the public but they were often in obscure places and eight hour meeting minutes would be summarized as only one page and they were described as very brief and watered down. A former CLG member felt that controversial information was left out (Deep River, A).

After the resignation of the CLG, government personnel arrived at the CLG chairman's home requesting that he return all the documentation he had accumulated during the process. The chairman did not release the information as requested as he was still deciding what to do. Several hours later two RCMP officers arrived at the chairman's home and took the documents saying that these documents belonged to the Federal Government. This caused the chairman to question the openness of the process (Deep River, G).

After the CLG resigned, town council took over negotiations with the STF. The STF sponsored several council members to accompany them on a trip to Europe to observe some LLRW facilities. One former CLG member commented that some Deep River residents resented council members getting a free trip to Europe and an opportunity to advance their careers at AECL (Deep

River, l).

Potentially Affected Communities

Access communities have real concerns regarding the disruptive transportation situation stemming from their experience with the trucking of Port Hope wastes to the Chalk River Laboratories in the 1970's. Residents perceive radioactive waste in the county as a health risk and as a stigma (Deep River, f).

A member of concerned citizens for Renfrew County expressed concern which was shared by members of the public about the definition of the word - community. They were concerned that they would not be adequately addressed because they did "not have a vote" either on the CLG or in the referendum at the end of phase four. The CLG chair acknowledged that there was possibly a fundamental flaw in the process, in that there was no provision to have residents outside of the host community actually participate as an equal member of the CLG. It was also noted that there were residents of Chalk River and Rolph, Buchanan, Wylie and McKay whose properties were closer to the potential site than most Deep River properties (Deep River, s).

There were concerns that the project could negatively affect the relationship between Deep River and those down river since they would be more affected than the town of Deep River (Deep River, t). For some there was a sense that any advantages were not worth destroying relations with neighbouring communities (Deep River, m).

Due to the fact that southerly communities have the potential to be more affected by the project than Deep River, a Study Group on the Potential Downstream Effects was formed. Their mandate was to review, comment upon and make suggestions on all Deep River work plan activities having potential impacts on the water supply downstream of the AECL property. They were to assist the CLG and the STF in identifying community concerns about potential downstream effects, and in determining whether these concerns are addressed in the proposed studies. They were also to assist the CLG in reporting to the downstream communities about how their concerns were addressed, and what the results of the studies indicated.

A resolution was passed requesting that Deep River Council communicate with the Councils of the Village of Chalk River and the Townships of Rolph, Buchanan, Wylie and McKay, to discuss and resolve the issue of participation and representation on the CLG (Deep River, r). In July of 1993 four new CLG members from surrounding communities were added to the expanded Deep River CLG.

A new council elected in November 1994 decided to disallow the previous council's extension of the referendum's boundaries to include Chalk River and the Townships.

Mayor Murphy replied that there was no mandate for a second vote on the issue (Deep River, u). The main reason the council made the change had to do with a low-level radioactive waste question placed on the election ballot in Chalk River and the townships last November. Voters gave a resounding thumbs down to transporting and storing low-level nuclear waste in the Deep River area. The people of Deep River did not have a plebiscite along with the municipal elections as the mayor was in favour of allowing the STF process continue. Furthermore, a mayoral candidate who ran on a platform of directing the STF to leave town ran a distant third (Deep River, v).

The new Deep River mayor, John Murphy claimed that it would be difficult for those who rejected the process to have a formal presence in the siting process. The Deep River council resolution came as a surprise to both Rolph, Buchanan, Wylie & McKay Reeve Paul Curtis and Chalk River Reeve Tom Tennant. One reeve stated that "all of us involved in the process sat in a meeting at the beginning of our terms and Mayor Murphy stressed the importance of working together". A joint news release from the two reeves stated that: "It is a sad day in our municipalities when co-operation and consultation are completely passed by. Our first news of this disastrous decision came about on the street and not from any member of Deep River council" (Deep River, u).

The two reeves commented that this situation put a cloud on the typical neighbourly attitude. Town council had excluded voters in Chalk River and Rolph, Buchanan, Wylie and McKay Township from an upcoming referendum on the proposed low-level radioactive waste site. "From a political perspective, it was very disturbing that there was no communication between the municipal councils prior to making their resolutions" Reeve Tennant of Chalk River said (Deep River, u).

Ken Pleadwell, deputy reeve of Petawawa Village mentioned concerns related to not being able to participate in decision-making, although his area is more affected by downstream, downwind and transportation effects. One forestry employee commented that the definition of community could no longer be confined to administrative boundaries, Deep River can't be trusted to keep everyone's best interests in mind and protect them. It has been said there will be compensation to balance risk; then there must be compensation for those at most risk, downstream and downwind. The transparency of the Process has become an issue; with the CLG gone, who will, on behalf of the citizens, watch what is being done? The process needs a link to the public (Deep River, x).

In the end the cost to Deep River was tremendous as they became blacklisted by some people in the surrounding communities (Deep River, F,G.). For example, the baseball league that used to play in Deep River and Chalk River no longer play ball. When the other townships were denied a vote on referendum, they instructed Deep River to work alone on an area economic development project originally to be funded by four municipalities. They also withdrew funding of \$50,000 intended for a long term care centre (Deep River, G).

Impact Management

Paul Rennie of the Siting Task Force said that the allegation of compensation being considered as a bribe is something they have been concerned about. He stated that the incentives can't be considered a bribe because they are being offered openly with all communities having the opportunity to receive them (Deep River, a19). The local paper points out that it is well recognized that this facility carries a stigma and the community that volunteers for the site is solving a problem and therefore, and it is only reasonable that the community be compensated by society for doing that (Deep River, a20).

Compensation appeared to have a pivotal role in the process (Deep River, E, F, G). Others felt that the economic benefits would be minimal longterm and out of proportion for the inconvenience and the cost of moving the waste (Deep River, i, E). Still others thought that compensation was joke. They were told by the STF to make up a wish list. People had no idea of what compensation would end up being (Deep River, D).

The CLG wished to play a major role in the compensation issue (Deep River, G). Potentially affected communities also requested to be involved as they had been instructed that affected communities would be eligible for compensation.

In the end, the CLG had a minor role in the compensation negotiations. This was of course accentuated when the CLG members quit the process and were cut out of compensation negotiations (Deep River, C, G). Council managed these negotiations on their own. Some interpreted the closed door sessions between council and the STF as a display of paranoia (Deep River, G).

A further complication in the compensation issue was that the STF did not have the authority to make any guarantees. The cabinet of the federal government has to approve both the project, the location and the funding (Deep River, G).

At one point AECL indicated that they would only be prepared to host a facility for the management of Port Hope area wastes on its Chalk River Laboratories property if the facility were developed and licensed as a disposal facility (Deep River, a2).

AECL's cooperation and participation is needed to examine codisposal in a meaningful way. A letter from AECL dated October 17, 1994 confirmed that AECL was interested in co-disposal as a means of disposing of LLRW that is currently stored on their land and is produced by their ongoing operations. According to Colin Allen, Vice-President of Physical and Environmental Studies at AECL, AECL's objectives in co-disposal would be to minimize costs, to the extent possible, to AECL (and hence, the Canadian taxpayer) for disposing of wastes arising from AECL's operations and to continue to operate the CRL site in a manner that protects public health and employee's health, and minimizes any environmental impacts (Deep River, a2). AECL and the STF are required to jointly develop a work plan and schedule and together present it to council (Deep River, a6).

Ethics

Many Deep River residents are offended by the prospect of wasting tax dollars by unnecessarily transporting wastes hundreds of kilometres. The hope is that the wastes can be disposed of safely and economically at Port Hope (Deep River, g).

Some of the comments coming from visitors to the CLG office included: "it is not an environmental priority - money should be spent on other problems", "why doesn't Port Hope keep it, they got the employment and tax revenue - why risk moving it at all? If a technology can work here why not use it there", - "stupid to pay the costs of moving it", "felt moving the waste was a political issue and therefore a waste of money" (Deep River, a17).

Some residents expressed an unwillingness to accept any risk no matter how small that could affect future generations (Deep River, m).

The public expressed concern that the CLG was dominated by AECL employees. This was seen by some members of the public as a conflict of interest. The chair noted that the only applications received for membership on the CLG were from the 10 CLG members who applied from the previous phase (Deep River, y).

Deep River continued in the process despite the feelings of its neighbours. This ignored the fact that the proposed site is much closer to many of the Chalk River residents and townships than it is to Deep River. Deep River lies upstream and upwind of the proposed site and railway cars or trucks carrying radioactive waste will have no need to enter Deep River residential areas because AECL is on crown land that just happens to be within the municipal boundaries of Deep River. The citizens most affected are left out of compensation which is unethical.

Petition. /Referendum

In phase three the CLG recommended that the community not proceed to phase four. This was in part based upon a poll that found sixty-nine per cent as being against hosting a LLRW facility and an overwhelmingly negative response of those people attending meetings. However, it was also acknowledged that the "poll" which was taken was very informal, did not involve enumeration of participants and was not binding. There was a response rate of 20% (unweighed) (Deep River, n). Voting forms were distributed to households via Canada Post as flyers; box holders probably got them but not necessarily general delivery. Even if a collector read the CLG flyer, other members of the household may have known nothing of it. Also there was no indication of how to indicate if there was more than one voter in the household (Deep River, y).

The referendum was held on September 21, 1995. On recommendation by the STF, only the actual host community who would be "giving up" land for all eternity, voted in the referendum. This meant that the vote was limited to the town of Deep River (Deep River, r). Council's decision to disallow other communities to vote, alienated these areas (Deep River G). When the CLG was in place, Chalk River and the townships were also slated to vote (Deep River, G). A member of the general public of Deep River expressed that he wished that the council would waive exclusive jurisdiction (Deep River, r). The results of the vote were overwhelmingly in favour of hosting a LLRW management facility with approximately seventy per cent in favour of continuing.

Siting Process Concerns

In beginning everything was going along very well (Deep River, G). One CLG member described the CLG in the beginning as very optimistic and idealistic (Deep River, I). When Audrey Armour, the originator of the process left, some felt that progress was not as smooth. The new management changed the tone of the process and a common complaint was that it became difficult to get answers quickly or at all (Deep River, G).

The CLG felt ignored by the STF secretariat and questioned how the head of the secretariat could have a feel for the community when she visited Deep River so infrequently (Deep River, G). One CLG member complained that those coming from the STF were intimidating and that the cooperative process was a front - felt steamrolled over (River, I).

Findings based upon 48 interviews selected amongst a broad group of people revealed that most respondents did not have a clear understanding of the duration and objective of phase four (Deep River, a1). Many also did not have a clear understanding of how AECL fits into the project and the siting process. Respondents asked for concise, understandable information about these issues, in summary form in layman's language (Deep River, a1).

A minority appeared to have lost confidence in the community's ability to have input into the decision-making process. Some of those respondents stated that their loss of confidence stemmed from the outcome of the phase three poll (Deep River, a1).

Deep River's previous mayor who also works for AECL was appalled that the issue of the public choosing the technology came up (Deep River, J). In contrast, the CLG felt that because this was a public process that the citizens of Deep River should be involved in the technology selection (Deep River, a9). However, CLG members lost faith in the credibility of STF partly because the technical reports consumed so much time and energy and in the end they seemed redundant. Meanwhile there was a need for more funding and time for public input (Deep River, a9).

One CLG member noted that there was a lot of money allotted for the technical side which was the easy part of the siting. She recommended that more money should be designated for the "soft" side of things so that social science skills would be more fully developed (Deep River, B). It was felt that there was a need for someone who can speak to the community without coming across as pompous or arrogant to devote considerable time to informing the community earlier on in the process (Deep River, F).

A large proportion of the Deep River community is very scientifically aware and technically astute. There appears to be a growing sense in the community that the environmental problem in the source communities is not technically serious but rather, a political issue (Deep River, a12). It was felt that the government should be more upfront. Deep River is a very international community with an unusual grasp of the scientific world compared to other small towns (Deep River, B). A CLG member added his opinion that the real issue may not be a scientific one but rather more of a social, psychological and political issue (Deep River, a12). In particular, those people with technical backgrounds claim that trucking LLRW is a waste of taxpayer's money (Deep River, C). As a result, some members of the community are increasingly questioning the feasibility of moving the wastes anywhere given the economic realities of the times (Deep River, a12). At a CLG meeting, the STF explained that although the waste problem may not be seen as a serious problem by Deep River citizens, it is seen as a big problem in the source communities. Another STF member reminded all present that, AECB's decommissioning order on the Port Granby site indicated that in this location there was definitely a real problem that must be dealt with. This site is a high priority as Port Granby is adjacent to Lake Ontario.

Deep River Council had many concerns such as the lack of proponent of the facility and the danger of allowing the process to become an end in itself. They also expressed concern whether AECL would want the role of proponent and the cost-effectiveness of co-disposal and therefore, requested that the STF immediately begin a study of Co-disposal as a component of the suitability of Deep River as a host community and report by Jan 31, 1995 (Deep River, a14).

There were also concerns about the costs of the process and the facility and fears that the government might not remain committed to the project. Deep River was very worried about the deteriorating relationship with Deep River's neighbours, particularly given the timing of the next municipal election (Deep River, a15).

After the CLG's resignation, an exit interview with a CLG member, revealed that the main reason for the resignation was that the CLG members felt like puppets in the process. They also felt that they had been ineffectual (Deep River, A).

Some complained that reports from the STF were too slow in coming and information was held up while the STF did refinements (Deep River A, B, H). Meanwhile the CLG took the heat. The CLG never did see the health effects study as it came too late. The CLG claimed that in May

they had been promised that it would be there next week and it had not arrived by the time that the CLG resigned in October. This created distrust because some CLG members surmised that it took six months to write the report because the STF may not of been happy about what it said, and therefore may have rewritten it (Deep River, G). Moreover, the CLG felt that they had lost their credibility because they had been unable to get the answers to their community's questions. The CLG was discouraged because they had unsuccessfully tried to get community involved but, the government's hard to understand run around or technical answers had turned people off (Deep River, E, F). For example, in response to a request for a particular dilution study, the CLG was informed that it would be done later after Deep River had voted to continue. They felt that they were being asked to make a decision in blind faith (Deep River, G). The general consensus was that they could not function as communicators as the needed answers to questions just were not there (Deep River A).

The CLG chairman indicated that it appeared as though they had been communicating for over two years for naught and that council with one ultimatum had been far more effective. Moreover, he felt that the CLG was no longer certain, that they understood their role vis-a vis council and the STF and that events were taking place outside their control. Another extremely bothersome theme voiced was the STF's decision to not be bound by the referendum results. The CLG chairman pointed out that town Councillors had all agreed to respect the referendum results, but not the STF who were supposedly leading a process dedicated to public acceptance (Deep River, A).

It was stressed that the CLG members were all burned out; they simply couldn't get their level of energy and enthusiasm up after the summer (Deep River, A,B, F). They could see an impossible workload ahead to get to the community sufficiently informed to make an educated decision in the March referendum (Deep River, A).

Also compounding the time issue was the fact that the STF work had been suspended for a year while they waited to receive additional funding. Co-disposal offers a number of significant advantages to the government, AECL and the Deep River community since, two waste disposal problems are solved at once and there is also the potential for a cost savings. AECL's infrastructure and expertise would be used effectively and the consolidation of various LLRW in a single facility is good waste management and radiation protection practice. Not only would the Deep River location solve two longstanding historic waste problems, but, there would also be industrial-type benefits (job creation, local purchasing, taxes or payments in lieu) and equity compensation (Information Package from Open House on Site, Facility and Transportation Options for Deep River as a Potential Volunteer Community, May 5-6, 1995).

Recommendations

Regardless of which view people have, they generally admit that they like the process as it gives them a chance to air their views (Deep River, z).

One resident suggested that to increase acceptability that the government should give more guarantees on funding availability for unforeseen problems which would decrease risk (Deep River, m).

At the time of the vote the advantages and disadvantages were laid out in such a way that the disadvantages were very clear and the advantages were vague. During the period up to the vote,

the media coverage was mostly negative. This was not thought to be the media's fault. With little discussion of the advantages, there was scarce good news to report; only talk of costs and risks. At each meeting, it was a few critics who made the news. At one meeting which could have yielded a more positive message, the one on impact negotiation, it was protestors disrupting the meeting who grabbed the headlines. The last article in the North Renfrew Times had only negative references to the CLG and no reminder about upcoming meetings. With important meetings still to be held, there was a natural, and reasonable inclination to put off making one's mind until all the evidence was in. The week before the vote, neither the Town Office, the North Renfrew Times, nor the Bell Telephone directory was able to give a local resident the CLG's office number (Deep River, g).

A Deep River resident expressed concern about the "options" newsletter put out by the STF. It was felt that it was too difficult for the average person to understand and full of abbreviations and long technical names. It was recommended that the STF put increased emphasis on producing more readable material. Also, the booklet on site elimination criteria received similar criticisms (Deep River, a8).

Another important issue needing correction is the absence of any individual or group to champion the waste management facility. There were opponents but no proponents (Deep River, z.J). The town and township councils are supposed to maintain a quasi-neutral position, presumably because they were going to have to receive and judge the CLG's report. AECL decided against interfering in local affairs although it has much to lose through its LLRW Management Office as it has a mandate and responsibility for solving this process and ultimately, it is the STF which has responsibility for the process. The federal government is the one with the dollars so in the end it would end up being the proponent but they did not take this role in the process (Deep River, J). Therefore, the STF could use a champion for its cause (Deep River, z).

Another problem is that there were no elected officials involved with the CLG. This is needed for there to be a feedback loop. Elected officials have other agendas so without a direct connection it may be difficult to maintain interest.

Deep River's previous mayor who was involved in an official capacity with the project until November of 1994 felt that the biggest flaw in voluntary siting process related to the high degree of openness that required finding out what everyone thinks and having everyone tell those involved (Deep River, J).

There was an overall concern that the STF did not provide timely information on key community concerns, and failed to recognize the CLG's needs. The STF disagreed and replied that they consistently endeavoured to respond in a meaningful way to concerns and questions brought forward by the CLG by producing position papers, statements and conducting studies. Sometimes the STF had to give answers that the community did not want to hear ie. that the referendum would not change the fundamental ground rules.

It was felt that the STF failed to address the real issues in the community (Deep River, m). Some believed that the STF still, at this late date failed to recognize the CLG's needs in representing the community. The CLG was trying to explain the questions they were getting from the public and obtain help in providing answers, while the STF was countering that the questions were wrong. For example, when the chairman refused to recommend that the referendum be binding,

on the grounds that the Deep River Council is the proper decision making body, it was felt that the chairman was confusing recommendations with decision making: for a task force not to make a recommendation on a point that it considered important was thought to be an abdication of responsibility. One resident noted that if the process fails because the STF failed to appreciate what was needed and to provide it in time, good intentions will not have been good enough (Deep River, m).

Deep River appreciated the positives from AECL's position on co-disposal, the volume reduction study and Port Hope volunteering (Deep River, A). However, co-disposal negotiations bypassed community input which was not in keeping with the philosophy of the cooperative siting process (Deep River, C). However, the STF heeded the CLG's advice to delay the referendum to allow time to convince community that co-disposal means cleaning up Deep River waste (Deep River, A). As a result of council's vote in October to consider co-disposal, technical work was on hold until a study of the issue was completed. In the end the STF did elect to delay the vote and the STF mandate was extended from March 31 to September 30, 1995.

The CLG appeared to want all conditions nailed down in an agreement before a referendum would be held. Several primary concerns included benefits, compensation and property value protection. People also wanted to know what the potential health effects would be. Water quality monitoring and preferential hiring and purchasing were top priorities. The CLG wanted a resolution of components before drafting an agreement and holding a referendum. It was felt that the community had insufficient information and was dashing to the finish line (Deep River, F). The timeframe was unrealistic (Deep River, F).

A CLG member recommended that the government be more upfront concerning the percentage of costs allocated for compensation. She found that in stage three the community was led to believe that compensation would be very generous and then in phase four things became very miserly (Deep River, B).

After the CLG resigned, the STF turned to council for input. A compensation package was worked out behind closed doors with council. Both the public and the press were excluded from taking part and/or observing the proceedings. The community believed that the original intent of the process was to have compensation decided with community for feedback and input (Deep River, F, G). This seemed in direct conflict with the concept of a community driven open process (Deep River G). Only after council had developed a compensation package with the STF, did the public hear what it contained.

It was felt that both the confusion about the parcels of land available for a site and the lack of a clear proponent are indicative of a deeper problem which is that the Ministry of Natural Resources doesn't seem to have coordination amongst its agencies (Deep River, J).

Volunteer/source communities

Taken from Opting for Co-Operation: A Process in Action - The First Phases (in reference list)

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