

# **Risk and Decision Making in EIA: The Public Agenda**

**Jason Copas**

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## **Abstract**

***A case study of the EIA process involving the siting of a 110 ft microwave tower on Wolfe Island has helped to demonstrate that the separation of the EIA process into the mutually exclusive categories of risk assessment and risk management is artificial and destabilizing, and greatly out of step with the public's growing environmental consciousness. It is necessary to integrate the "softer" concerns of risk management and risk perception--psychological, social, political and ethical--with the harder scientific concerns of risk assessment. There are benefits to be gained from this integration including enhanced credibility for decision making institutions (government and corporate); and, a less confrontational (more satisfying) process. As well, this integration would help to provide a foundation for the full maturation of public environmental consciousness. Additionally, and perhaps most importantly, attention was drawn to the particular importance of uncertainty in risky environmental decision making.***

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## 1.0 INTRODUCTION

In the past 10 to 15 years, industrialized society has witnessed the emergence of an important policy question: How safe is safe enough? The discovery and publicity of new hazards is causing citizens to see themselves as victims rather than beneficiaries of technology, and is stimulating opposition to various technologies. This opposition continues to perplex and concern industrialists and regulators (Slovic et al; 1986). But if the experts are troubled, they should not be particularly surprised--public concerns and opposition are almost inevitable outcomes of the increasing number and complexity of the risky technologies being introduced into society on a regular basis.

But who is at risk? How much risk is involved? And who's estimation of risk is correct? All of these are essential questions in considering how matters of risky technologies should be dealt with. This study proposes to address these questions through the examination of the environmental assessment process surrounding the siting of a 110 ft microwave tower on Wolfe Island. However, before looking at the specific results of the case study, it is first necessary to review the concepts of risk, risk assessment, and risk management.

### 1.1 Risk, **Risk** Assessment, and Risk Management

Risk is at once an easy and a difficult concept to comprehend: easy in that it involves intuitive concepts such as hazard and danger; more difficult in that it involves less readily understood ideas of probability and uncertainty. In its essence,

however, risk is simply a negativity and the chance of its realization (Rescher, 1983).

Although the definition of risk would seem straight forward enough, the estimation of risk is often anything but. In many cases (including a number of areas of government activity) not enough is known about the physical and biological worlds to forward accurate estimates of “rare or unique” events (e.g. nuclear meltdown). Consequently, one may not have a great deal of confidence in such estimates (Page and Ferejohn, 1986).

This of course has important implications for the lay person and expert alike. If risk assessors are frequently operating on less than perfect information, the question arises as to what basis exists for them to make decisions that could affect people’s lives and health without the complicity and/or awareness of these people.

Given this state of affairs, the assessment and management of risk have become increasingly politicized, with the size, number, and sophistication of environmental and citizen groups continuing to grow (Covello and Mumpower, 1985). And, if cynics suggest that this political awakening is little more than a manifestation of the ‘me first’ attitude inherent in the well known NIMBY (“not-in-my-back-yard”) syndrome, others argue that it goes far deeper than this. As one expert suggests:



"...the intensity of persuasiveness of conflict over facility siting and other forms of development can not be explained just by reference to parochial self interests. NIMBY issues are founded on more widespread doubts about the fairness and effectiveness of existing processes of decision making (Sadler and Armour, p.1).

In fact, the NIMBY syndrome so frequently witnessed in cases of the siting of risky technologies represents what has been called a "crisis in confidence" in the ability of governments and industry to manage risk, uncertainty and conflict (Sadler and Armour, p.2). Moreover, the level of public confusion surrounding issues of risk has been further increased by the competing risk analyses of government, industry and citizen groups (Covello and Mumpower, 1985).

It is not so much that one group or the other is engaging in misinformation campaigns (though, on occasion that certainly should not be ruled out). Rather, it is more the case that estimates of risk, whether by scientists or lay people can not escape a certain degree of subjectivity. And, seemingly, subjectivity is nearly ubiquitous from the framing of questions, to the designing of experiments, to the weighing of the social importance of risk. For this reason, the 'degree of disagreement' with respect to risk estimates can differ widely between experts and the lay public, or even among scientists themselves (Lowrence, 1980).

The inevitable result of such divergent agendas has been an obvious division in the institutions established to deal with the concept of risk; namely, risk assessment (RA) and risk management (RM).

Risk assessment is essentially the technical/ scientific response to risk--the

attempt by experts to quantify risk so as to minimize the effect and likelihood of its negativity. Risk management, while not discounting the knowledge gained from these scientific assessments, incorporates “softer” factors--political, economic, social, ethical--into the risk decision making calculus. The two disciplines (risk assessment and risk management) consequently measure different types of risk: objective or “real”, versus subjective or “imagined” respectively. Not surprisingly, the two measures seldom, if ever, seem to agree (Kasper, 1980).

Others are quick to build upon this state of affairs by arguing that the emerging socio-political realities of contemporary environmental/ development conflict suggest a rationale for considering alternative approaches to the conventional technically based process (Sadler and Armour:1-5).

Others suggest **decentralization** of decision making for ethical reasons. Offers one critic of the status quo, “balancing the benefits against the risks belongs not in the domain of science but to society. The judgement is a value judgement--a social rather than scientific decision” (Sadler;1979:73). Concur another, “the decision on socially acceptable risks which imply the calculation of costs/benefits should not necessarily be confined to an elite group, but rather be established through a consensus of society as a whole and/or its representatives assisted by experts” (Higginson; 1976:361). Still another offers practical reasons behind the “important role” of the risk management process in resolving controversy and uncertainty in the policy arena. These would include an examination of the ability of agency and manpower information-processing resources to cope with the technical advances and

demands of risk assessment techniques, and consideration of conditions under which organizations should modify their arrangements or decision making structures in response to risk (Zimmerman;1986).

The question, therefore, of how far society should go in providing for prevention from, and compensatory protection against risk is quintessentially a political question in that it involves the allocation of public resources. As such, these questions require collective decision making processes as a minimum requirement in the search for solutions (Rescher; 1983). A brief examination of current decision making processes (whether truly collective or not) is therefore in order.

## 1.2 Environmental Assessment Processes

Environmental assessment is an important instrument for controlling development activities (including the siting of risky technologies) with both federal and provincial governments having produced various systems for the conduct of such processes (Couch; 1985).

Review of recent EIA experience has identified problems including the effectiveness of these processes with respect to satisfactory dispute resolution (Sadler; 1987). While environmental assessment has been growing in scope as a result of attempts to accommodate public concerns, this change has conspicuously avoided any major adjustments to the structure of the process (Sadler and Armour).

Others are less diplomatic with one outspoken critic referring to environmental reviews as a “dialogue of the deaf” typically characterized by delay and obstruction

(Sadler; 1986) Others have branded the traditional approach with the acronym DAD--decide, announce, defend (Susskind; 1985)--hardly reference to a consensual style of process!

This is not to say that progress is not occurring or that alternative means of dispute settlement for risky and other environmental issues are not being studied and often recommended. Indeed, as a response to increasing conflict in environmental disputes, interest in, and explicit use of, consultative and negotiative modes of resolution (as opposed to the traditional more authoritative mode of 'resolution') is occurring (Dorcey and Reik:7-23).

Specific suggestions for the linking of negotiated and mediated forms of dispute resolution with the traditional authoritative approach include the restructuring of the process as a joint fact finding phase in a negotiated process (Susskind; 1984), and the introduction of negotiation procedures to supplement and improve the effectiveness of the process at "key stages" in the process (Sadler; 1986).

All too often however, the process continues to involve but minimal interaction and dialogue between a reticent public and a development minded protagonist (Sadler; 1979). If significant progress is to be made, it will be necessary to move to bridge this formidable gap so that the 'soft' concerns inherent in the management of risk are fairly and equitably incorporated into the decision making process, still predominantly governed by technical considerations.

### **1.3 A Word on Uncertainty**

The elements of chance is, of course, always present in risky situations. There

is also however, the possibility that the situation can become still more complicated for cases in which the element of uncertainty is introduced into the equation. Uncertainty can be defined as “the indetermination, through ignorance or otherwise, of some of the **characterizing** elements of a risk situation” (Rescher;1983:94) and can take three different forms: probability uncertainty, result uncertainty, and outcome uncertainty. Nuclear plant meltdown for example is rather high on the probability uncertainty scale largely because of the vast degree of theorizing necessary to obtain a risk estimate (Certainly a lot of estimates were revised following the Three Mile Island and Chernobyl accidents)

Other risky and potentially risky technologies such as electromagnetic radiation exhibit uncertainty across the spectrum. As one epidemiologist summarized “for electromagnetism, we only have a few studies, so its much too early to tell [whether risks are, or are not, involved]” (Brady; 1990). Certainly a lot of evidence exists suggesting that risks are not involved with electromagnetic technologies such as microwave radiation. On the other hand, studies carried out in the United States during the past two decades have produced “some evidence” linking exposure to electromagnetic fields with high rates of brain cancer and leukaemia among electrical workers and children living near high current power lines (Brady; 1990). Thus, in a number of cases, the matter of risk is further complicated by uncertainties as to the likelihood and magnitude of the risk outcome.

Some have gone so far as to claim that the uncertainties attached to any risk estimate are “as important (if not more important) than the risk estimate itself” and

should therefore always be incorporated (Crouch and Wilson; 1982). Perhaps it is not unreasonable to suggest that uncertainty in any risk calculus should argue effectively against the authoritative approach to decision making still so widely deployed in our contemporary environmental assessment processes.

## 20 METHODOLOGY

### 21 Introduction of the Proposed Research

From the outset it was hypothesized that the wilful separation of risk assessment and risk management into mutually exclusive components of the assessment of environmental impacts was artificial and destabilizing, particularly at a time of heightened environmental concerns and public participation. Conversely the integration of the “softer” concerns of risk management and risk perception-- psychological, social, political, ethical --with the harder scientific concerns of risk assessment was seen as being essential if the environmental assessment process was to reflect important changes occurring in both society’s environmental consciousness, and its increasing reliance on risky and potentially risky technologies. Furthermore, the integration of these two related disciplines into one, was seen as maintaining an analytic and educational role for the risk assessment process, while concurrently emphasizing strategic benefits from the ‘democratization’ of the decision making process. These benefits include: greater credibility for the decision making institutions (political and scientific) given an increased responsiveness to public concerns; and, the laying of the ground work necessary for the full maturation of public environmental consciousness.

## **2.2 The Case Study Method**

This being said, the question arises as to how these hypotheses can be tested. In that the focus of the research was on perceptions of risk and environmental decision making, a case study was considered to be a good method of approach.

Although this approach is not without limitations, it provides an excellent method whereby it is possible to gain valuable insights about a specific instance, and while these results are not readily generalizable, they do in fact help to provide a better understanding of fundamental relationships which exist and may help to give direction to future research.

### **2.3 The Wolfe Island Case Study**

After careful consideration, the proposed construction by Bell Canada of a 110 foot microwave tower on Wolfe Island, a small island community, near Kingston was selected as a suitable case study. Reasons for this choice include:

- a) visible community activity with respect to the project;
- b) evident social implications related to the construction of the tower;
- c) the proximal ease of administering the survey instrument and of monitoring the project;
- d) the suspected non-rationality of the public risk perceptions;
- e) the importance of Bell as a significant corporate environmental actor;
- f) the well defined parameters of the project in question, and the uniqueness of the community under consideration;
- g) the presence of alternative environmentally “friendly” solutions to the perceived problem;

h) the financial capability of Bell to consider such options.

## 2.4 Testing the Hypotheses

After selecting the case study, the next step was to develop an instrument which would allow for the validation or rejection of the stated hypotheses. In order to test the different hypotheses proposed it is necessary to develop indicators which would allow one to measure such factors as individual perceptions of risk; perceptions of the current process for environmentally risky decision making; and, attitudes toward public participation. For this particular study, it was felt that a survey administered to all those who participated in the public meetings relating to the construction of the Bell microwave tower would be a valid tool for obtaining the necessary information.

## 2.5 Designing the Survey Instrument

**The** survey itself, was divided into three broad sections with the majority of the questions being closed ended. The first section was designed to develop a measure of individual perceptions of risk. Here the questions focused specifically on the level of opposition to the tower, the physical proximity of the tower, factors influencing opposition to the tower; perceptions of the tower as a health hazard; and attitudes toward expert opinion.

The second section of the survey concentrated on measuring individual perceptions of the process. Here the questions addressed perceptions of individual roles, levels of satisfaction/dissatisfaction with the process, and perceptions of the need for changes to the process.



The final section dealt with attitudes toward public participation and questions as to how the public could, or should, be more meaningfully incorporated into the process; and whether the public was deemed fully capable of contributing in a meaningful way.

## 26 **Pre-Testing** the **Survey**

Because there was no record of names of those attending the public meetings, Bell officials were relied upon to identify the key actors. These individuals were used as a pre-test for the survey. During the pre-test there did not appear to be any difficulties with the survey instrument, and therefore no revisions were necessary. The next step then, was to administer the survey to the population as a whole.

## 27 The **Sampling Strategy**

**The** survey was administered to all individuals who participated in the public meetings concerning the construction of the Bell tower on Wolfe Island, and to “experts” who were familiar with this particular case.

Because there was no formal list of participants at the public meetings, a “snowball” technique was employed. This technique relies on key informants to identify all those who were involved in the process. Following the completion of an interview, each respondent would be asked to provide names of others who had also been involved. This technique was used until such time as no new names were being identified.

The “close knit” nature of the island community and the relative solidarity

among participants at the public meetings suggested that this technique would prove to be a good strategy for identifying the population to be surveyed. However, there is always the possibility that certain information gaps exist from unfamiliarity with certain individuals attending the meeting or from lack of recall. However, given no record of attendance was kept--neither by Bell nor by the Wolfe Island Council--there were few alternatives available.

With respect to the surveying of the technical experts, three Bell officials were contacted and interviewed. As well, individuals from other agencies who had in some way been involved in the process (i.e. Health and Welfare Canada; the Department of Communications) were considered as technical experts, but their lack of familiarity with the issues specific to the Wolfe Island case, excluded them from consideration.

## 2.8 Analysis of the Findings

The next section of this report will deal with an analysis of the findings. It will be structured in a format similar to the survey. Specifically, analysis will occur within the following sections: an examination of individual risk perceptions; an exploration of the perceptions of the actual process; and, an examination of ways in which the public may be more meaningfully incorporated into the process. However, before each of these sections is discussed it is important to provide a general background to the situation on Wolfe Island.

### 3.0 BACKGROUND INFORMATION

Wolfe Island is a large island, 13,538 square hectares, located at the head of

the St Lawrence River approximately one mile south of Kingston. It takes approximately twenty minutes to reach by ferry. According to the 1990 Municipal Directory the entire population numbers some 1,053 individuals with farmers, labourers, retirees and artists heavily represented.

The Town Council is located in Marysville, a small village of some 150475 households located on the northern coast of the Island. Marysville is not only the most densely populated part of the Island, but also the site of the ferry dock taking people to and from the mainland.

The Bell tower itself is located on a high point of land, at the southeast corner of Marysville. The nearest home to the 110 foot tower is no more than 500 feet away, with perhaps four or five more households located within 1000 feet. Apart from the Bell tower, Marysville is conspicuously surrounded by ten other radio and television towers. Furthermore, the ferry that connects Wolfe Island to Kingston is constantly transmitting radar signals to and from points located in Marysville. Consequently, the Islanders are concerned about not only the possible effects of the Bell tower, but also the cumulative effects emanating from all sources.

The Bell tower itself, was first proposed in early 1988 and built in 1990. Clearance for the construction of the tower came from Health and Welfare Canada in October of 1988, at which time Bell initiated a public meeting to discuss the proposed tower. A second meeting was held in December. Much of the following discussion focuses on the events and outcomes of these two meetings.

#### 4.0 AN EXAMINATION OF INDIVIDUAL PERCEPTIONS OF RISK

##### 4.1 Public Involvement and Perceived Levels of Riskiness

The survey results indicated a number of reasons why people became involved in the public debate over the construction of the Bell microwave tower. Of the 22 private citizens interviewed, the majority (20 out of 22 or 91%) indicated that they were opposed to the construction of the tower, while the remaining 9% (2 out of 22) indicated that they were not opposed. From these findings, suggest that public resentment and opposition to the tower was high amongst those attending the public meetings. As well, it soon became evident that the perceived risk was one of the greatest reasons for this opposition.

##### 4.2 Reasons for Opposition

A number of concerns were raised by those interviewed. Although the associated health risks were identified as the most compelling reason for opposing the construction of the tower, respondents also cited concerns over the negative impact on property values; and, Bell's apparent lack of integrity with respect to its dealings with the Islanders as reasons for involvement.

Table 1a shows that 17 out of 20 respondents (85%) who were opposed to the tower, indicated that their opposition stemmed from health related concerns. Additionally, 40% felt that property values were an important consideration, while 20% expressed concern over Bell's perceived lack of integrity.

Table 1a.

<i>REASONS CITED FOR OPPOSITION TO THE PROJECT</i>			
	Cumulative Count	%	Strongest Reason
Potential Health Risks	17	85%	16
Property Values	8	36%	1
Corporate Integrity	4	20%	3
Total Sample	20		

#### 4.3 Property Values

The negative impact on property values was identified as a concern by 36% of the respondents (8 out of the 22). However, only one of the eight identified this as their top concern. When asked if they would accept, or consider accepting the Bell tower if the community were offered compensation, none of the respondents felt this to be an acceptable alternative. This strong ambivalence to suggested compensatory measures would reinforce the sense that economic concerns (i.e. property values) were secondary.

#### 4.4 **Mistrust** of Bell

The perceived lack of integrity in the way Bell dealt with the Islanders was cited as another reason for opposition to the tower. In particular, the Islanders

**were** concerned with the fact that Bell had not lived up to its assurances that they respect the decision of the Wolfe Island Council regarding the construction of the tower. In **spite** of the fact that Council voted unanimously to reject the proposed tower, Bell ultimately continued with their project.

Upon questioning Bell officials about this matter they admitted that the assurance to respect Council's decision had been made without adequate authority and was essentially a strategic error on their part. This error was identified by 3 out of the 20 (15%) of those opposed to the construction of the tower as their primary concern, while a number of others indicated this to be a point of contention.

To an extent, this concern is different from the others in that it reflects ethical considerations of corporate responsibility rather than responding to the pragmatic concerns of property values and potential health risks.

#### 4.5 Riskiness **of the Project**

Survey findings suggest that concerns about health and the perceived riskiness of microwave technology dominated the public agenda. Not surprisingly, of those who attended the public meeting, (20 out of 22) or 91% were opposed. Furthermore of these, 85% (17 out of 20) cited health concerns as their most compelling reason for opposition. Such findings clearly suggest that the perceived riskiness of the project was a significant contributing factor to the level of public opposition.

In terms of the level of risk posed by the project, 77% (17 out of 22) indicated

that they perceived it to be a significant risk. Furthermore, the overwhelming majority identified health related risks as being their most fundamental concern: 82% (18 out of 22) indicated that they felt there to be a possibility of an increased risk of cancer with ~~the~~ construction of the tower; 77% (17 out of 22) felt that the increased risk of cancer was either somewhat or much more likely to occur upon completion of the project; while, 17 out of 22 (77%) felt that it was very likely or somewhat likely that at least one of the local residents would contract cancer (or some other microwave-linked disease) as a direct result of the tower.

Table 1b.

<i>PERCEPTIONS OF THE RISK TO HEALTH</i>	
	Count
Belief that the tower <u>could</u> lead to an increased risk of cancer amongst local residents.	18
Belief that there will be a higher incidence of microwave linked disease upon completion of the project.	17
Belief that one or more of the local residents will contract a microwave related disease as a direct result of the tower	17

Table 1b not only shows the perceptions of the health risk related to the tower, but it also shows that there is little difference between the number who believed that the construction of the tower could lead to an increased risk of cancer among the local residents (82%) and the number who believed that the tower would lead to an increase in cancer among local residents (77%). From this, one could conclude that, in the minds of the public, the perception of risk is almost inseparable from its actual occurrence.

#### 4.6 **Public Scepticism of Expert Opinion**

**The** level of scepticism held by the citizens toward expert opinion was another indicator used to measure the public perception of risk. Implicit in this measure was the assumption that public uncertainty over the riskiness of the technology would elicit a significant level of opposition.

According to the findings of the survey, when asked whether government and widespread scientific opinion denying significant associated risks would be convincing enough to make opposition unwarranted, all 22 respondents replied that it would not be. Furthermore, with respect to the Bell proposal, and in spite of assurances from Health and Welfare Canada that “the exposure levels at ground level are more than many thousand times below the maximum level permitted in our safety code” and that “the type of installations in question do not pose any likelihood of exposure to radio-frequency radiation at ground level even remotely considered hazardous”, 19 out of 22 respondents (86%) indicated that such assurances gave



them no more confidence as to the safety of the project. The remaining three respondents held varying degrees of confidence from “very much more” to “not much more”.

These findings suggest two things. First, expert assurances do not appear to help persuade the public when uncertainty is associated with a given technology. Second, even those few who appeared to be at least somewhat reassured by the opinions of experts expressed varying degrees of confidence in these assurances.

Some of the scepticism of expert opinion could stem from the fact that widely differing risk estimates exist even within the scientific community and that the public nervously reflects this uncertainty in its risk perceptions. As well, some of the scepticism could result from the belief that the experts, such as the Bell officials, have a vested interest. However, the survey findings revealed that the public was as equally uncertain of ‘neutral’ experts, such as Health and Welfare Canada. Essentially, this would serve to underline the apparent widespread uncertainty felt by the general public toward complex technologies, such as microwave towers.

#### 4.7 **Confidence in Individual Risk Perceptions**

**The** uncertainty however, was not restricted to attitudes toward expert opinion. Indeed, the public expressed little more confidence in the validity of its own opinions and perceptions with respect to the potential health risks. In fact, 15 out of the **22** respondents (68%) indicated that they would admit that their risk perceptions could possibly be incorrect, while six others, (27%) believed themselves

to be certain in their risk perceptions.

In addition 16 out of the 22 (73%) felt that there was the possibility that the general public has a tendency to either over- or under- estimate the actual potential for harm from risky technologies. In terms of the Wolfe Island situation 12 out of the 22, (55%), felt that this was the case, with most of these, 58% (7 out of 12) feeling that the potential for harm was if any thing over estimated. Such findings suggest that the public is sensitive to, and honest about their own uncertainties regarding risky technologies. They may be highly sceptical--even contemptuous--of expert opinion, but they would appear to be almost equally unsure about their own risk perceptions.

Although the findings indicate a strong degree of concern over the potential health risks of the tower, at another level there seems to be a profound respect for the uncertainty associated with the project. The conspicuously high levels of scepticism with respect to expert opinion, when considered in concert with the surprising frankness of respondents to admit to their own uncertain perceptions of risk, draw particular attention to the power of uncertainty in cases of the introduction of “risky” technologies. Essentially, the public seems to be admitting that they really do not know what the consequences of microwave radiation might be, but that even a lingering uncertainty seems to be sufficient rationale for them to resist the unknown (i.e. the Bell tower) in spite of assurances from both Bell and Health and Welfare Canada.

## 5.0 **PERCEPTIONS OF THE PROCESS**

It is evident from the level of opposition to the tower that the public process did little to resolve the contentiousness of the issue. However, an examination of the process will nevertheless prove instructive for the purpose of, identifying potential improvements in the future.

In the case of the Wolfe Island study, the public process consisted of two meetings, both initiated by Bell. These meetings were held on Wolfe Island, in October and December of 1988 and were intended to provide the public with an opportunity to discuss the proposed microwave tower. As one might have expected, Bell officials were confronted with a number of requests to either move the tower elsewhere, or to provide a safer technological alternative (i.e. underwater cable).

### 5.1 **Perceptions of the Need for Changes to the Process**

Perhaps not surprisingly 16 out of 22 respondents, (73%) indicated that they felt the process needed changing, while the other 6 (27%) felt there was no need for change. It was interesting to note that even among those who indicated that the process did not need changing, a certain dissatisfaction prevailed, typically directed at Bell. As one respondent indicated, "its not the process. The process itself works fine. Its just that Bell will do anything they like anyway."

### 5.2 **The Public's Top Priority For Change**

A number of interesting results were obtained when the public was asked to rank at which level-- government, corporate, municipal, or private-- they felt changes to the process were most necessary. In looking at the rankings some

evident trends emerged. The following table (Table 1c) shows the public's emphasis in terms of the areas most in need of change.

Table 1c.

<i>CHANGES TO THE PROCESS: TOP <b>PRIORITY AREAS</b> IDENTIFIED</i>		
	<i>No. of Respondents</i>	<i>%</i>
Corporate Responsibility/Sensitivity	9	41%
Citizen Involvement	4	18%
Government Regulation	4	18%
Municipal Opposition	4	18%
Non Response	1	5%
Total	22	100%

Such findings indicate a modest concern for changes in citizen involvement, municipal opposition, and government regulation, and a more substantial emphasis on corporate responsibility.

### 5.3 The **Second Highest Priority Area**

**The** individual rankings for the second highest priority area, also yielded interesting results. Here, government regulations (such as tougher radiation standards) was the most frequently cited area. In total, 9 out of 22 respondents (41%) placed an emphasis on this as a priority area. This was followed closely by corporate responsibility, with 8 out of 22 respondents (36%) ranking this as their

second highest priority area. Municipal opposition was ranked as the second highest priority area by 2 respondents, while there were three who did not respond at all. No one ranked “citizen involvement” as their second highest priority.

*Table 1d.*

<i>CHANGES TO THE PROCESS: SECOND PRIORITY AREAS IDENTIFIED</i>		
	<b>No. of Respondents</b>	<b>%</b>
Government Regulation	<b>9</b>	<b>41%</b>
Corporate Responsibility/Sensitivity	<b>8</b>	<b>36%</b>
Municipal Opposition	<b>2</b>	<b>9%</b>
Citizen Involvement	<b>0</b>	<b>0%</b>
Non Response	<b>3</b>	<b>14%</b>
<b>Total</b>	<b>22</b>	<b>100%</b>

#### **5.4 Public Priorities for Change: First and Second Priority Areas Identified**

Table 1e shows the distribution of individual rankings for ‘first and second priority areas. It is interesting to note that 17 out of 22 (77%) ranked changes to corporate responsibility/sensitivity as either their first or second priority area. This was followed by government regulations at 13 out of 22 (59%), before the count dropped to 6 (27%) for municipal opposition and 4 (18%) for citizen involvement.

Table 1e.

<b><i>CHANGES TO THE PROCESS: TOP PRIORITY AREAS IDENTIFIED (ranked as either <u>first</u> or <u>second</u> priority)</i></b>		
	<b>No. of Responses</b>	<b>% of Respondents</b>
Corporate Responsibility/Sensitivity	17	77%
Government Regulation	13	59%
Municipal Opposition	6	27%
Citizen Involvement	4	18%
Non Response	4	18%

These findings suggest a number of things. First, it would appear that the public places the greatest emphasis on corporate responsibility and government regulations respectively, while there would appear to be less priority given to local (municipal and citizen) initiatives. This could be attributed to the fact that the public perceives that decision making with respect to environmentally risky technologies occurs largely at the institutional (corporate and government) level, and that changes at these levels are therefore most necessary.

### **5.5 The Emphasis on Corporate Responsibility/Sensitivity**

Seventy-seven percent of the respondents (17 out of 22) ranked corporate responsibility/sensitivity as one of the areas most in need of change. Of these, 53% (9 out of 17) indicated that changes in this area would be their first priority. It is

important to note that the surveys were conducted shortly after the tower had been constructed, and mere days after it had been put into operation. It would have been interesting to have solicited responses to this same question soon after the public meeting in which Bell indicated a willingness to respect to wishes of the Wolfe Island Council.

The results of the survey clearly indicated that the Islanders were very much of the opinion that Bell could have exercised a much greater measure of public spirit to arrive at a more acceptable solution. Opinions as to what might have constituted a better solution varied from a suggestion that Bell consider other more expensive options to the tower (such as an underwater cable), to a suggestion that Bell communicate “honestly” with the Islanders;--a reference to Bell’s broken promise with respect to the wishes of Council.

The public by and large seemed to indicate that they felt excluded from the process and that Bell seemed to hold little regard for public input. Indeed, 55% (12 out of 22 respondents) indicated that they felt the public had not been adequately incorporated into the process and 9 out of 22 (41%) indicated that they felt that the process would have benefitted from greater public input.

It would appear then, that the public meetings were initiated largely for the purposes of informing/educating the public about the safety of the technology with very little interest in soliciting public input. Given Bell’s belief in the safety of this technology perhaps they felt that this approach was adequate. However, with respect to electromagnetic technologies a significant and well respected component

of the scientific community still express serious concerns over the risks involved. Such concerns were poorly addressed resulting in a significant level of resentment toward Bell.

#### 5.6 **Government Regulation as a Priority Area**

**The** high priority given to government regulation is another important finding to consider. Thirteen of the 22 respondents, (59%), ranked government regulation as an area in need of changes with 4 out of the 13 (31%) indicating this as their top priority.

The emphasis by the public on government regulation can be interpreted in a number of ways. It could be that the public **recognizes** that government regulations play a critical role in environmental decision making and that if changes are to come, government action will be instrumental. Or, it might be that at present the public is dissatisfied with the regulatory policies in place, and they feel that it is time to re-examine these policies. Survey findings reinforce this point. When it came to assessing whether the public should be more tolerant or more critical of government regulations, 20 out of 22 (91%) indicated that the public should be more critical. Only 2 respondents indicated that the public should be less critical. Overall, these findings would clearly indicate that the present level of satisfaction with government regulations is quite low.

In truth, government agencies concerned with environmental decision making in matters involving environmental risk and uncertainty appear to be in a difficult and awkward position in that they are increasingly being called upon to play a



dual role. On the one hand, the government is in the awkward position of funding research into the effects of risky and/or potentially risky technologies (Brady 1990:43-44), while on the other hand, they are (publicly) trying to maintain the near absolute safety of such technologies. Such actions clearly reveal the underlying uncertainties which exist.

Furthermore, with the increasing necessity for “risky” technologies, and the associated levels of uncertainty with respect to their use, the point is quickly approaching where a decision will have to be made as to whether to incorporate the public and its perceptions of risk into the environmental assessment process; or, whether to adhere to the usual practice of relying on technological sovereignty and scientific wisdom alone. How the various agencies respond to this challenge should go a very long way in determining the degree to which the public has input into policies regarding issues of environmental health and risky technologies.

### **5.7 Municipal Opposition/Citizen Involvement**

Although the majority tended to feel changes were most necessary at the corporate or government level, 6 out of 22 (27%) ranked municipal opposition as a high priority, while 4 out of 22 (18%) ranked citizen involvement highly. For this group, more active involvement at the local level was the solution. One respondent went so far as to rank only citizen involvement as needing change, claiming that the other categories would inevitably follow once citizens became more aware and politicized.

Interestingly, those advocating change at either the citizen or municipal level

were far more likely to hold unchangeable opinions. When comparing those who favoured local initiatives (municipal opposition and citizen involvement) to those who advocated changes at the “institutional” level (corporate and government), essentially there was no difference in the overall number who indicated that their positions were “unchangeable”. That is, out of the total of 22 respondents, 13 or 41% indicated that their positions were unchangeable, with 7 (54%) being advocates of local initiatives and 6 (46%) being advocates of institutional changes. However, when comparing the level of inflexibility within each group, it would appear that the local activists were twice as likely hold unchangeable opinions, while the level of inflexibility among respondents advocating changes at the institutional level was more evenly distributed. This lends support to the suggestion that grass roots activists tend to be more radical and less susceptible to any form of suasion. Given their views tend to be more inflexible, it could prove to be more difficult to incorporate this group into the process.

The following table (Table 1f) shows that those advocating local initiatives have a higher propensity to hold unchangeable opinions.

Table If.

<i>FLEXIBILITY IN OPINION BY PRIORITY RANKINGS</i>			
<u>Flexibility of Opinion</u>			
<b>Emphasis</b>	<b>Unchangeable</b>	<b>Willingness To Change</b>	<b>Ratio</b>
Corporate /Government	6	6	1:1
Municipal/ Citizen	7	3	2.3:1
Total	13	9	1.4:1

**5.8 The Confrontational Nature of the Process**

It would also appear that the process itself invited a certain level of inflexibility. Of those surveyed, 15 out of 22 (68%) indicated that they felt the process was largely confrontational while only 6 (32%) indicated that the process allowed for consensus building among the actor involved. Perhaps such results are to be expected given: (a) the recent failure of the citizens to have any impact upon Bell’s decision to locate the microwave tower; and, (b) the historical lack of public influence on environmental decision making.

**5.9 Measures for Minimizing Confrontation**

Forty-one percent (9 out of 22), felt that opposition to the project might have been altered had the process allowed for further public input, while another 41%, (9 out of 22), believed that opposition to the project resulted from poor

communication among the various actors. Finally, **23%**, (5 out of 22) felt that a longer and more comprehensive process would have been of value in reaching an optimal solution.

Table 1g

<i>FACTORS AFFECTING THE LEVEL OF CONFRONTATION</i>		
	No. of Responses	%
Not enough public input	9	41%
Poor communication	9	41%
Process was not comprehensive enough	5	23%

These findings suggest that there are a number of areas where the public felt that confrontation/ opposition could have been minimized. Of these, better communication and greater public input were identified as the main areas in need of improvement, while to a lesser extent, the need for a longer more comprehensive process was also included.

Only 5 out of 22 respondents (23%) indicated that they felt a longer more comprehensive process would have been of value in reaching a better solution. This would suggest that although some may have felt that the extent of the process was too limited, the majority (77%) did not feel this was the case. Furthermore, when asked specifically if the process allowed critics and opponents sufficient time

to air their concerns, over two thirds of the respondents (15 out of 22) indicated that they were satisfied, while 7 out of 22 (32%) claimed that there was insufficient time. This raises the question as to whether the structure of the process itself is flawed (i.e. insufficient time) or whether the problems lie more with other factors such as poor communication or simply lack of public input.

In the case of opposition resulting from poor communication between the principal actors, many of the Islanders volunteered that Bell's reversal on the matter of respecting Council's decision, poisoned the atmosphere. While this reversal was both unfortunate and unintended, the damage was extensive and largely irreversible. Had this promise never been made the vehemence of opposition might well have been somewhat diminished.

The need for greater public input into the process was also identified by a significant number of respondents as a problem area. Indeed, 9 out of 22 respondents (41%) indicated that they felt that a certain level of resistance would have been eliminated had the public been allowed to have more input into the process. Furthermore, 12 out of 22 respondents (55%) indicated that they had not been adequately incorporated into the process. Moreover, of these, fully 75% (9 out of 12) indicated that they felt the public could have contributed to the process in a more meaningful way. Such findings clearly suggest that the public has a strong desire to take a more active and meaningful role in the process and that insufficient avenues currently exist for such input.

Table 1h

<b><i>INDICATORS OF THE PUBLIC WILLINGNESS TO TAKE A MORE ACTIVE ROLE IN THE PROCESS</i></b>		
	No. of Responses	%
Public was not adequately incorporated into the process	12	55%
More public input would have helped to ameliorate opposition	9	41%
Public could have been incorporated into the process in a more meaningful way	9	41%

#### 5.10 Resource Constraints

Although the public has indicated a willingness to take a more active role in the process, they have also recognized that when dealing with complex technologies they are operating under certain constraints. These constraints would include limitations on their time, knowledge and financial resources. Indeed, when asked whether they felt that the process had supplied them with the resources necessary for them to air their concerns, 18 out of 22 respondents (82%) indicated that this was not the case, with only 3 respondents (14%) indicating satisfaction. If there is to be a commitment to make the public a more equal actor in the environmental decision making process, measures to ensure that adequate resources be made

available should be taken.

## 6.0 INCORPORATING THE **PUBLIC INTO THE PROCESS**

Given 55% (12 out of 22) indicated that the established process was inadequate, and that the public wishes to assume a more active role in environmental decision making, the question arises as to how this can be accomplished.

If the public is ever to be incorporated into the process, all parties concerned must be reasonably satisfied that the public is in fact a serious and capable participant. While it might be unreasonable to expect professional expertise on the more subtle scientific aspects of the problem; public inputs need to be constructive and responsible. Traditional thought viewed the public as being by and large incapable of dealing with important matters of policy. Thus policy makers would control the decision making process by resorting to technical expertise and the 'objectivity' of science as a rationale for their actions (Friedmann,1987:137-179) However, society has been changing rapidly and a more politicized and informed public has been taking the forefront. (Cairns,1986; Friedmann,1987). Public activism on issues of potentially risky environmental projects would reflect this growing phenomenon.

### 6.1 **Ability of the Public to Make a Meaningful Contribution**

When asked whether the public would be both willing and able to make environmental decisions that are economically, scientifically and socially responsible 15 out of 22 respondents (68%) replied that such decision making would be

possible while 5 out of 22 (23%) felt that responsible decision making was beyond the ability of the general public. Two out of 22 (9%) claimed not to know. Overall, the public would appear to have a significant level of confidence in their ability to make a meaningful contribution and a willingness to assume a more active role.

## 6.2 **Self Education**

This was reinforced when respondents were asked if there would be a stronger inclination for self education on environmental matters should the public be more meaningfully incorporated into the process. Twenty one out of 22 respondents (95%) felt that this would be the case, while only one respondent felt that the inclination for self education would not increase. Such findings clearly indicate a willingness on the part of the public to assume a more responsible and active role should they be given the opportunity to have a more equal input into the decision making aspects of the process.

## 6.3 **The Role of the Public: Personal Orientation**

When asked to indicate which **characterization** was most representative of their personal inclinations, 10 out of 22 respondents (45%) indicated a willingness-- indeed a desire-- to engage in constructive, consensual dialogue with technical experts, while another 45% (10 out of 22) indicated that the public should have the ultimate decision. Only 2 out of 22 (9%) indicated that the public was not sufficiently versed to contribute to decisions regarding environmentally risky technologies. For this group, the belief was maintained that regulators and experts



alone should be the ones to decide.

Table li.

<b>PERCEPTIONS OF THE ROLE OF THE PUBLIC</b>		
	Count	%
In that it is ultimately members of the general public who have to live with the risks of the Bell tower, it should be <u>the general public</u> who decides whether or not to accept the tower in their community.	10	45%
In that the general public is not sufficiently versed in matters of microwave radiation, it should be up to <u>regulators and experts</u> alone to decide whether the tower should be built on Wolfe Island.	2	10%
In that risk incorporates both technical (expert) and <b>socio/political</b> (public) considerations, the decision whether or not to construct the Bell tower should reflect a consensus between the two.	10	45%

These findings suggest a number of things. First, although the public is highly sceptical of expert opinion, it would appear that the majority (12 out of 22 or 55%) **recognize** that experts play a critical role in the decision making process and that of these, **45%** feel that a consensual relationship between experts and the public would generate the best results.

#### 7.0 RESPONSE FROM BELL OFFICIALS

As previously mentioned, the survey was also administered to 3 Bell officials

familiar with the Wolfe Island situation. These interviews were conducted both in person and over the telephone. In addition to the survey, a free and open ended discussion of the issues typically ensued. As might be expected, the Bell officials gave responses quite different from the general public. However, before looking at Bell's responses a brief discussion of some background information should help to provide a better understanding of Bell's perspective.

### 7.1 Background Information

Bell has microwave towers located every 30 miles over the countryside and presently, is engaged in a major 'modernization mode' of which the Wolfe Island tower is but one component. This modernization is, according to Bell, necessary to introduce the most modern, convenient and immediate of services to outlying areas.

Engineers from Bell, calculated the radiation level for the proposed tower and found it to be well within the acceptable limits established by government standards. Correspondence from Health and Welfare Canada indicated that Bell's calculations were sound and that:

“the exposure levels at ground level are more than many thousand times below the maximum permitted in our Safety Code” [such that] “the type of installations in question do not pose any likelihood of exposure to radio-frequency radiation at ground level even remotely considered hazardous”

Based on this, and their own belief in the safety of their technologies Bell felt that they had entirely fulfilled their responsibility. Furthermore, armed with these

assurances, Bell felt that it was unnecessary to consider more costly alternatives such as an underwater cable. According to Bell this alternative would cost an additional \$250,000 and would set a costly and entirely unnecessary precedent. Consequently, they continued with their original plans for modernization.

## **7.2 Bell's Risk Perceptions**

As was to be expected, the results from the Bell survey differed radically from those completed by the general public. Throughout, it was evident that the Bell officials were thoroughly convinced as to the safety of the tower. According to the findings none of the Bell officials perceived the tower as a significant risk, and none felt its construction could lead to an increased risk of cancer. Furthermore, all felt that a significantly higher incidence of cancer, or the chance of a local resident contracting cancer upon completion would be very unlikely. Additionally, they felt that the assurances provided by Health and Welfare Canada gave them very much more confidence as to the project's safety. As one official said, "it gave us 100% confidence".

Finally, all of the Bell officials felt their risk perceptions to be correct. Furthermore, they felt that the public frequently has a tendency to overestimate the actual potential for harm from "risky" technologies both in, general, and with respect to Wolfe Island in particular.

## **7.3 Bell's Perceptions of Changes to the Process**

When asked for their perceptions of the process, again there was little disagreement among the Bell officials. The only difference in opinions was in

response to the question about the need for changes to the process. Although two out of the three respondents felt that changes to the process were not necessary, one official felt that the process should be less confrontational. However further questioning revealed that this official was mostly concerned about the unpleasant interpersonal dynamics of the process rather than the actual structure. Furthermore, they felt that public acceptance of expert opinion was the only change they could suggest, which would improve the process.

#### **7.4 Measures for Minimizing Confrontation**

All three representatives also felt that increased public input would not have resulted in less opposition to the tower. Furthermore, all three felt that the process itself was inherently confrontational, and that a longer and more comprehensive process would not have been of any value in helping to reach an optimal situation. Finally, all three of the officials were convinced that poor communication between actors was not a factor in creating opposition despite their admitted error in reassuring the public that Bell would respect the decision of the Wolfe Island Council.

These results make it clear that Bell did not perceive the process as a means of achieving a common understanding. From the stated inflexibility of their position (all three respondents indicated that their views were unchangeable) to the acceptance of the confrontational nature of the process and the opinions that more public input or a longer more comprehensive process would be of no value, it is evident that the Bell officials maintained the belief that the process is destined to

be highly contentious, and that they held little hope of ever resolving any of the problems.

This position stems from the radically different opinions of risk held by Bell and members of the general public. With the gap between the risk perceptions of these two groups too vast to bridge at this point in time, there is little recourse for Bell but to protect its interests and to do what, in fairness, it feels to be correct and justified in terms acceptable risk. Unfortunately, this does not allow for much flexibility in the process as both sides see important interests at stake (in Bell's case, its corporate viability and the continued economical flow of services; and in the public's case, its health and the potential health risks). What consequently emerges is a process that is unsatisfactory to both parties. Furthermore, until science can provide a definitive answer as to the level of risk associated with various technologies, it is highly unlikely that the problems inherent in the process will ever be fully resolved without significant scientific advancements in the understanding of risk.

#### 7.5 The Incorporation **of the Public Into the Process: Bell's Perspective**

If Bell representatives were inflexible on matters of risk perception and perceptions of the process itself, they were no more hopeful in their responses pertaining to the incorporation of the public into the process. With few notable exceptions, Bell officials were united in their opposition to greater public input into such matters of public policy. For example, all three agreed that the public could not realistically be incorporated into the process in any meaningful way.

Furthermore, Bell officials seemed to feel that public concerns had already been adequately taken into account. According to responses provided by Bell officials, the process allowed critics enough time to raise their concerns, and allowed sufficient resources for viable opposition. As well, the officials indicated that they were of the opinion that the public is not both willing and able to make responsible decisions on such complex matters. According to one official, the involvement of the public in such matters of public policy would “grind society to a halt.”

Such results indicate a tendency by Bell to resist the meaningful incorporation of the public into the process. While one spokesperson did admit that the construction of the tower should reflect a consensus between expert and public considerations, the general intransigence by Bell spokespersons seemed to reflect the value placed on scientific and technical considerations in the decision making process almost to the complete exclusion of the public.

## 8.0 DISCUSSION

The research question posed suggested that if the EIA process were to reflect the significant changes occurring in society’s environmental consciousness then, the integration of the “softer” concerns of risk management and perceptions--psychological, social, political, ethical--with the harder scientific concerns of risk assessment was necessary. Furthermore, it was suggested that the integration of these ~~two~~ related disciplines would maintain an analytic and educational role for the risk assessment process, and would lead to other benefits from the ‘democratization’ of the decision making process. These benefits included:

- a) greater credibility for the decision making institutions (government and corporate) via their increased responsiveness to public concerns; and,
- b) greater public maturity and sophistication in such decision making.

Certainly, the findings appear to validate the stated hypotheses. The public demonstrated a clear preference for community involvement in risk management and the decision making process. As well, strong verbal indications surfaced in support of the idea that the public would develop a greater sophistication, empathy and responsibility towards the environment as a consequence of increased public input into the process. However, one critical finding tended to predominate, that being, the presence of scientific uncertainty with respect to electromagnetic technologies.

With scientific thinking being split on this matter, public incorporation can and probably should be rationalized as more than a means of enhancing institutional credibility and public maturation. Rather it becomes an immediate ethical consideration of the first degree. In other words, public incorporation into the process as a matter of heightening institutional credibility and public maturation should not and can not be of prime consideration when critical questions of human health and well being linger due to the associated uncertainty.

It is not so much that questions of institutional credibility or public responsibility are not valid--they are, as the results indicate. However, more

pressing concerns (notably health) tend to override other concerns. As such, analysis of the results in terms of the original hypotheses is possible and meaningful only after a full examination of the ethical considerations. The following section therefore will consider risk in terms of its scientific uncertainty, and the ethical and political implications of uncertainty in risky environmental decision making.

### **8.1 The Uncertainty of Risk- An Ethical Discussion**

One of the reasons for originally choosing the Wolfe Island case study was the suspected non-rationality of the Wolfe Islanders' risk perceptions; that is, the presumed absence of a 'real' health risk. However, lingering questions from the scientific community have raised legitimate concerns as to the safety of these technologies.

With such questions raised, the element of certainty has been removed from the equation. With the potential effects of microwave radiation most likely to be experienced in the long term, a worst case scenario could endanger many hundreds or thousands of individuals. This is of course highly speculative yet, the possibility does potentially exist.

Furthermore, it would appear that corporate and government institutions have not yet placed sufficient emphasis on the level of uncertainty which prevails. Comments from the Bell officials indicated that assurances provided by Health and Welfare Canada reinforced their confidence in the safety of electromagnetic technologies to the point where they were "100%" confident. However, as long as there is uncertainty within the scientific community as to the risks of microwave



radiation, then it is necessary that this uncertainty be reflected in the decision making process.

As it is the public who ultimately has to live with the uncertainty, (as distinguished from the risk, very often “perceived” as opposed to “real”) it would seem morally imperative to reflect public concerns within the process. It may well be that the public will accept the potential risks from microwave radiation just as they obviously seem to accept the real risks from driving. The point is, considerations of health in public policy, and whether the public wishes to accept the risks/costs in light of associated benefits is a matter for the public to decide. In other words, the public has a moral right (if not currently a legal one) to make the decisions pertinent to its future well being. (This of course raises the question of who constitutes ‘the public’ but that is another matter for another time.)

Ultimately, it may well be that science demonstrates beyond a reasonable doubt the absence of risk associated with technologies of this nature. However, so long as members of the scientific community continue to suspect a significant element of risk there should be no equivocating on this important ethical matter. The respectful incorporation of the public into the decision making process is both morally compelling and necessary.

## ***8.2 A Discussion of the Original Hypotheses***

Having addressed the ethical concerns, the focus of the discussion will now shift to an examination of the original hypotheses. Specifically, it was hypothesized that the integration of the related disciplines of risk assessment and risk management,

could provide for greater credibility for the decision making institutions (corporate and government) as a result of their increased responsiveness to public concerns; and, could lay the foundation necessary for a full maturation of public environmental consciousness.

### 8.3 **Hypothesis #1 Increased Institutional Credibility**

As might be expected, the majority of the public (73%) was not satisfied with the existing process and suggested that changes were necessary if the process were to realize its full potential. Interestingly enough, the majority of the public (68%) indicated that changes were most necessary at the corporate and regulatory levels.

The polarization between the public and Bell on matters of risk was a significant factor in public dissatisfaction with the process. This polarization led to a lack of understanding between the two groups and resulted in a process fraught with confrontation. On the one hand, Bell officials were 100% convinced of the safety of their microwave technologies, while on the other, the majority of the public (85%) has serious reservations.

The problem has been exacerbated by the fact that the government has been unable to take a clear position on the issue. On the one hand, its regulatory bodies such as Health and Welfare Canada deny even the remotest possibility of hazard (similar to the position taken by Bell), while on the other hand they are involved in research designed to determine the effects (or lack thereof) of electromagnetic fields. This schizophrenic position reflects the uncertainty within the scientific community.

Until it is possible to prove which position is correct, it is unlikely that two sides will ever be in full agreement. However, given the increasing use of “risky” technologies (with their associated uncertainties), the point is quickly approaching where a decision will have to be made as to whether to incorporate the public and its perceptions of risk into the process, or whether to adhere to the current practices of relying on “expert” opinion.

Furthermore, the public has indicated that they would like to be more involved. Indeed, not only did 55% of the respondents (12 out of 22) indicate that they felt the public had not been adequately incorporated into the process, but 41% indicated that greater public input would have minimized the level of opposition.

However, in spite of a willingness for more active involvement, a significant number (82%) of the public indicated that the present process did not provide them with sufficient financial and technical resources for raising their concerns.

Therefore, in order for the public to make a more meaningful contribution to the process, it is necessary to address some of its limitations. This would include making provisions for greater public input, and providing technical and financial assistance to help the public deal with the complexities of these technologies.

Even more importantly, the results of the survey indicate that for the process to be meaningful, the public has to believe in its efficacy. To be true to their principles public meetings should respond to public concerns rather than be treated as mere public relations exercises. Furthermore, given the fundamental differences in perceptions of risk it would appear that the process will remain highly

confrontational and will lead to dissatisfaction all around.

In speaking with Bell officials it would appear that they had already resigned themselves to the fact that the process was inherently confrontational, and that very few measures would help to resolve any of the problems. In their opinion, the only solution would be the public's endorsement of expert opinion. In other words, Bell is advocating that the public ignore the uncertainties associated with microwave technologies, and accept at face value the expert opinions as to the safety of this technology.

Given the level of uncertainty that currently exists it is evident that Bell's "solution" is inappropriate. Rather, the time has come for the decision making institutions to recognize that public concerns must be incorporated into the process if it is to have any value. Furthermore, until decision making institutions recognize the public's role to play in the decision making process, these institutions will continue to be confronted with an angry and demanding public.

#### 8.4 **Hypothesis #2: The Potential for a Mature and Informed Public**

**The** survey results clearly indicate that the public wants to play a more active role in decisions regarding environmentally risky technologies, with 68% of the public indicating that they feel capable of making a contribution which is economically, scientifically and socially responsible. Furthermore, 95% of the respondents (21 out of 22) indicated that the inclination for self education would increase if the public were more meaningfully incorporated into the process.

As well, although the majority of the respondents (68%) indicated that they felt

the present process was largely confrontational, a significant number (45%) indicated that their personal inclination was toward a consensual relationship with the public and experts working together to find solutions.

In addition to this, 55% (12 out of 22) indicated that they were quite willing to admit that their own perceptions may not be correct. Such an admission would indicate an openness to engage in dialogue in order to reach a negotiated solution. Furthermore, although 68% of the respondents felt that the existing process was largely confrontational, 32% indicated that they saw potential to generate decisions which would be more satisfactory to all.

Overall, the findings suggest that the public is not only willing to assume a more active and responsible role in decisions regarding environmentally risky technologies, but in fact are willing to take measures which would allow them to make a more meaningful contribution. This would include self education and a willingness to engage in negotiated solutions.

#### 8.5 The **Wolfe Island Experience**

In the context of the Wolfe Island case study it would appear that Bell failed to **recognize** the benefits to be gained from incorporating the public's most abiding concerns into the decision making process. Rather than being open to discussion and **compromise** Bell maintained an inflexible position. This in turn resulted in a highly confrontational and antagonistic process.

As well, the uncompromising position of Bell on this matter would suggest that they have not placed enough emphasis on the level of uncertainty associated with

electromagnetic technologies. Rather, it would appear that they have **more-or-less** discounted any questions of doubt to the point where they have intimated that the only solution to the problem would be a favourable shift in public perceptions of risk.

Bell also indicated that they did not think the public could have been more meaningfully incorporated into the process, and that the public was not capable of making responsible decisions given the complexity of the issues. Finally, Bell strongly implied that they were not open to negotiation on their position and that any changes to the process would be of little value.

Bell's position on such matters is certainly different from the views expressed by the public. Whereas 55% of the public indicated that they may be wrong in their perceptions of the risk, Bell indicated 100% confidence in their positions. Similarly, whereas 27% of the public indicated that their positions were "unchangeable", all of the Bell officials indicated that their positions were not to be changed. Likewise, although the majority of the public indicated that they saw the process to be inherently confrontational, 32% indicated that there was room for negotiation among the different parties involved. Bell on the other hand seemed to accept that the process was inherently confrontational and had apparently resigned themselves to the "DAD"--decide, announce, defend--style of decision making.

These findings suggest that the adherence to expert opinion in the face of the associated uncertainty exacerbated the level of opposition. Had Bell engaged in a

more open and consensual approach, it is possible that the level of confrontation and opposition might have been minimized, and that the public might indeed have demonstrated a willingness and ability to engage constructively in a mutually beneficial decision making process.

## **9.0 RECOMMENDATIONS**

In looking at the results of the study a number of important considerations emerge:

- 1) Given the level of uncertainty associated with risky technologies the public should have a say in how much risk they are willing to accept. This means that public concerns must be incorporated into the decision making process involving environmentally risky technologies.
- 2) Changes should be made to the process which would allow for more public input and better communication between the different parties involved;
- 3) Changes to the process should include technical and financial assistance to help the public in dealing with the complexity of the issues;
- 4) The majority of the public (95%) has indicated that their inclination for self-education would increase if they were more meaningfully incorporated into the process. Therefore, government and corporate representatives should encourage this. One approach may be through the development of “neutral” educational materials.
- 5) Efforts should be made to minimize the confrontational nature of the process through the exploration of options and alternatives such as mediated and negotiated solutions.

However, the critical starting point is for decision makers (corporate and government) to **recognize** that the public has a legitimate role to play in environmentally risky decision making processes.

## APPENDIX A: THE QUESTIONNAIRE

### PART 1: PERCEPTION OF RISK

***Hello. My name is Jason Copas. I am a Master's student at Queen's University in the School Of Urban and Regional Planning. The survey I will be asking you to respond to shortly, is part Of a study I am conducting on risk perception and environmental decision making. The study, which will be submitted to the School as my Master's Report, chooses the construction of the Bell microwave tower on Wolfe Island, as a case study of risk perceptions in environmental decision making. The key objective of my study is to look at the question of public involvement in "risky" environmental projects--to assess whether or not such involvement is or is not warranted, and to what extent.***

***You are not obliged to answer any of my questions. Your answers are anonymous and strictly confidential. If you do not know an answer to a question, or if you have no opinion, please feel free to give this as you answer.***

1. Where do you live?

2. Where is this in relation to the Bell tower site?

Less than 100 metres. \_\_\_\_\_

In Marysville. \_\_\_\_\_

Elsewhere on Wolfe Island. \_\_\_\_\_

Somewhere other than Wolfe Island. \_\_\_\_\_

3A. Are you opposed to the citing of the Bell tower on Wolfe Island?

Yes. \_\_\_\_\_

No. \_\_\_\_\_

Indifferent. \_\_\_\_\_

3B. If yes, for what reason or reasons are you opposed to the project?

What would be your strongest reason for opposition?

3c. If no, for what reason or reasons do you support the project?

What would be your strongest reason for support?

3D. If indifferent, for what reason or reasons are you indifferent to the project?



4A. If risk is thought of as the severity of a given outcome (for example contracting cancer) multiplied by the probability of the outcome (usually expressed as a %) would you then perceive the tower to be a significant risk?

Yes. \_\_\_\_\_

No. \_\_\_\_\_

Indifferent. \_\_\_\_\_

4B. If yes, what exactly would be the nature of that risk?

5. Do you feel the building of the Bell tower could lead to an increased risk of cancer or any other disease amongst the local residents?

Yes. \_\_\_\_\_

No. \_\_\_\_\_

Don't know. \_\_\_\_\_

6. How likely is it that there will be significantly higher incidence of cancer (or any other reported microwave-linked disease) in the area upon completion of the project?

Much more likely. \_\_\_\_\_

Somewhat more likely. \_\_\_\_\_

Rather unlikely. \_\_\_\_\_

Very unlikely. \_\_\_\_\_

Don't know. \_\_\_\_\_

7. How likely do you think it would be that even 1 of the local residents would contract cancer (or any other reported microwave linked disease) as a direct result of the Bell tower?

Very likely. \_\_\_\_\_

Somewhat likely. \_\_\_\_\_

Rather unlikely. \_\_\_\_\_

Very unlikely. \_\_\_\_\_

Don't know. \_\_\_\_\_

8. In a letter to Bell from Health and Welfare Canada, the Federal department assured Bell that, “the exposure levels at ground level are more than many thousand times below the maximum level permitted in our safety code” and that “the type of installations in question do not pose any likelihood of exposure to radiofrequency radiation at the ground level even remotely considered hazardous.” How much confidence do such assurances give you as to the safety of the project?

Very much more confidence. \_\_\_\_\_  
Somewhat more confidence. \_\_\_\_\_  
Not much more confidence. \_\_\_\_\_  
No more confidence. \_\_\_\_\_  
Don't know. \_\_\_\_\_

- 9A. Government and many scientific experts deny any significant risks associated with this and similar projects. Would this in itself be enough to convince you that opposition to the project is unwarranted?

Yes. \_\_\_\_\_  
No. \_\_\_\_\_  
Don't know. \_\_\_\_\_

- 9B. If not, would you think that the perception of risk alone would be sufficient for someone to oppose the project?

Yes. \_\_\_\_\_  
No. \_\_\_\_\_  
Don't know. \_\_\_\_\_

10. Do you believe that your risk perceptions regarding the Bell tower are correct, or would you admit that they could be incorrect?

Correct. \_\_\_\_\_  
Possibly Incorrect. \_\_\_\_\_  
Unsure. \_\_\_\_\_

11. Suppose for a moment you have the ability to see into the future. Would it be necessary for the feared risk to be substantiated (e.g. by an incidence of cancer) for you to oppose the project, or would the perception of the risk regardless of the outcome be sufficient.

Substantiation necessary. \_\_\_\_\_  
Substantiation not necessary. \_\_\_\_\_

12A. Many experts feel that members of the general public often tend to either underestimate or overestimate the actual potential for harm from risky technologies. Do you agree with this assessment?

Yes. \_\_\_\_\_  
No. \_\_\_\_\_  
Don't know. \_\_\_\_\_

12B. Do you agree this is the case with respect to the Bell tower?

Yes. \_\_\_\_\_  
No. \_\_\_\_\_  
Don't know. \_\_\_\_\_

12C. If yes, is it underestimated or overestimated?

Underestimated. \_\_\_\_\_  
Overestimated. \_\_\_\_\_

13A. Would you accept or consider accepting the Bell tower if the community were to be offered compensation?

Yes. \_\_\_\_\_  
No. \_\_\_\_\_  
Don't know. \_\_\_\_\_

13B. If yes, what would you consider to be adequate compensation for the community?

14. **As** the Bell proposal easily meets the current federal regulatory guidelines, would you be open to considering some type of community funding of safety measures above and beyond the measures currently being taken?

Yes. \_\_\_\_\_  
No. \_\_\_\_\_  
Don't know. \_\_\_\_\_

15. Would you personally consider paying into such a fund?

Yes. \_\_\_\_\_  
No. \_\_\_\_\_  
Don't know. \_\_\_\_\_

16. Other than those currently provided for in the regulatory policy, what measures might you suggest for the financing of safer options?

**PART 2: PERCEPTION OF THE PROCESS**

Now the survey will change its focus from the general perceptions of risk to perceptions of the actual public process. In this case the process includes the meetings between Bell, the Wolfe Island Council, and concerned citizens. Please let me know how you feel about the process as it occurred on Wolfe Island.

17. In your own words, what was your role in the process?

18. In your opinion do you think the process needs changing?

Yes. \_\_\_\_\_

No. \_\_\_\_\_

Don't know. \_\_\_\_\_

19. What changes, if any, could you suggest to improve the process?

20. If you believe changes need to occur, where do you think they are most needed?  
(Please rank from 1 to 5, with 1 being where changes are most needed)

\*Please note: only rank those factors which you feel require changing.

Government regulations (i.e. tougher standards). \_\_\_\_\_

Corporate responsibility/sensitivity (i.e. consideration of safer, more expensive options). \_\_\_\_\_

Municipal opposition (i.e. more stringent building codes). \_\_\_\_\_

Citizen involvement/awareness (i.e. private information sessions). \_\_\_\_\_

Other. \_\_\_\_\_

21. Is your position with respect to the citing of the Bell tower unchangeable regardless of the opinion of the other actors (regulators, experts, Bell officials, municipal politicians, the general public)?

Yes. \_\_\_\_\_

No. \_\_\_\_\_

Don't know. \_\_\_\_\_

22A. Do you think the process can lend itself to a consensus building type of approach among government industry and the general public, or do you see it as being more inherently confrontational?

Consensual. \_\_\_\_\_

Confrontational. \_\_\_\_\_

Don't know. \_\_\_\_\_

22B. Do you feel that opposition to the project might have been altered had the process allowed for more public input?

Yes. \_\_\_\_\_

No. \_\_\_\_\_

Don't know. \_\_\_\_\_

22C. Do you feel that opposition to the project resulted from poor communication among the various actors?

Yes. \_\_\_\_\_

No. \_\_\_\_\_

Don't know. \_\_\_\_\_

23. Would a longer, more comprehensive process be of any value in reaching an optimal solution to the problem?

Yes. \_\_\_\_\_

No. \_\_\_\_\_

Don't know. \_\_\_\_\_

PART 3: INCORPORATION OF **THE** PUBLIC INTO THE PROCESS

Finally, the survey will examine ideas on the incorporation of the public into the process; the levels of support for (or opposition to) such an idea; and the question of how it might be accomplished. Again, I am interested in how you feel about the idea of public participation in the public meeting process as it occurred on Wolfe Island.

24A. In your opinion, do you think that the public has or has not been adequately incorporated into the public information process for projects such as the Bell tower on Wolfe Island?

Has been adequately incorporated. \_\_\_\_\_

Has not been adequately incorporated. \_\_\_\_\_

Don't know. \_\_\_\_\_

24B. If no, do you think the public could realistically be incorporated into the process in a meaningful way?

Yes. \_\_\_\_\_

No. \_\_\_\_\_

Don't know. \_\_\_\_\_

24C. What measures could you suggest to do so?

25. Do you believe that the public should be more tolerant, or more critical of government regulations, or is the current tension between the regulators and the public appropriate?

More tolerant. \_\_\_\_\_

More critical. \_\_\_\_\_

Appropriate. \_\_\_\_\_

Don't know. \_\_\_\_\_

26. Did you feel the process allowed critics and opponents to the project enough time to raise their concerns?

Yes. \_\_\_\_\_

No. \_\_\_\_\_

Don't know. \_\_\_\_\_

27. Does the process supply the resources (financial, technical, etc...) for them to do so?

Yes. \_\_\_\_\_

No. \_\_\_\_\_

Don't know. \_\_\_\_\_

28. If the public were to be more meaningfully incorporated into the process than in the past, do you think there would be a strong inclination for self education on environmental matters?

Yes. \_\_\_\_\_

No. \_\_\_\_\_

Don't know. \_\_\_\_\_

29. In your opinion, do you think the general public is both willing and able to make environmental decisions that are economically, scientifically, and socially responsible?

Yes. \_\_\_\_\_

No. \_\_\_\_\_

Don't know. \_\_\_\_\_

30. Which of these **characterizations** most applies to you?

\_\_\_\_\_ i) in that it is ultimately members of the general public who have to live with the risks of the Bell tower, it should be the general public who decides whether or not to accept the tower in their community.

\_\_\_\_\_ ii) in that the general public is not sufficiently versed in matters of microwave radiation, it should be up to regulators and experts alone to decide whether the tower should be built on Wolfe Island.

\_\_\_\_\_ iii) in that risk incorporates both technical (expert) and **socio/political** (public) considerations, the decision whether or not to construct the Bell tower should reflect a consensus between the two.

31. Do you have any other comments on either the general issue of risk, or the specific case of the Bell tower?

*I would like to thank you for taking the time to answer these questions. Should you have any further comments or concerns, I can be reached at 549-7885 or you can call Dr. Sue Hendler at the School of Urban and Regional Planning (545-2188).*



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