RESIDENTS' REAPPRAISAL OF A LANDFILL: A CASE STUDY IN STONEY CREEK, ONTARIO

RESIDENTS' REAPPRAISAL OF A LANDFILL:

A CASE STUDY IN STONEY CREEK, ONTARIO

BY

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A Thesis

Submitted to the School of Graduate Studies

in Partial Fulfillment of the Requirements

for the Degree

Master of Arts

McMaster University

MASTER OF ARTS (2006)
(Geography & Earth Sciences)

McMaster University
Hamilton, Ontario

TITLE:	Residents' Reappraisal of a Landfill: A Case Study in Stoney Creek, Ontario
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SUPERVISOR:	Dr. Susan J. Elliott
NUMBER OF PAGES:	xi, 251

ABSTRACT

This thesis discusses a longitudinal study of psychosocial effects in a population living within 2 kilometers of the Taro Aggregates Ltd. East Landfill site in Stoney Creek, Ontario. This facility has been the source of longstanding concerns among residents in the surrounding community. The focus of the study is local residents' reappraisal of the landfill over a nine-year period. The theoretical basis for the research lies in the fields of environmental stress and coping, place effects and risk perception. A telephone survey was administered to a random stratified (by distance) sample of households during the decision-making process (1996) and five years after the landfill site was constructed and began operation (2002). In-depth interviews were conducted with a sub-set of respondents in 2005 in order to better understand how people act in, and give meaning to, their own lives. The scope of this research is based on the need for additional comparative, as well as longitudinal, studies that measure how individuals and communities respond to the process of making the decision to site a landfill, and how these responses change over time as they live with the landfill. This work is part of an ongoing, multidisciplinary research program designed to determine the impacts of exposure to environmental stressors on human health and well-being and to develop strategies to reduce their adverse effects.

Residents' reappraisal of the Taro East Landfill site reveals little change in the frequency of landfill concerns over time, with over half the respondents maintaining concerns about the site in the post-siting process. There was a significant increase in the frequency of health concern, a shift in the nature of the health concern (short-term vs. long-term) and a reduced frequency of daily life effects (perceived/anticipated) and action-focused coping as residents lived with the landfill. While most used a variety of coping strategies to mitigate effects, emotion-focused strategies were used with greater frequency. The results reveal a range of factors that mediate residents' reappraisal of the landfill related to context (e.g., lack of meaningful involvement in the siting process, mismanagement, incidents), composition (e.g., socioeconomic status, dwelling tenure and type) and collective (e.g., distrust, inequity, stigma). These findings imply an ongoing process of reappraisal whereby, for many, latent concerns remain even though they have adapted to the landfill over time. The longitudinal nature of this study, the integration of quantitative and qualitative approaches, and the focus on factors affecting the reappraisal of an environmental stressor, are the primary contributions of this research.

ACKNOWLEDGEMENTS

First and foremost, I would like to gratefully acknowledge the guidance and contributions of Susan Elliott as my supervisor throughout all phases of this thesis. This has truly been an experience of a lifetime! To my other committee members, Rob and Bruce, I am thankful for your time and invaluable feedback.

Also, I would like to thank Kerry, Tracy, Dan, Sophie, Anneliese, Michelle, Dora, Rhonda and Gen for their wisdom, advice and words of motivation throughout the course of this work (Sorry if I have left anyone out!). I must also acknowledge the never-ending praise and encouragement from my family (Sousa and McClure), as well as my best friends, Lynds and Jo.

This thesis is dedicated to my parents, David and Deborah Sousa, and fiancé William for their continuous support, love and faith in me.

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CHAPTER 1: INTRODUCTION

This thesis seeks to understand an environment and health relationship by addressing psychosocial impacts in a population living near a solid waste industrial disposal facility in Stoney Creek, Ontario. Psychosocial impacts are defined as:

> "The complex of distress, dysfunction and disability, manifested in a wide range of psychological, social and behavioural outcomes in individuals, groups and communities, as a consequence of actual *or perceived* environmental contamination" (Elliott et al. 1993: 791).

The focus of the study is local residents' reappraisal of the landfill over a nine-year period. A telephone survey was administered to a random stratified (by distance) sample of households during the decision-making process (1996) and five years after the landfill site was constructed and began operation (2002). In-depth interviews were conducted with a sub-set of respondents in 2005. The scope of this research is based on the need for additional comparative, as well as longitudinal, studies that measure how individuals and communities respond to the process of making the decision to site a landfill, and how these responses (experience and attitudes) change over time. This work is part of an ongoing, multidisciplinary research program designed to determine the impacts of exposure

to environmental stressors on human health and well-being and to develop strategies to reduce their adverse effects.

1.1 Research Context and Rationale

Locating waste disposal facilities is a growing public policy problem, and there is increased pressure to locate new facilities as older sites reach their capacity. Research has often shown these efforts to pose important challenges for many communities in Canada (e.g., Taylor et al. 1991; Elliott et al. 1993; 1997; Dunn et al. 1994; Munton 1996; Baxter 1997; Baxter et al. 1999; Wakefield & Elliott 2000; Baxter & Lee 2004; Baxter & Greenlaw 2005). Members of local communities are frequently opposed to waste disposal facilities in 'their own back yards' due to concern, anxiety and uncertainty over the possible health, nuisance and property value effects of waste disposal activities (Hadden 1991; Portney 1991; Taylor et al. 1991; Ziess 1991; Kunreuther et al. 1993; Lober 1993; Petts 1995; Wolsink 1994; Munton 1996). Opposition is particularly high in some communities due to the occurrence of publicized events like Love Canal (Levine 1982; Levine & Stone 1986) and, local situations, such as the Upper Ottawa Street Landfill Site in Hamilton (Hertzman et al. 1987). This opposition has been reinforced by the transition from an industrial to a risk society in the last few decades (Giddens 1990; 1991; Beck 1992a; 1992b).

Existing research has shown the level of concern in populations living near a facility to vary widely depending on whether the facility: (1) already exists

or has been recently approved (Elliott et al. 1993; 1997; Elliott & Taylor 1996; Elliott 1998); (2) is merely proposed (Baxter et al. 1999; Wakefield & Elliott 2000); or, (3) provides recognizable local benefits (Dunlap et al. 1993; Baxter & Lee 2004). In particular, studies have shown higher levels of psychosocial effects in populations exposed to approved (opposed to existing) waste disposal facilities, indicating perhaps that psychosocial effects were more a result of anticipatory anxiety than actual impacts (Hadden 1991; Elliott et al. 1993; 1997; Elliott & Taylor 1996; Elliott 1998; Wakefield & Elliott 2000). In the language of environmental stress and coping theory (Lazarus & Folkman 1984), the environmental stressor to which individuals are responding may be the siting process. This finding is not surprising in light of the fact that the siting process may last as long as the landfill itself and may be explained by uncertainty (about the future, about potential impacts on health and/or property values).

While there is some indication that negative perceptions and concerns decrease as residents live with a landfill, a weak attempt has been made to effectively document changes in psychosocial effects and reappraisal of waste disposal facilities, as well as the dynamic processes (i.e., mediating factors) that underlie these changes. The psychosocial literature related to siting waste disposal facilities only includes one known study that examines residents' reactions before and after the siting of a landfill (i.e., pre- and post-siting processes) (Elliott et al. 1997). The remainder of the psychosocial literature related to siting waste disposal facilities is dominated by single cross-sectional or parallel case studies.

These studies are unable to investigate the reappraisal process, and so the need for additional longitudinal studies has been increasingly recognized (See Lazarus 1993; Elliott & Taylor 1996; Elliott et al. 1997). Additional longitudinal studies "...are needed to understand how relationships between awareness, concern, action and the site evolve over time" (Ostry et al. 1993: 3). This depth of understanding will be useful for making informed decisions about managing these facilities and for siting future facilities.

The value of this research is further increased by the absence of comparative studies. The longitudinal study conducted by Elliott et al (1997) in Milton, Ontario indicated that while a proportion of the population continued to dislike the site, psychosocial effects generally decreased as residents lived with the landfill. The findings imply an ongoing process of reappraisal due to the non-realization of anticipatory fears and the shift from an unknown landfill to a widely acknowledged state-of-the-art facility. While this substantiates in part previous suggestions of the role of uncertainty about future effects on health and property values in reporting psychosocial effects, the community context of Stoney Creek is quite different from that of Milton providing a unique opportunity to examine if the outcomes are also different. Knowing what factors shape such views will be important for developing effective siting and management strategies to make facilities safe and accepted.

Finally, while reactions from host communities living with recently approved or already existing sites have received considerable attention in the

psychosocial literature, much less has been studied in the context of proposed landfills (i.e., there are no longitudinal accounts) (Baxter et al. 1999; Wakefield & Elliott 2000). This is the time of greatest uncertainty in the siting process because residents are unsure if they will be hosting a waste disposal facility in their community.

1.2 Research Agenda

In the context of these emerging issues, the overall intent of this research is to examine how a community responds to the process of siting a landfill *during* the decision-making stage, and how these responses change over time as residents live with the landfill. The findings of this study are based on the analysis of longitudinal data from residents living within 2 kilometers of the Taro Aggregates Ltd. East Landfill site in Stoney Creek, Ontario. Specifically, this thesis is organized around three main research objectives:

> *1. To examine residents' reappraisal of a solid waste disposal facility;*
>
> *2. To explore the role of mediating factors in the reappraisal process; and,*
>
> *3. To integrate quantitative and qualitative approaches to the research question.*

The specific research objectives stem from the key recommendations of previous studies (See Baxter 1992; Elliott 1992; Dunn 1993; Elliott & Baxter 1994; Wakefield 1998). First, this work has recognized the need for longitudinal studies

to account for how the impacts of exposure to environmental stressors evolve as residents live with a waste disposal facility in their community. In this regard, new evidence on the factors affecting the reappraisal process is needed to develop strategies to reduce their adverse effects. Finally, research has shown that environment and health relationships are most usefully addressed through mixed-method approaches because it allows for a more comprehensive study and investigation of a wider range of phenomena (Elliott & Baxter 1994; Wakefield 2002). This study will follow a similar protocol, drawing on qualitative in-depth interviews to inform the interpretation of quantitative survey data.

1.3 Theoretical Orientation

An investigation of this kind is situated broadly within geographies of health research. However, the underlying conceptual framework emphasizes the social construction of knowledge to understanding issues of risk (Berger & Luckman 1966; Edelstein 1988; Gatrell 2002). The theoretical basis for this study lies in the fields of environmental stress and coping (Pearlin & Schooler 1978; Evans 1982; Lazarus & Folkman 1984), place effects (Macintyre 1997b; Macintyre et al. 2002) and risk perception (Douglas and Wildavsky 1982; Slovic 1987; Giddens 1990; 1991; Beck 1992a; 1992b; Renn & Rohrmann 2000; Slovic 2000) all of which share a focus in environment and health relationships.

First, Lazarus and Folkman's (1984) environmental stress and coping theory provides a useful framework to help understand the process of perceiving

and coping with an environmental stressor (e.g., waste disposal facility) over time. Their psychological model divides response to an environmental stressor into two stages: (1) **primary appraisal** whereby the individual appraises an environmental stressor as a threat, harm or challenge; and, (2) **secondary appraisal** whereby one of two coping strategies is selected, (i) problem focused coping (e.g., joining a citizen's action group) or, (ii) emotion-focused coping (e.g., denial). **Reappraisal** occurs as the perception of the stressor or available coping resources changes over time. The role of the reappraisal process in environmental stress theory underscores the need for longitudinal analyses such as this study of residents' responses to the Taro Aggregates Ltd. East Landfill site in Stoney Creek, Ontario.

Second, Macintyre and colleagues (2002) provide a useful theoretical framework to help understand the influence of the local environment on the reappraisal process. This framework underscores the important role place has in determining health and well-being. Macintyre (1997b) suggests three types of explanation for geographical variations in health and well-being: contextual (i.e., characteristics of the community, local physical environments), compositional (i.e., characteristics of the individual) and collective (i.e., values, ways of life, worldviews). This framework helps explain why waste disposal facilities invoke great concern in some groups and little concern in others, and at different stages of the siting process.

Finally, the risk perception literature informs an analysis of the factors influencing the reappraisal process. The study of risk perception has been informed by a variety of disciplines and frameworks (Lupton 1999). Within health geography, the study of risk perception incorporates both realist and constructivist approaches. Realist approaches to risk have identified a 'taxonomy' by which hazards are categorized and dealt with cognitively; that is, lay people over-estimate risks that are thought to be uncontrollable, involuntary or represent dread, to name a few (Heimer 1988; Hansson 1989; Johnson & Chen 1995; Slovic 2000; Renn & Rohrmann 2000). Constructivist approaches, however, suggest that risk is socially and culturally constructed; that is, risk perception is not just a matter of sensory perception but is influenced by the characteristics of the individual evaluating the risk (e.g., their values and expectations) and the context in which the risk is evaluated (Douglas and Wildavsky 1982; Beck 1992a; 1992b; Giddens 1990; 1991; Sjoberg 2000). Overall, the emerging theories of risk perception contribute additional insight to our understanding of the factors affecting the reappraisal process.

1.4 Contributions of this Research

The contributions of this research are three fold: theoretical, substantive and methodological. There are at least three theoretical contributions of this work. First, it builds on the environmental stress and coping theory with respect to the factors that mediate the experience of environmental stress as well as coping

responses. Second, it advances our understanding of the role of place in shaping people's health and experience by adequately conceptualizing, operationalizing and measuring the influence of context, composition and collective on the process of reappraisal. Third, it builds on the existing psychosocial literature by addressing changes in effects and reappraisal over time, an area that has received far less attention.

In terms of substantive contributions, this thesis is a departure from the previous research because it offers the opportunity to examine how a community responds to the process of siting a landfill *during* the decision-making stage (i.e., when uncertainty is at a peak), and how these responses change over time as residents live with the facility. These data will therefore provide a point on the continuum prior to the first point offered currently by the Milton study (i.e., immediately after the site had been approved). Further, the findings of this research suggest that negative perceptions and concerns do not necessarily significantly decrease as residents live with a landfill over time, thus challenging what others have suggested (Elliott et al. 1993; 1997; Elliott & Taylor 1996; Elliott 1998). This was explained by an increase in the frequency of respondents reporting health concerns over time, as well as a shift in the nature of the health concern reported (short-term vs. long-term). Further, the focus on factors affecting reappraisal has practical and policy significance for ongoing efforts to develop strategies for the reduction of psychosocial effects related to the location of environmentally sensitive land uses. This study recommends that it is

important to involve the public, engender trust, ensure equity and adequately deal with threats to ways of life and core values of the community when attempting to site a landfill with the least amount of conflict. While the pre-siting process for waste disposal facilities often includes a number of opportunities for expressing community views, it is essential that the host community has the opportunity to truly influence the siting process (i.e., a proactive public) and that these meaningful opportunities continue once a facility is operational. Further, the ability of the operator and authorities to manage and monitor the operation of a facility is also an important practice for competent siting.

Lastly, a methodological contribution is offered by the integration of quantitative and qualitative methods. This research provides an example of the effective use of a mixed-method research design where in-depth interviews are used to inform the interpretation of survey results (Greene et al. 1989; Morgan 1998). More specifically, the qualitative interviews provided additional insight into how people act in and give meaning to their own lives; an understanding that could not have been achieved through quantitative methods alone. By using a mixed-method approach the scope of the investigation was widened, and a more comprehensive study of residents' reappraisal of a solid waste disposal facility was conducted.

1.5 Chapter Outline

This thesis is organized into six chapters. Chapter two reviews the relevant theoretical, substantive and methodological literatures informing an investigation of the research objectives. First, the study is situated within the broader geographies of health research. This is followed by reviews of specific areas of theory, mainly Lazarus & Folkman's (1984) environmental stress and coping theory and Macintyre et al's (2002) place effects theory.

Chapter three describes the research design of the study, addressing both the quantitative and qualitative research approaches employed. This includes a discussion of the sample design, data collection methods and survey instruments used for each component of the research.

The legislative, community and site contexts within which this thesis takes place are described in chapter four. First, the legislative framework of the Environmental Assessment (EA) process in Ontario (as it existed before the legislative changes in 1997) is outlined. An overview of the EA process in which the landfill siting process operated is important to the timing of this research. Next, the Stoney Creek community under study is profiled. This profile includes a brief discussion of the community in terms of location, administration, population, site-related interest groups and media. Finally, the Taro Aggregates Ltd. East Landfill site context is discussed, including the history of the landfill site and the site's proponents.

This is followed by Chapter five in which the analysis and findings of the survey data and in-depth interviews are documented. The analytical approach was consistent with the constructs related to reappraisal derived from the environmental stress and coping theory and measured by indicators in the baseline and follow-up surveys. In-depth interview analysis provides an interpretive resource for understanding the quantitative results. Finally, bivariate and logistic regression analysis of the survey data was used to understand the characteristics of respondents more likely to report psychosocial impacts and take action in response to impacts.

The sixth, and final, chapter summarizes the key findings of this research and discusses the primary theoretical, substantive and methodological contributions of the research. The implications for future policy and areas for future research are also highlighted in this chapter.

CHAPTER 2: REVIEW OF LITERATURE

As stated in the previous chapter, the objectives of this thesis are:

1. To examine residents' reappraisal of a solid waste disposal facility;

2. To explore the role of mediating factors in the reappraisal process; and,

3. To integrate quantitative and qualitative approaches to the research question.

This chapter reviews the relevant theoretical, substantive and methodological literatures informing this research. In so doing a number of gaps are highlighted. The theoretical frameworks that inform this research include: Lazarus and Folkman's (1984) two-stage environmental stress and coping model and Macintyre et al's (2002) context, composition and collective framework. The risk perception literature informs an analysis of the factors contributing to reappraisal. This is followed by a discussion of the empirical evidence surrounding the impacts of exposure to waste disposal facilities. In terms of methodological literature, this research utilizes an integrated quantitative and qualitative approach in an effort to 'know more' about residents' reappraisal of a landfill site when conducting geographies of health research (Greene & Caracelli 1997; Taskakkori & Teddie 1998; Morgan 1998).

First, this chapter is prefaced by a brief discussion that sets the geographic context for assessing changes in psychosocial effects and reappraisal over time. As does Edelstein (1988: 43), this thesis privileges the notion of perception in the context of environmental risks.

2.1 Setting the Stage

The assessment of changes in psychosocial effects and reappraisal of an environmental stressor over time is situated broadly within geographies of health research. According to Elliott (1999), the current role of geographers in health research has been the consequence of three fundamental shifts in thinking: the changing definition of health; the growing importance of the population health approach; and, the shift from medical to health geography.

2.1.1 The Concept of Health and the Population Health Approach

The notion of health has evolved since its original conception, from merely 'the presence or absence of disease' to 'a state of complete physical, mental and social well-being' (World Health Organization 1957; 1986). Concomitant with this shift in the definitions of health is a shift in the models used to understand how health and well-being are shaped. Traditionally, a biomedical model was used to frame health and well-being, where the restoration of health was the sole responsibility of the physician (White 1981; Evans & Stoddart 1990; Rootman & Raeburn 1994). Based on this simple feedback model

(Figure 2.1), the health care system is the only form of public policy which might lead towards the objective of health (Evans & Stoddart 1990). People got sick for a variety of unspecified reasons and the level of response was dependent on one's access to health care (Evans & Stoddart 1990). For example, it is assumed by the biomedical model that disease is a deviation from 'normal' biomedical functioning. Each disease is caused through a specific, generic pathogenic agent, microorganism or disease vector that can be cured or cared for by medical treatment.

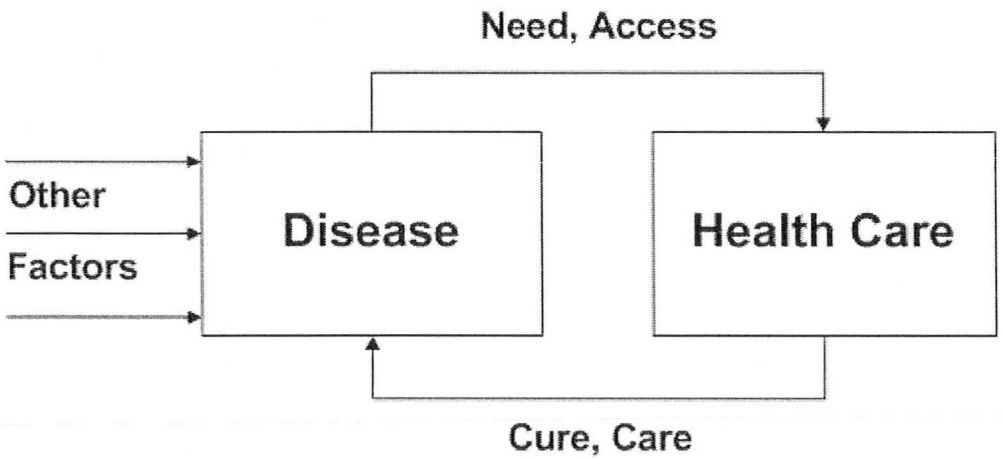

FIGURE 2.1 – Biomedical Model of Health
(Source: Evans & Stoddart 1990)

Advancements in research, however, made it increasingly clear that there was a need for developing new ways of framing our understanding of the health of populations (Evans & Stoddart 1990). The population health perspective reflects a shift in thinking about how health is defined emphasizing not only

multiple determinants (medical and non-medical) of health but the role of the social, cultural and physical environments, as well as the social and emotional properties of health (White 1981; Evans & Stoddart, 1990; CIAR 1993b; Frank 1994). Although not without critics (Hayes et al. 1994; Guidotti 1997; Hayes & Dunn 1998), this model was seen as a breakthrough and became the guiding framework for research and policy within the areas of population health and health promotion (Federal, Provincial, & Territorial Advisory Committee on Population Health 1994; Health Canada 2002; Elliott et al. 2000). A line-and-box diagram was used to sum up Evans and Stoddart's (1990) understanding of the determinants of health (Figure 2.2). This framework is unique because it shows potential interactions between factors and the ways in which they connect and mediate relationships with other outcomes.

The recognition of broadening definitions of health and rise of the population health approach reflects the increased attention that has been paid to psychosocial health research over the past several years (opposed to a focus primarily on the possible physical effects of exposure in the past), particularly the effects of exposure to waste disposal facilities (WHO 1957; Health Canada 1986). As this chapter will demonstrate, a substantial number of mediating factors influence residents' experience of, and response to, an environmental stressor within the context of their everyday lives.

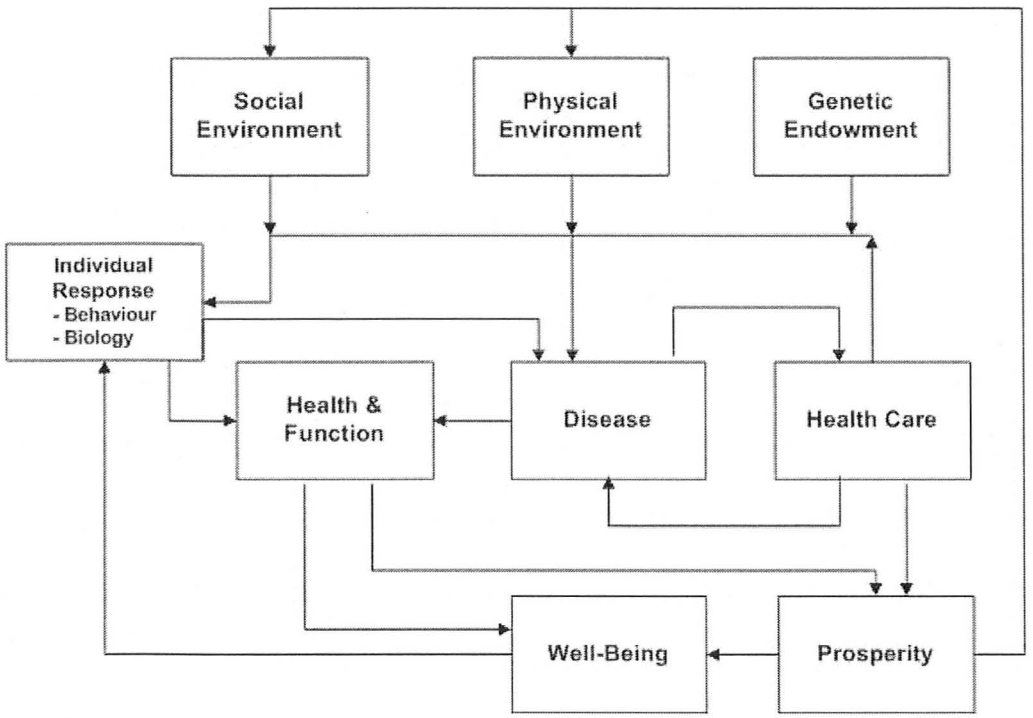

FIGURE 2.2 – Conceptual Framework for the Determinants of Health (Source: Evans & Stoddart 1990)

2.1.2 From Medical to Health Geography

The shift from medical to health geography has been well documented in the geographies of health literature (Curtis & Taket 1996; Rosenburg 1998; Gatrell 2002; Kearns & Moon 2002). As the models and definitions of health have evolved, so have the approaches and strategies within the geographies of health. There has been a shift in perspectives from a positivist/quantitative standpoint to a more interpretive/qualitative standpoint. While this research makes use of the positivist perspective by employing quantitative data collection methods,

specifically this thesis is located within the interpretive spheres of health geography where the goal is to understand the meanings people attach to place.

Traditional inquiry in the geographies of health was dominated by positivist approaches, where the focus is on objectivity, the observable, the measurable and the generalizable. This approach is derived from the traditional biomedical model described previously. The concern in positivist approaches is the location, spatial arrangement (i.e., mapping) and determinants of health outcomes (i.e., disease incidence), health centers (i.e., accessibility) or health workers (i.e., supply and use). Individual data through the use of questionnaires (i.e., quantitative methods) is used to form causal relationships under the positive perspective. The use of a large-scale survey provides a great breadth of information in a relatively short period of time and has been suggested as a useful methodologic tool in the documentation of psychosocial effects of the landfill siting process (Kraft 1993).

Other researchers adopt social interactionist approaches where the subjective, 'lived-experience' of health and illness in particular places is explored and interpreted (i.e., qualitative methods). Social interactionist approaches to the geographies of health are a reflection of the broadening definitions of health. Some researchers refer to this approach as social constructionist (e.g., Berger & Luckman 1966). Berger and Luckman (1966) argue that meanings are constructed out of the interactions that individuals have with each other in day-to-day life through conversations, encounters and social interactions. The social construction

of knowledge aids in the understanding of how assessments are made about the nature of risk; that is, the importance of the 'shared experience' when living in close proximity to an industrial waste disposal facility in this instance. This perspective is also referred to as humanistic, whereby human values, beliefs, intentions and meanings construct health and illness (Curtis & Tacket 1996). The role of geographers involves interpreting the construction of knowledge about health from people. For example, a social interactionist perspective has been used to explain the social world where individuals experience symptoms and there is no exposure (i.e., the notion of perception) (Edelstein 1988).

A third approach to the geographies of health is termed structuralist. Here the focus is on the broader social context of health. That is, the social, political and economic macro-scale structures that determine health (and the provision of health care). This approach is also referred to as a political economy perspective and is identified with Marxist theories where inequalities are embedded in the larger societal system (i.e. not interested in the individual voice or choice) (Gatrell 2002). According to a structuralist approach, if one is exposed to an environmental stressor they are more likely to get sick; one is more likely to get sick if they are poor; industries build where land is cheap; near the poor. Thus, society has an important role in determining health.

Structuration, most closely identified with the social theorist Anthony Giddens (1990; 1991), acknowledges that both structure *and* human agency influence health. That is, not only do structures shape social actions and practices,

but actions and practices also shape social structures. In the context of siting waste disposal facilities, through physical, political, economic and cultural structures, forces arise and determine the actions taken by the actors (e.g., industry, government, community), which in turn affect the siting process either directly or indirectly.

Finally, post-structuralist approaches to the geographies of health are concerned with how knowledge and experience are constructed in the context of power relations. This includes research that has been conducted on risk (Beck 1992a; 1992b). That is, society is more concerned with risks that are considered uncontrollable and invisible. This includes risks that are controlled by experts and decision-makers such as a landfill, since this questions the trustworthiness of these institutions and organizations (e.g., Wakefield & Elliott 2000).

Overall, the shift from medical to health geography parallels emerging literature that highlights the importance of 'place', as opposed to space, on health more generally (Kearns 1993; Kearns & Gesler 1998; Macintyre et al. 2002). Geographically speaking, space is based on some kind of administrative or physical boundary, while place takes account of the meaning of that particular area for a particular individual, or group of people (Dyck 1999; Gatrell 2002). This conception of place points to the relationship between an individual's place in the world and experience of place as a valid way of knowing (Dyck 1999). In the context of siting waste disposal facilities, previous research suggests that the experience of psychosocial impacts cannot be divorced from the local

environment within which they occur (White 1981; Buttel 1987; Edelstein 1988; Elliott et al. 1997; Elliott 1998). That is, the particular circumstances associated with a specific facility are to some degree unique (e.g., individual characteristics, core values, worldviews, ways of life, social networks, landfill-related factors), underscoring the important role place has in influencing Stoney Creek residents' reappraisal of the Taro Aggregates Ltd. East Landfill site over time.

2.2 Putting Research into Context

The most useful theoretical framework for studying the reappraisal process is Lazarus and Folkman's (1984) environmental stress and coping theory. Macintyre et al's (2002) context, composition and collective framework inform our understanding of the factors that influence the reappraisal process. The characteristics of context, composition and collective influence the perception of an environmental stressor and available coping strategies that can be employed to deal with the stressor. Although each distinct theoretical framework has drawn much attention in the literature (e.g. Crighton et al. 2003; Luginaah 2002; Shaw et al. 2002; Macintyre et al. 1993) the nature of this relationship is a fundamental limitation of past research (Picket & Pearl 2001; Davey Smith et al. 1995; Sloggett & Joshi 1994; Duncan et al. 1993). Therefore, this research will attempt to integrate the theoretical frameworks and provide a conceptual lens through which our understanding of place, through its application to the reappraisal process, is enhanced.

2.2.1 Contextualizing Environmental Stress and Coping Theory

Lazarus and Folkman's (1984) psychological model of response to an environmental stressor explains an individual-level response to an environmental stressor (e.g., solid waste facility) as an iterative process (Lazarus 1966; Pearlin & Schooler 1978; Evans 1982; Baum 1982; Cohen et al. 1986). Appraisal is divided into two stages: (1) **primary appraisal** and, (2) **secondary appraisal**. Primary appraisal involves the individual's perception of the environmental stressor. The individual evaluates the stressor as a threat, harm or challenge. One's perception of the environmental stressor determines the impact of stress. Evans and Cohen (1987: 573) define stress as "a process that occurs when there is an imbalance between demands and response capabilities of the organism." An individual's primary appraisal of the stressor is influenced by the characteristics, conditions and context of the stressor (Taylor et al. 1991). Secondary appraisal involves the evaluation of the coping resources and strategies available to deal with a stressor. Coping consists of both cognitive and behavioral efforts to manage psychological stress. Lazarus and Folkman (1984) categorize these efforts into two major forms: (i) *problem-focused coping* and, (ii) *emotion-focused coping*. Problem-focused coping is when actions are taken to remove or mitigate the effects of the stressor. That is, changing the troubled person-environment relationship by acting on the environment or one's self (e.g., joining a citizen's action group, complaints to industry or government officials) (Folkman & Lazarus 1990). Emotion-focused coping involves regulating emotional responses to the problem. On the one hand,

this could entail changing the way the stressful situation is attended (e.g., avoidance or wishful thinking) (Folkman & Lazarus 1990). On the other hand, it could mean changing the relational meaning of what is happening so stress is mitigated even though the actual conditions have not changed (e.g., denial or distancing) (Folkman & Lazarus 1990). While denial is not always seen as a healthy response, in this context an appraisal has been made that eliminates the threat and stressful condition. Coping, therefore, mediates the emotional outcome as well (e.g., Folkman & Lazarus 1988; Bolger 1990). When stressful conditions are viewed as difficult to change or uncontrollable Lazarus and Folkman (1980; 1987) suggest emotion-focused coping predominates. Conversely, problem-focused coping predominates when stressful events are viewed as controllable by actions (Lazarus & Folkman 1980; 1987).

Lazarus and Folkman (1984) define this theoretical framework as an ongoing process whereby the perception of the environmental stressor or available coping resources change with context and over time; this is termed **reappraisal**. However, an approach that does not supplement contextual measurement is too limited and weak according to Lazarus (1993), but instead the process measures of environmental stress and coping must be placed within the larger structure of a person's life and ways of relating to the world. As we will see in the next section, contextual, together with compositional (i.e., characteristics of the individual) and collective (i.e., values, norms, nature of the social relationships within a

community) factors have an important influence on the reappraisal of an environmental stressor (Macintyre et al. 2002).

2.2.2 Explaining Place Effects

The importance of the meanings and experiences of place to health and wellbeing is also captured within Macintyre and colleagues (2002) conceptual framework of context, composition and collective. **Contextual, compositional and collective** are offered as three types of explanation, alone and in combination, for geographical variations in health. Contextual explanations include local physical features of the environment shared by all residents in a locality, as well as characteristics of the community and/or neighborhood (e.g., the quality of air and water, environmental threats) (Macintyre et al. 1993; Cummins & Macintyre 1999; Sooman et al. 1993). Compositional explanations include the characteristics of individuals that live in these places (e.g., socio-economic status, education) (Sloggett & Joshi 1994; Duncan et al. 1993; Shaw et al. 2002). Collective explanations include the values, beliefs, worldviews and social relations of the particular community (e.g., trust, equity, networks of community support, stigma) (Macintyre et al. 1997b; Macintyre & Ellaway 1998; 1999; 2000b; Lynch et al. 2000b; Gatrell 2002).

While categorized as independent, Macintyre et al (2002) emphasize the inter-dependency and inter-relatedness of context, composition and collective. For example, Macintyre et al (2002) offer three explanations for why children in

deprived areas may not play in open air. A compositional based explanation would be that their families do not have a garden or the resources to take them to play at parks. A contextual explanation would be that there are too few public parks provided or they do not have adequate access to them. Lastly, a collective explanation would be that it is not considered safe for children to play in public places with strangers, or that culturally playing is not seen as something important. The authors suggest that focusing on one factor to the exclusion of the others is counter-productive, and will ultimately lead to a biased explanation. This form of conceptual thinking about place offered by Macintyre et al (2002) is useful in understanding the relationship between local environments and human health, like the Stoney Creek case study, because it allows for a more holistic understanding of the processes that influence primary and secondary appraisal, and reappraisal. This is an area that has lacked attention in the literature (Ellaway & Macintyre 1998; Ellaway et al. 2001; Wilson et al. 2004).

Despite this reasoning, some researchers claim these factors to be mutually exclusive (Sloggett & Joshi 1994; 1998; Davey Smith et al. 1995; McCulloch 2001). One factor's importance over another has been highly debated in the literature. For example, a paper published by Sloggett and Joshi (1994) concluded that it is important to focus on compositional properties of the resident population (i.e., the people) when developing health policy. Similarly, Davey Smith and colleagues (1995) argued that mortality differences between people in the West of Scotland and the civil service in London, England, were not because

of differences between these two areas, but because of difference in the distribution of deprivation among individuals. In contrast, studies by Waitzman and Smith (1998) and Diez-Rouz and colleagues (1997) found geographical variations that cannot be explained by individual factors alone. For example, Waitzman and Smith (1998) found mortality risk to be higher for adults living in poverty areas in the United States after controlling for individual characteristics such as household income, race, marital status, to name a few. Similarly, Diez-Roux and colleagues (1997) found that neighbourhood characteristics in four US communities predicted coronary heart disease prevalence and risk factors after controlling for individual socioeconomic characteristics (education, occupation, income and house value). With this said, studies have also concluded that both contextual and compositional factors contribute significantly to health. A study conducted by Mitchell et al (2000) found a person's attitude towards their community (contextual), age and employment status (compositional) explained for differences in health. Still, the overall conception among researchers is where you live matters for health, although probably not as much as whom you are (Picket & Pearl 2001).

It is for this reason that Macintyre et al (2002) claim a lack of adequate conceptualization, operationalization and measurement of place effects. They argue that the relationships between context, composition and collective are not as straightforward as the literature suggests. Instead, weak theoretical accounts of how and why the characteristics of place might influence the health of its resident

population dominate the research in this area (Macintyre et al. 1993; 2002). Three suggestions are offered for improvement: (1) conceptualize place as a term encompassing a number of specific variables or characteristics; (2) combine contextual, compositional and collective factors when studying the impact of place on health; and, (3) study place effects on health in a longitudinal manner in order to take into account changes over time. This thesis attempts to fill these gaps in the literature by: (1) integrating the theoretical frameworks offered by Macintyre et al (2002) and Lazarus and Folkman (1984) to provide a conceptual lens through which to better understand the influence the local environment has on the experience of stress as well as the coping response (Figure 2.3); (2) investigating how changes in context, composition and collective factors, alone and in combination, influence residents' reappraisal of a waste disposal facility; and, (3) employing a longitudinal study design that integrates quantitative and qualitative techniques in order to effectively understand changes in reappraisal over time (See Section 2.5). This need to better understand the components of the local environment that affect individual and community wellbeing is further informed by the risk perception literature.

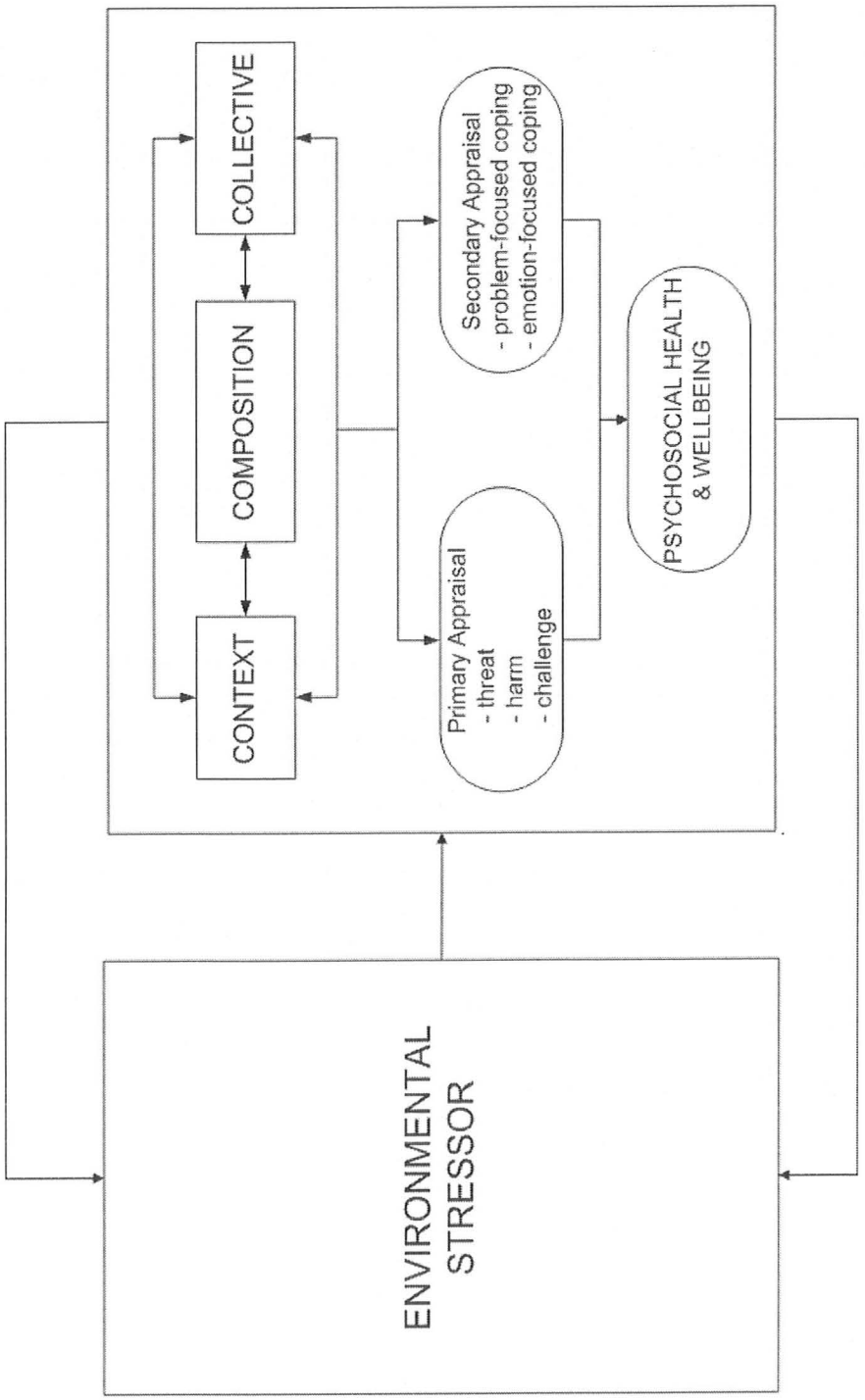

Figure 2.3 - Conceptual Framework
(Source: Lazarus & Folkman 1984; Macintyre et al. 2002)

2.3 Theorizing Risk

This section reviews some of the areas of environmental risk research which may be useful for understanding the findings in the present study. Lupton (1999) outlines two broad epistemological positions to understanding the ways groups of people conceive risk: realist and constructivist. Lupton (1999) conceptualizes this understanding through a risk continuum model where the realist approach places an emphasis on the objective character of risk that can be mapped and measured by knowledgeable experts independently of social and cultural processes. In contrast, the constructivist approach focuses on the social, cultural and political contexts in which risk is understood and negotiated. As previously discussed, this thesis is primarily situated within the interpretive sphere of health geography; however, both realist and constructivist positions inform an analysis of the factors contributing to reappraisal.

A realist approach to risk combines the notion of hazard with calculations of probability. Proponents of this approach are primarily focused on using psychological models to identify the cognitive and attitudinal processes through which risks are understood and represented at the individual-level. Although not without critics (e.g., Douglas 1992), a number of researchers have identified a 'taxonomy' by which hazards are categorized and dealt with cognitively (Lichtenstein et al. 1978; Slovic et al. 1982; Douglas 1985; Slovic 1987; 1999; Heimer 1988; Hansson 1989; Johnson & Chen 1995; Renn & Rohrmann 2000). Lay people tend to over-estimate risks that are thought to be uncontrollable,

involuntary, have delayed or latent effects, are unknown to those exposed (unfamiliar), have been initiated from an untrustworthy source of information, have received a high level of media attention and represent dread. Further, the work of Hadden (1991) suggests that the lay public trusts process rather than evidence (the latter being highly valued by the scientific community). Hadden (1991: 50) concluded, "...if people accept the ways in which decisions are made, they will accept the decisions themselves...". In the case of siting environmentally sensitive land uses (e.g., waste disposal facilities), many of these attributes have the potential to influence the process of reappraisal; e.g., the concern about future effects on health and property values, and the involuntary nature of the siting process, to name a few (e.g., Elliott et al. 1997; Luginaah et al. 2000; 2002).

Critics of the realist approach argue that while the approach offers considerable breadth it may lack some depth. There is agreement that the concepts and definitions reduce the meanings and behaviours associated with risk perception to the individual-level, and do not take into account the symbolic meanings created through the social world or the cultural and political aspects that mediate judgment, construct beliefs and behaviours (Lupton 1999; Sjoberg 2000). The only variables considered are characteristics of the hazard with little consideration of the people who evaluate them (i.e., beyond sociodemographics). While characteristics of the hazard provide indications of peoples' potential reactions, it is important to consider the perceived risks of hazards in the context

of everyday life to ensure that all the influences on risk perception are considered. This conception guides the research at Stoney Creek.

The constructivist approach to risk recognizes risk at the group- *and* individual-level, that risk is value-laden not value free and assumes that risk perceptions are socially and culturally constructed. In particular, this approach shifts attention to the social, political and cultural contexts within which perceptions of risk are formed. Three major constructivist perspectives on risk have emerged since the early 1980s: cultural/symbolic; risk society; and, governmentality (Lutpon 1999).

A cultural/symbolic perspective was first offered by Douglas (1969) and adopts a cultural anthropological approach. Douglas sees risk as a socially constructed interpretation and response to 'real' danger that objectively exists, even if knowledge about it can only ever be mediated through sociocultural processes. Much of Douglas's work on risk seeks to explain why some hazards are labeled as risky and others are not. For instance, according to Douglas (1985: 58), the difference in how lay people and experts view risk is the result of 'culturally learned assumptions and weightings' (i.e., competing knowledges about the world). She suggests lay responses should be acknowledged for their use and value within a particular cultural context instead of being considered as biased if they differ from expert assessments. Douglas's notion of risk also goes beyond the focus of the individual and is based on shared conventions and expectations. For instance, "a community uses its shared, accumulated experience

to determine which foreseeable losses are most probable, which probable losses will be most harmful and which harms may be preventable" (Douglas 1985: 69). Douglas collaborated with Wildavsky (Douglas & Wildavsky 1982) arguing not only that risk is socially and culturally constructed, but that it is constructed within the context in which hazards occur (i.e., based on the values, morals, beliefs, worldviews and social and political power relations in a place at the time) (Edelstein 1988; Boholm 1996; Tasney 2004). Douglas and Wildavsky recognize that to understand a hazard we must understand how they threaten people in the context of their everyday lives, a focus for the research in this thesis.

The 'risk society' perspective was originally offered by Beck (1987; 1992a; 1992b; 1999) and provides a sociological examination of risk. However, the work of Giddens (1990; 1991) contributed additional insight to this perspective and the role of risk in society. Beck and Giddens attempt to explain how technological environmental risk is increasingly dominating social life which can lead to profound individual and societal anxieties. In particular, Beck's (1992a; 1992b) 'risk society' describes a shift from simple modernity (industrialized society) towards reflexive modernity. This shift is characterized by: the presence of global hazards which have the potential to do large-scale damage to vast numbers of people; science and technology playing a central role in the diagnosis and control of these hazards – which they assess as low; laypeople increasingly recognizing the uncertainty associated with scientific assessments of these hazards; and, decreasing public acceptance of expert

decisions regarding technological risks –which brings into question the trustworthiness of these institutions. Public anxiety results when individual security is threatened which leads to conflict over technological hazards. Reflexivity occurs when individuals and institutions try to change their identities or the system being examined.

Gidden's (1990; 1991) 'juggernaut society' also focuses on the relationship between high-consequence global hazards, increasing public anxiety and reflexivity. In addition, Gidden's suggests that in late modernity individuals are *more willing* to allow their safety from dangers to be guarded by scientific experts. In order to prevent anxiety, people develop 'protective cocoons' based on trust and ontological security. Anxiety results when trust and security are shattered by events outside local control (e.g., the siting of waste disposal facilities). Reflexivity occurs when individuals choose a course of action (e.g., joining a citizens action group) to rebuild (although likely in a different form) their cocoon.

Despite the fact that Beck and Giddens developed their theories in isolation from each other there are many similarities. Overall, both agree that the process of reflexive modernization signals a fundamental shift in worldviews in society. That is, a society that is organized in response to risk. While this work offers critical insights into the structural and political features of risk (including the changes in the meaning of risk over the eras of modernity and the implications for subjectivity and social relations), Beck and Giddens have been criticized for

paying too much attention to high-consequence global risks. The study at Stoney Creek however, represents an example of a local-level issue that satisfies many of the characteristics outlined by Beck and Giddens (e.g., residents looking for zero-risk).

Finally, governmentality is a third perspective of the constructivist approach to risk. This perspective stems from the work of Foucault (1991) that explores the role played by experts in constructing and mediating discourses on risk. This includes the forming of knowledge and communication of risk through strategies, practices and institutions. According to this perspective nothing is a risk in itself, but instead what we understand to be a 'risk' is a product of historically, socially and politically contingent 'ways of seeing' (Foucault 1991; Lupton 1999). That is, we only come to know 'risk' through these discourses, strategies, practices and institutions, which then form the basis for action. There are parallels in the Stoney Creek study where process issues related to the siting of the landfill play an important role in residents' primary and secondary appraisal, and reappraisal (e.g., less opportunity for involvement once the facility became operational).

Indeed, the meaning of risk has changed over time. There is agreement, however, that it is important for researchers to address the characteristics of the hazards together with the characteristics of communities and individuals who actually experience the hazard in their everyday life (Edelstein 1988; Cutter 1993; Baxter & Greenlaw 2005). This understanding highlights the need for case

studies which address the role of place effects on risk perception. Some of the concepts that are investigated in this thesis are: community values or ways of life, worldviews, dread, trust, equity, uncertainty, control, and delayed effects. By utilizing a wide range of factors to examine residents' reactions to a landfill a more in-depth understanding of the reappraisal process in achieved.

2.4 Positioning Within the Existing Psychosocial Literatures

The literature contains several accounts of the substantial community opposition and psychosocial impacts that result from siting decisions regarding waste disposal facilities such as municipal landfills (e.g., Edelstein 1988; Hadden 1991; Taylor et al. 1991; Elliott et al. 1993; 1997; Elliott & Taylor 1996; Munton 1996; Elliott 1998; Wakefield & Elliott 2000; Baxter & Lee 2004). These studies have shown waste disposal facilities to cause varying degrees of concern, anxiety and worry in populations living in close proximity to them. The impacts of exposure to waste disposal facilities have been investigated in the context of proposed, approved and existing landfills, however, much less has been studied on community views of proposed facilities (Baxter et al. 1999; Wakefield & Elliott 2000). Overall, this work found higher levels of psychosocial effects in populations exposed to approved (opposed to existing) waste disposal facilities. For example, Elliott et al (1993) used a parallel case study design to investigate psychosocial effects in three solid waste disposal facilities: the Solid Waste Reduction Unit (SWARU) in Hamilton, the Hamilton-Wentworth Regional

Landfill site in Glanbrook and the Halton Regional Landfill in Milton. The findings of this study revealed higher levels of concern and action at Milton, a site that had only been recently approved (not constructed), compared with the other sites which were already in existence. In the context of siting waste disposal facilities, the well-being of individuals and communities is impacted as much (perhaps more) by the process of making the decision as by the outcome itself (Elliott et al. 1993; 1997; Hadden 1991; Wakefield & Elliott 2000; Baxter & Lee 2004).

Studies have shown the occurrence of environmental stress, the experience of psychosocial effects, and the choice of coping response to be dependent upon four types of mediating factors, relating to the characteristics of the contaminant source, the individual, the social network and the wider community system (See Elliott 1992). The four sets of factors were derived from environmental stress research and developed into a working conceptual framework (Figure 2.4). The mediating factors not only influence psychosocial effects and responses but also each other. This conceptual framework has been used by researchers to explain why waste disposal facilities are viewed and responded to differently by different groups of people, and at different stages of the siting process (i.e. pre- or post-siting processes) (e.g., Elliott 1992; Hadden 1991; Elliott et al. 1993; Wakefield & Elliott; Baxter & Greenlaw 2004; Baxter & Lee 2005). Knowing what factors shape residents' views is important for risk management, risk communication and siting future facilities.

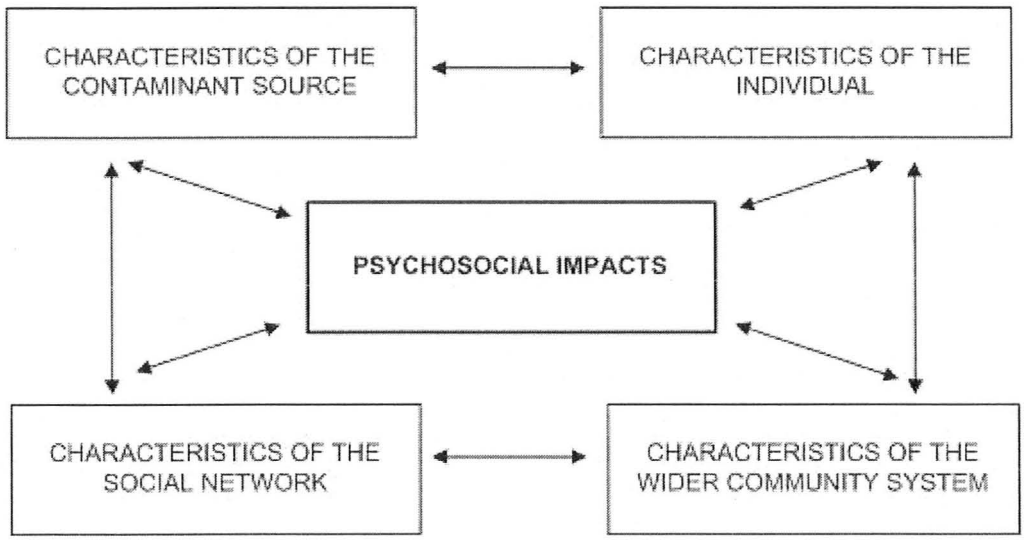

FIGURE 2.4 – Factors Influencing Psychosocial Impacts (Source: Elliott 1992)

The first mediating dimension found to influence the experience of psychosocial impacts involves the characteristics of the contaminant source. For example, Edelstein's (1988) assessment of the Legler community, a suburb in New York City, found that odour, noise and litter from the landfill contributed substantially to residents' life stress. Similarly, nuisance concerns (traffic, odour, noise) and uncertainty of future health impacts threatened core values in Greensville, Ontario, a site undergoing an environmental assessment process, and Stoney Creek, Ontario, a site that had recently been approved (Wakefield & Elliott 2000). A case study in Caledon, Ontario that investigated reactions to a proposed municipal landfill found reported psychosocial impacts to be associated

with the potential dread impacts of the landfill (Baxter et al. 1999). This uncertainty threatened residents' core values and ways of life. Further, issues related to spatial equity were the catalyst for opposition at the outset of the siting process, particularly the unfair distribution of risks. Fairness was also acknowledged as a determinant of concern in the study conducted by Baxter & Greenlaw (2005), particularly spatial equity, and the perceived inequitable distribution of compensation in the area.

The second mediating dimension involves the characteristics of the individual. For example, Elliott et al (1993) found age to be significantly related to concern reported at Milton where respondents were more likely to be concerned about the landfill if they were older. In the same study, dwelling tenure and distance were important variables in understanding concern and action around SWARU. Respondents were more likely to be concerned, and more likely to take action in response to site concerns if they owned a dwelling and lived closer to the site.

The third mediating dimension involves the characteristics of the social network. The psychosocial literature indicates that social support (kinship and friendship networks) and community participation are key factors influencing both the experience of environmental stress and the coping response (e.g., Edelstein 1988; Elliott et al. 1993). Wakefield & Elliott (2000) found the formation of social networks, along with other coping strategies, helped minimize experienced impacts. The important role of the 'shared experience' was further

highlighted in Caledon where residents joined community groups to slow down the siting process (Baxter et al. 1999). In the language of risk society (Beck 1992a; 1992b; Giddens 1990; 1991), residents formed networks in an effort to guard their 'protective cocoon'.

The fourth and final mediating dimension involves the characteristics of the wider community system. These characteristics include, for example, the nature of the political systems. In the study by Wakefield and Elliott (2000) the effects of the environmental assessment process on local residents and their communities was found to be predominantly negative. The effects reported by respondents stemmed primarily from the uncertainty inherent in a lengthy and relatively opaque legislative process, as well as residents' perceived lack of opportunity to participate in the pre-siting process. On the other hand, Baxter and Lee (2004) attributed low concern about facility risks in Swan Hills, Alberta in part to the recognizable economic benefits the facility provided to the town, stigma (in terms of outsiders views of the facility/town) and the voluntary siting process. In contrast, community worldviews related to trust were important for understanding concern around the Greensville and Stoney Creek landfills (Wakefield & Elliott 2000). Residents felt that neither the actors nor the technology could be trusted, and therefore the things they valued most in their community were in danger. Lack of trust in local officials was also found to be an important factor in understanding concern within the Legler community (Edelstein 1988), the Caledon community (Baxter et al. 1999) and the Fort

Assiniboine and Kinuso communities in Alberta (where sites were in existence) (Baxter & Greenlaw 2005).

Although these findings have motivated the ongoing development of a considerable literature on best practices for siting waste disposal facilities (e.g., Armour 1992; Rabe 1992; Kunreuther et al. 1993; Baxter et al. 1999), the focus remains largely on single cross-sectional and parallel case studies. Yet there is one case, in addition to the current study, where changes in psychosocial effects and coping were investigated through the analysis of longitudinal data. This study investigated the psychosocial impacts in a population living near a solid waste disposal facility in Milton, Ontario (Elliott et al. 1997). Residents' reappraisal of the Halton Regional Landfill site over a five-year period was examined. This study concluded that the landfill siting process elicited greater impacts than actually living with the landfill, confirming with what others have suggested (e.g., Hadden 1991; Elliott et al. 1993). That is, negative perceptions and concerns generally decrease as residents live with a landfill.

In terms of determinants, changes in the environmental stressor were fundamental in two respects: first, the shift of focus from the aftermath of the siting process in 1990 to the site itself in 1995; and secondly, the shift from anticipatory fears about an unknown (unseen) landfill in 1990 to a widely acknowledged state-of-the-art facility in 1995. Based on these changes, uncertainty and ambiguity were reduced among the residents and a sense of perceived control was restored. The absence of any measurable effects on

property values, along with the effective management and operating practices, were also found to contribute to residents' reassurance. Lastly, process issues were found to influence changes in effects and explain the relative success of the landfill in terms of acceptance in the community over time. The terms and conditions imposed by the Joint Board (i.e., a quasi-judicial tribunal which conducted the environmental assessment hearing on the site) ensured that community concerns were addressed and that residents were genuinely involved in all stages of the siting process.

Since longitudinal studies generate dynamic data they have the potential to provide richer information about individual behaviour and, thus will be useful for making informed decisions about managing waste disposal facilities and for siting future facilities with the least amount of conflict. While the particular circumstances associated with a specific facility are to some degree unique, knowing more about the characteristics of different waste disposal facilities and the communities hosting these facilities, like that of Stoney Creek, will be useful for developing strategies to make facilities safe and accepted.

2.5 Integrating Qualitative and Quantitative Approaches

Mixed-method approaches that integrate quantitative and qualitative methods have become more widely employed among health researchers in recent years (see discussions in Morse 1991; Carey 1993; Stange et al. 1994; Georing & Steiner 1996; Clarke 2003; Deren et al. 2003; Dixon-Woods et al. 2005). The

primary reason for integrating quantitative and qualitative methods has been to combine the different strengths of each method in order to 'know more' about the research topic (Greene & Caracelli 1997; Taskakkori & Teddie 1998; Morgan 1998; Dyck 1999; Moran-Ellis et al. 2006). Briefly, the main strengths of quantitative methods (e.g., surveys, questionnaires) include: objectivity; the testing of hypotheses; the ability to determine issues of causality; and, allowing for longitudinal measures on the research subjects to be carried out. Qualitative methods (e.g., interviews, focus groups) allow for: subjectivity; relativism; and, the experience, perception and meaning of a phenomenon to be understood (Eyles & Smith 1988; Greene & Caracelli 1997; Eyles 1998; Baxter & Eyles 1997; Giacomini 2001). Despite the different strengths of each method, researchers have also acknowledged that it is of equal importance to recognize the deep epistemological differences between quantitative and qualitative approaches to the pursuit of knowledge when integrating methods (Creswell 1994; Guba & Lincoln 1994; Greene & Caracelli 1997; Morgan 1998). As noted previously, both methods rely on very different assumptions about both the nature of knowledge and the appropriate means of generating knowledge (See Section 2.1.2). Such characteristics and/or assumptions define these traditions in important ways, but are not logically incompatible.

Morgan (1998) has outlined four strategies for integrating quantitative and qualitative methods within health research so that the contributions of each method are maximized, while at the same time the importance of each perspective

is acknowledged (i.e., the Priority-Sequence Model). Each strategy is based on two decisions: (1) a *priority decision* that pairs a principle method with a complementary method; and, (2) a *sequence decision* that determines whether the complementary method precedes or follows the principle method. According to Morgan (1998), along with other health researchers (e.g., Patton 1990; Elliott 1999), the goals of the research project should determine the strategy used. The methodological objective of the current study is to integrate qualitative and quantitative approaches to the research question. Here, qualitative in-depth interviews are used to inform the interpretation of quantitative survey data. This approach utilizes Morgan's (1998) third research design where qualitative methods serve to complement and follow-up a quantitative research effort. Research has shown that environment and health relationships are most usefully addressed through mixed-method approaches because it allows for a more comprehensive study and investigation of a wider range of phenomena (Elliott & Baxter 1994; Eyles 1998; Luginaah 2000; 2002; Wakefield 2002). The survey data allow for an investigation of the psychosocial outcomes (e.g., awareness, concern, action) and mediating factors (determinants) of the landfill siting process, as well as provides a longitudinal measure of residents' reappraisal of the landfill over time. The in-depth interview data allows for a more comprehensive understanding of the outcomes, mediating factors and reappraisal process of the landfill within the community context in which they are reported. That is, a richer account of how people act in and give meaning to their own lives within the

context of living in close proximity of the Taro Aggregates Ltd. East Landfill site in Stoney Creek, Ontario (Elliott & Baxter 1994; Eyles 1998). In this scenario, the principally quantitative project is strengthened through a complementary qualitative method. In so doing, some of the apparent gaps (knowledge and methodological) in reappraisal and psychosocial research are acknowledged, and a more holistic understanding of the impact that landfills have on people that live near them is developed.

2.6 SUMMARY

This chapter began by setting the geographic context necessary to explore changes in psychosocial effects and reappraisal of an environmental stressor over time. This thesis is situated within the geographies of health research with a focus on how living in close proximity to a landfill threatens local residents in the context of their everyday lives.

The theoretical basis for this study lies in the fields of environmental stress and coping as well as place effects. The theory of environmental stress and coping provides an understanding of the reappraisal process utilized by individuals exposed to risks, including the evaluation of both the environmental stressor and available coping strategies used to deal with the stressor over time. Macintyre et al's (2002) recognition of composition, contextual and collective, as well as the literature on risk perception (Lupton 1999), informs an analysis of the factors influencing the reappraisal process.

A review of the psychosocial literature regarding waste disposal facilities uncovered a few gaps in the existing research. In general, there is a lack of comparative, and longitudinal, studies that focus on residents' reappraisal of a landfill. Further, while reactions from host communities living with recently approved or already existing sites have received considerable attention in the psychosocial literature, much less has been studied in the context of proposed landfills.

In order to address the goals of this thesis, an integrated methodological approach is employed where qualitative in-depth interviews serve to inform quantitative survey results. An integrated method of this nature is useful when studying environment and health relationships as it not only allows for a more comprehensive study and investigation of a wider range of phenomena, but also reconstructs the meaning of landfills for people who live near them.

CHAPTER 3: RESEARCH DESIGN

The review of the literature (Chapter 2) is a prologue to the research methodology used in this thesis. This chapter reviews the research design in more detail, including the sample design, data collection methods and survey instruments used for each component of the research. Given the research objectives address an ongoing process of reappraisal it was appropriate to employ a longitudinal research design that incorporated an integrated quantitative/qualitative approach. Here, a qualitative study served to follow-up and inform a quantitative study. The quantitative study employed a two-stage data collection process in the community through the use of telephone surveys. This methodology allowed for changes in psychosocial effects and the reappraisal process to be effectively studied over time. Subsequent to that process, in-depth interviews were conducted with area residents and one Taro community group member. The follow-up qualitative study provided an interpretive resource for understanding the results from the quantitative surveys. Overall, the goal of this research design was to provide a more comprehensive, in-depth understanding of the reappraisal process that takes into account the contextual, compositional and collective characteristics of siting the Taro Aggregates Ltd. East Landfill site.

3.1 Quantitative Study

The quantitative study was divided into two-stages in order to effectively study local residents' reappraisal process. A telephone survey was administered during the decision-making process (i.e., after the Landfill site's Environmental Assessment document was approved but before the landfill was approved, Chapter 4) (1996), and approximately six years after the site was constructed and began operation (2002). The time lapse between the two-stages of surveying was important because the landfill was opened between the two data collection periods allowing for residents' reactions before and after the siting of a landfill to be examined. Both stages of surveying were performed by the Institute for Social Research (ISR) at York University, Toronto, Ontario under the direction of Dr. Susan J. Elliott, McMaster University, Hamilton, Ontario.

3.1.1 Sample Design and Data Collection Methods

The area surrounding the proposed Taro Aggregates Ltd. East Landfill site (at the site of the former Taro East Quarry) was divided into four zones based on distance from the site (Figure 3.1). An address for each household within the 2-kilometer boundary was drawn from tax assessment records (N=591). Each household address was verified using phone directories and mapped. A list of names and telephone numbers (obtained using phone directories) was given to the Institute for Social Research. In the first zone, the area closest to the proposed landfill, an attempt was made to complete an interview in every household (128).

In the second (195), third (137), and fourth zone (131), a sample of households was interviewed. The target number of completions for zones 2, 3, and 4 were 100, 75 and 75 respectively (Northrup 1996).

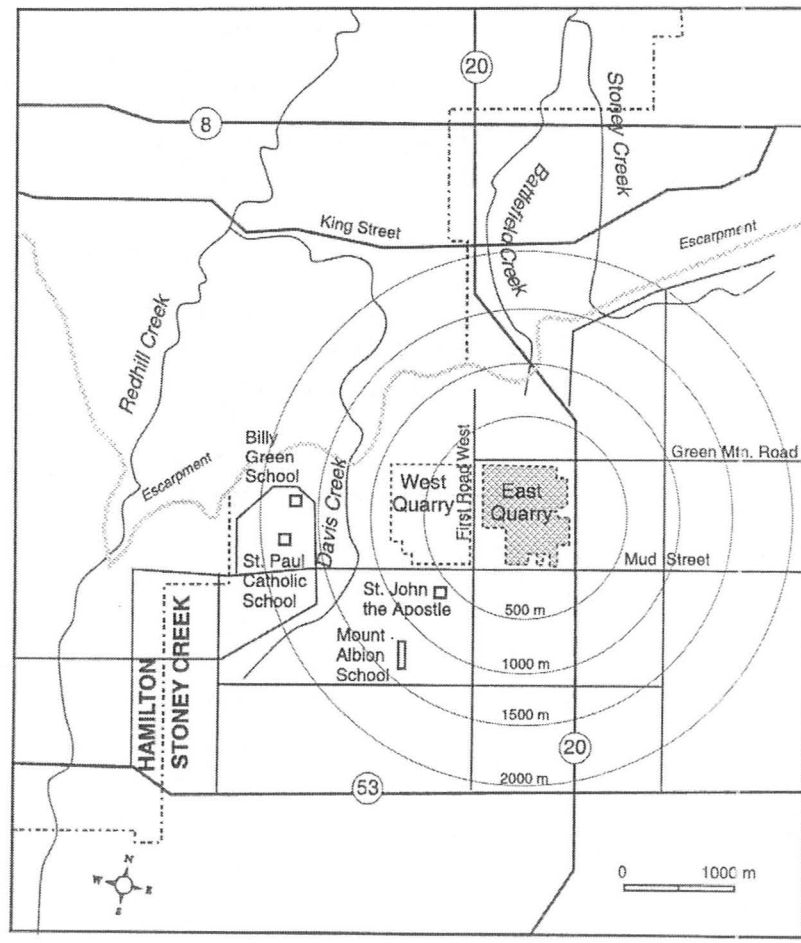

FIGURE 3.1 - Taro Aggregates Ltd. Proposed East Landfill Site (Source: Wakefield 1998)

In order to ensure random selection in each zone, as well as gender and age representativeness of the survey respondents, the adult (18 years of age or

older) within each selected household who had the next birthday was selected as the respondent. Research has shown that those who answer the telephone are not a random subset of the population; they are more likely to be women, the elderly, or people not in the labour force (Salmon & Nichols 1983; O'Rourke & Blair 1983). Each household selected for inclusion in the sample was sent a letter of introduction to the study (Appendix 1) informing them that an interviewer would be calling in the next few days to conduct a general quality of life telephone survey. The modified epidimiologic survey was introduced to participants as a general quality of life study so as not to raise awareness of the landfill issue prematurely (Section 3.1.2).

In total, 328 surveys were completed between June 3rd and July 15th 1996 (Table 3.1). In order to maximize the chances of getting a completed survey, call attempts were made during the day and evening, for both week and weekend days. A minimum number of twelve calls was made to each telephone number before replacement. Based on the 328 completed surveys, a final response rate of 67 percent was obtained for the 1996 baseline survey (Table 3.1). The response rate was defined as the number of completed surveys divided by the estimated number of eligible households times 100 percent. Of the 591 telephone numbers included in the 1996 baseline sample, 488 were identified as being eligible households. Not eligible households included non-residential or not in-service numbers, as well as households where the respondent was unable to speak English or was not healthy enough to complete the survey.

TABLE 3.1: SAMPLE SIZE

Zone	Distance	1996/Baseline	2002/Follow-up
1	0-500 m	61	37
2	500-1000 m	106	62
3	1000-1500 m	78	43
4	1500-2000 m	83	36
TOTAL	2.0 km	328	178
Response Rate		67%	71%

The sample for the follow-up study in 2002 was all respondents from the 1996 baseline study (N=328). The goal of the follow-up study was to complete surveys with as many of the respondents from 1996 as possible. In instances where the previous respondent could not be reached, another respondent was selected from within the same household as was sampled in 1996 (n=28). Respondents who had moved but still lived in the Stoney Creek area were surveyed (n=21). Of the 328 telephone numbers included in the 2002 sample, 252 were identified as being eligible households. In total, 178 surveys were completed between June 13th and August 10th 2002 (Table 3.1). Based on this number of completions, the 2002 follow-up study thereby achieved a response rate of 71 percent (Table 3.1) (Pollard 2002). Again, call attempts were made during the day and evening, for both week and weekend days to maximize the chances of getting a completed survey from each zone sample number. Attrition was due to out-

migration, death, illness, refusals and/or unsuccessful callbacks, and the inability to trace baseline respondents.

3.1.2 Survey Instrument

The survey instruments (Appendix 2) used in the 1996 baseline study and 2002 follow-up study were virtually identical. The instrument was developed out of a pre-existing epidemiologic survey used to measure psychosocial impacts in communities exposed to waste disposal facilities. Therefore, it makes methodological sense to use a similar survey instrument, thus allowing (albeit cautious) comparisons between the effects associated with these facilities. The original epidemiologic survey consisted of a combination of psychometric scales (SCL-90; GHQ-20; stressful life events, ways of coping) and site-specific questions (levels of awareness, concern, health concern, action). Prior to the completion of this thesis, the epidemiologic survey had been employed, in whole or in part, at 10 sites in Ontario and British Columbia (from 1990 to the present). More fundamentally, this survey had been employed to collect longitudinal data at the site in Milton, Ontario (Elliott et al. 1997). However, in order to ensure the objectives of the current project were addressed, the epidemiologic survey was circulated amongst a larger research team at McMaster University for comments. The principle investigator of the project, Dr. Susan J. Elliott, reviewed these comments and the necessary modifications were made to the survey instrument. Specifically, in 1996 the survey instrument was designed for administration in the

community living within 2km of the *proposed* Taro East Landfill site, while in 2002 it was designed based on an *existing* Taro East Landfill site. In addition, Goldberg's (1972) General Health Questionnaire (GHQ-20) was removed from the final survey for two main reasons: (1) Derogatis et al's (1973; 1977) SCL-90 scale was the primary instrument used in other studies, and (2) to create room for other site-related questions (since the survey was intended to only be 20 minutes).

The revised survey instrument addressed four site- and non-site-specific constructs: neighbourhood satisfaction, perceptions of the landfill, site-related action and self-reported psychosocial health. These measures were chosen to be included in the epidimiologic survey for the current project because they have been found to be extremely useful in: (1) measuring and understanding psychosocial impacts in a population exposed to an environmental stressor; and, (2) explaining adaptation through reappraisal around a community faced with an evolving environmental stressor (e.g., Elliott 1992; Elliott et al. 1993; Elliott et al. 1997; Luginaah 2000). A range of indicators in both the baseline and follow-up telephone surveys measured these constructs. *Neighbourhood satisfaction* was measured by asking questions about respondents' satisfaction with their areas as a place to live and what respondents would change about the area in which they live. Five indicators measured *perceptions of the landfill*: awareness, unsolicited site concern (i.e., major dislike), solicited site concern, health-related concern and effects of concern(s) on everyday life to the respondents. S*ite-related actions* were measured by asking questions about actions specifically related to the site

(e.g., have you ever considered moving because of the landfill; have you discussed your site concerns with friends/relatives/neighbours), as well as by asking a series of dichotomous emotion- and problem-focused coping questions based on the environmental stress and coping framework outlined by Lazarus and Folkman (1984).

General Health Status and SCL-90 scores were used as indicators of *psychosocial health*. General Health Status was measured based on perceived health status compared to others the same age and respondents' satisfaction with their health in general. Emotional distress was measured using a variant of Derogatis and others (1973; 1977) Symptom Checklist-90 (SCL-90). The original SCL-90 was based on a self-report rating scale orientated toward the symptomatic behaviour of psychiatric out-patients. However, reviewers of the epidemiologic survey instrument over time decided that a 12-item checklist of somatic items was most useful in population health surveys when exploring psychosocial health and wellbeing in the context of noxious environmental land uses (Taylor et al. 1989; Elliott et al. 1997; Luginaah et al. 2000). Somatic complaints in the original 12-item symptom checklist focused on gastrointestinal, cardiovascular, respiratory, headache and backache symptoms. However, further research led to the development of a modified 20-item symptom checklist in order to account for psychosocial symptoms. In particular, 8 relevant items were included from Goldberg's (1972) GHQ-20 relating to sleeping and eating disorders, stress, depression, rashes and other skin conditions. For each symptom, respondents

rated how bothered they had been by the symptom over the past 2 weeks on a 5-point scale from 0, 'not at all bothered' to 4, 'extremely bothered'. In addition, a potential confounder, stressful life events (e.g., marriage, divorce, job loss), was measured through selected items from the Holmes and Rahe (1967) stressful life events scale.

Socio-demographic questions were also included in the survey instrument in order to check on the representiveness of the sample, as well as to inform the investigation of the role of mediating factors in the reappraisal process.

The revised epidemiologic survey was pre-tested by the ISR to identify any problems with the questionnaire, including interpretation and timing issues. The pre-test was conducted the week of June 3rd 1996 with 8 households selected at random across the 4 pre-determined zones (Refer to section 3.1.1). The survey was completed with any knowledgeable adult person (18 years of age or older) in each household. There were no problems identified with the pre-testable questionnaire during the pilot test and the data collected was included in the 1996 baseline study.

3.1.3 Respondent vs. Non-Respondent Comparison

Since 150 of the original respondents from the 1996 baseline study did not participate in the 2002 follow-up study, these two groups were compared based on a range of socio-demographic characteristics (Table 3.3). The comparison revealed only two significant ($p<.05$) differences: (1) those interviewed twice

were less likely to report obtaining less than a high school education (9%) compared to those interviewed once (17%); and, (2) those interviewed twice were more likely to report full-time employment (68%) compared to those interviewed once (56%). These findings indicate that response bias is of minimal concern in the current analysis.

TABLE 3.2: 2002 RESPONDENTS vs. NON-RESPONDENTS

CHARACTERISTIC	Respondent 2002/Follow-up (N=178)	Non-respondent 2002/Follow-up (N=150)
% Female	55	54
Mean Age	47	45
% Household Income < $30,000	19	16
% Partner	76	71
% < High School Education*	9	17
% Full-time Employment*	68	56
Mean # of Persons/Household	3.5	3.5
% Households Children ≤ 17 years	52	63
% Own Dwelling	93	87
% Detached Dwelling	85	86

NOTE:

[1] * p<.05

3.1.4 Statistical Analysis

The Statistical Package for the Social Sciences (SPSS) was used to perform the analysis of these data (George & Mallery 2003). Descriptive analysis was carried out to document the frequencies of key variables (e.g. awareness, concern). Bivariate analysis was utilized to explore the relationships between outcome variables and socio-demographic characteristics (e.g. age and concern). Finally, multivariate analysis using logistic regression modeling was employed to understand the characteristics of respondents more likely to report psychosocial impacts and take action in response to impacts.

3.2 Qualitative Study

In-depth interviews (n=18) were the strategy of choice for the qualitative study in this thesis. These interviews were conducted with a sub-set of area residents and one Taro community group member. While in-depth interviews are often used in the initial stages of new research topics to uncover issues with a view to developing testable hypotheses (Willms 1989), here they were used to inform the interpretation of quantitative survey data. The interviews were employed to explore phenomena and processes at the individual level in more detail than is possible in a structured instrument such as a quantitative survey. Interviews consisted of a series of semi-structured, open-ended questions to which residents were allowed to respond in as much detail as they wished. By allowing people to talk at length, valuable contextual information may be included in their

response, which aids in the reconstruction of the ways in which they act in, and give meanings to, their own lives.

3.2.1 Sample Selection and Interview Checklist

The in-depth interviews were conducted with a sub-set of the quantitative survey respondents and one key informant in the community. Forty residents were randomly selected from those who agreed to be interviewed in this manner at the conclusion of the 1996 baseline telephone survey (n=159). The 40 selected households were also purposively selected so that residents living within zones one through four were represented (i.e., 10 households from each zone). This ensured maximum variation in the study community. All 40 residents were contacted by letter (Appendix 3) to inform them of the research project and ask for their cooperation, and were contacted again by phone to schedule an interview. After 17 area residents were interviewed, saturation was reached; that is, the point at which no new themes emerged from the data. The interviews took place between October 10th and November 23rd, 2005. The 17 area residents were interviewed at a place and time that was convenient to them (i.e., their home or a nearby coffee shop), and by the same interviewer. The interviewer verified that the interviewees were the same persons that participated in the previous surveys.

One key informant was also contacted to take part in the qualitative portion of this research. The informant was a citizen member of Taro's Neighbourhood Liaison Committee (TNLC) (a community group required under

the Certificate of Approval for the Taro Aggregates Ltd. East Landfill site). At the time, only two citizen members belonged to the committee and the second was not available for interview. While the informant did not take part in the previous surveys for this study, they have resided in the area since the Taro East Landfill was proposed and offer a key perspective (or 'information rich case') of the issue since they have been member of the community liaison group (Baxter & Eyles 1997).

The interviewer followed a checklist of topics to be discussed during the interview (Appendix 4). This helped to structure the interviews, while at the same time allowed residents to direct the conversation. The checklist comprised the minimum number of topics to be probed by the interviewer. These topics were investigated in all interviews to facilitate cross-interview comparisons when the interviews were analyzed. This research practice enhances rigour in interview analysis allowing for common themes to be identified (Lincoln & Guba 1985; Baxter & Eyles 1997). The checklist included subjects such as: neighbourhood likes and dislikes, concern and worries regarding the landfill, coping behaviours and changes in these factors over time.

All interviews were tape-recorded, in order to ensure the accuracy and credibility of the data, as well conducted in accordance with all McMaster University ethics guidelines. Notes were also taken during the interviews to ensure accuracy and confirmability (Baxter & Eyles 1997). In turn these tapes were transcribed verbatim using a word processor. Each interview was

approximately 60 minutes in length. The transcriptions were the basis of the analysis for this stage of the research.

3.2.2 Data Coding and Analysis

In terms of coding, two researchers independently read the same set of interview transcripts and marked discrete units of text on the transcripts. That is, the researchers marked down several words or phrases to summarize the themes contained within the transcripts (see Willms et al. 1989). Core themes were, therefore, derived bottom-up from the transcripts. The researchers then devised an agreed-upon set of codes based on the separate words or phrases they each used to code the transcripts. This established inter-coder reliability. The remainder of the transcripts was then coded by one researcher using the appropriate codes in the margins beside the relevant discrete units of text. This was an effective way of identifying similarities across and differences between groups (i.e., cross interview comparisons).

Two dependability checks were then used in order to establish level of agreement (Miles & Huberman 1994; Baxter & Eyles 1997). An intra-rater reliability test (Miles & Huberman 1994) termed 'test-retest' was performed in order determine the extent to which phenomena were consistently matched within the coding scheme. The researcher independently coded the same transcript after an interval of two months. The results of this test indicate that the reliability of the coding (calculated as the number of coding agreements divided by the total

number of agreements plus disagreements, following Miles & Huberman 1994) was 85%. Values over 70% are generally considered acceptable (Miles & Huberman 1994). A second dependability test (inter-rater reliability test) was done between the researcher and another qualitative researcher who was familiarized with the project and the objectives of the coding (Miles & Huberman 1994). A value of 72% was obtained.

After the transcripts were coded they were manually entered into the computer using a qualitative software package called QSR NUD*IST, a hierarchical data indexing program (Richards & Richards 1992). This software package was chosen because of its technical capabilities with textual documents (i.e., data retrieval and indexing; See Richards & Richards 1993).

The goal of the data analysis procedure was to elaborate and add meaning to the results from the quantitative study. Contextualized thematic analysis was used to present quotations as narratives in the findings (i.e., the words of the participants) that are connected to the codes (themes) in the analysis. The rationale for choosing the quotations to present was two-fold: (1) to ensure respondent representativeness (i.e., incorporating the opinions from a range of respondents); and, (2) theme representativeness (i.e., to reflect not only the common view, but also the 'negative cases' according to Lincoln and Guba (1985)). Consistent with Lincoln and Guba (1985), the use of negative cases adds to the dependability of the research and further gives the developing theory greater breadth and strength. The quotations represent the meanings of various

phenomena for residents (participant-derived) living near the Taro Aggregates Ltd. East Landfill in Stoney Creek. The quotations will inform the frequency data provided by the quantitative research.

Another method of improving the credibility (i.e., authentic representation of the respondents experiences) of the research is through 'member checking' (Baxter & Eyles 1997). This process involves asking the individuals from whom the data were obtained if they feel that their general perspective was interpreted accurately by the researcher (Baxter & Eyles 1997; Miles & Huberman 1994). This avoids misinterpretation of meanings expressed through interview conversations. The main mechanism for member checking in this study was a three-page feedback document and response letter (Appendix 5). The response letter included a summary of the preliminary results. The entire package was circulated to the participants to assess credibility. Fifty-five percent of the participants responded. The responses received indicated substantial agreement with the researcher's representation of their experiences.

The issue of transferability, the degree to which the findings of the research fit within contexts outside the study, is shaped by the fact that this research is a case study and, therefore context specific (Baxter & Eyles 1997; Miles & Huberman 1994). However, the take-home messages and policy implications of this research are transferable to other communities undergoing a landfill siting process, as well as future communities that may host a landfill.

3.3 SUMMARY

This chapter described the research design chosen for this study. The research is longitudinal in design, involving an integrated quantitative/qualitative approach. The quantitative study consisted of a two-stage research design where telephone surveys were used to measure changes in psychosocial effects and reappraisal of the Taro Aggregates Ltd. East Landfill site over time. Three hundred and twenty-eight telephone surveys were conducted with local residents living within 2 kilometers of the site at baseline (1996), and 178 during follow-up (2002). In-depth interviews were conducted with a sub-set of respondents in 2005 to add further meaning to the survey results. In total, eighteen in-depth interviews were conducted. These interviews were transcribed, coded and analyzed using a qualitative software package (NUD*IST).

CHAPTER 4: LEGISLATIVE, COMMUNITY AND SITE CONTEXTS

Chapter 4 acknowledges that experience of, and response to, environmental risk occurs within a community and, in this case, legislative and site contexts. First, this chapter discusses the legislative context within which this research takes place. The siting of landfills in Ontario, Canada occurs within the legislative framework of the Environmental Assessment Act (EAA). Subsequent to this, the Stoney Creek community under study is profiled using secondary sources (e.g., census data). As documented in previous chapters, research on psychosocial impacts has shown that they cannot be separated from the wider community context in which they occur (White 1981; Buttel 1987; Edelstein 1988; Elliott et al. 1997; Elliott 1998). That is, the particular circumstances associated with a specific facility are to some degree unique. This conceptual context provides the rationale for compiling a community profile. The profile describes the community as it was in 1996 and 2002 in terms of location, administration, population, site-related interest groups and media. Lastly, the site history of the landfill siting issue in Stoney Creek is outlined. A timeline of key events including when the data for this study was collected are provided.

4.1. Legislative Context

Environmental assessment is a planning process to predict the environmental effects of proposed initiatives before they are carried out. The main purposes of environmental assessment are to minimize or avoid adverse environmental effects before they occur and incorporate environmental factors into decision-making (RSO 1990). In Ontario, the legal basis for environmental assessment occurs within the framework of the Environmental Assessment (EA) Act. The EA Act, passed by the Ontario government in 1975, sets up a process for reviewing the environmental impact of proposed activities (RSO 1990). The Act applies to government ministries and agencies, conservation authorities and municipalities. The Act is intended to promote sustainable development by ensuring that the proposed works and activities do not cause significant adverse environmental effects within and outside the jurisdictions in which they are carried out, increased protection of human health, minimized risks of environmental disasters, increased government accountability and an opportunity for public participation (Environment Canada 2005). Although the environmental assessment legislation primarily applies to public works, most private sector waste management undertakings, including the case study in Stoney Creek, are designated by the Minister of the Environment (MOE) as subject to the EA Act (RSO, 1990). The legislation underwent substantial revision in 1997 by a newly elected conservative provincial government; however, the environmental assessment investigated in this research took place prior to the legislative changes

(Environmental Assessment & Consultation Improvement Act 1996). The following therefore describes the process as it existed before 1997.

The EA outlines a series of steps to be followed by a proponent to ensure the potential impacts on the natural, social, cultural and economic environments are evaluated (RSO 1990). First, the proponent submits an EA document to the Ministry of the Environment. The EA document describes the undertaking and its potential affect on the environment. Possible alternatives to the activity are also outlined. The Environmental Assessment Branch circulates the EA document for government review to all interested provincial ministries and agencies, as well as federal bodies. The Branch prepares a summary review. The MOE releases the EA document and its government review to the public for comment (minimum 30 days). At the end of the public review one of three decision-making routes is followed (Figure 4.1): (1) if no significant environmental effects are anticipated the MOE accepts the environmental assessment document and, subsequent to a 15 day public review period, approves the undertaking; (2) should the MOE representative receive what s/he perceived to be valid concerns raised in opposition during the 15 day public review period, s/he may call for a full public hearing in front of an EA Board (i.e., a quasi-judicial tribunal of provincially appointed hearing officers); or, (3) the MOE may decide to refer the matter directly to the Board for a public hearing, if s/he feels the undertaking presents potentially significant environmental effects. In the case of both (2) and (3), the final decision is made by the EA Board, but both the public and the proponent

have one last avenue of appeal to the Provincial Cabinet. The environmental assessment process for the Stoney Creek landfill followed the first decision-making route outlined above. The details of this process will be discussed in Section 4.3.

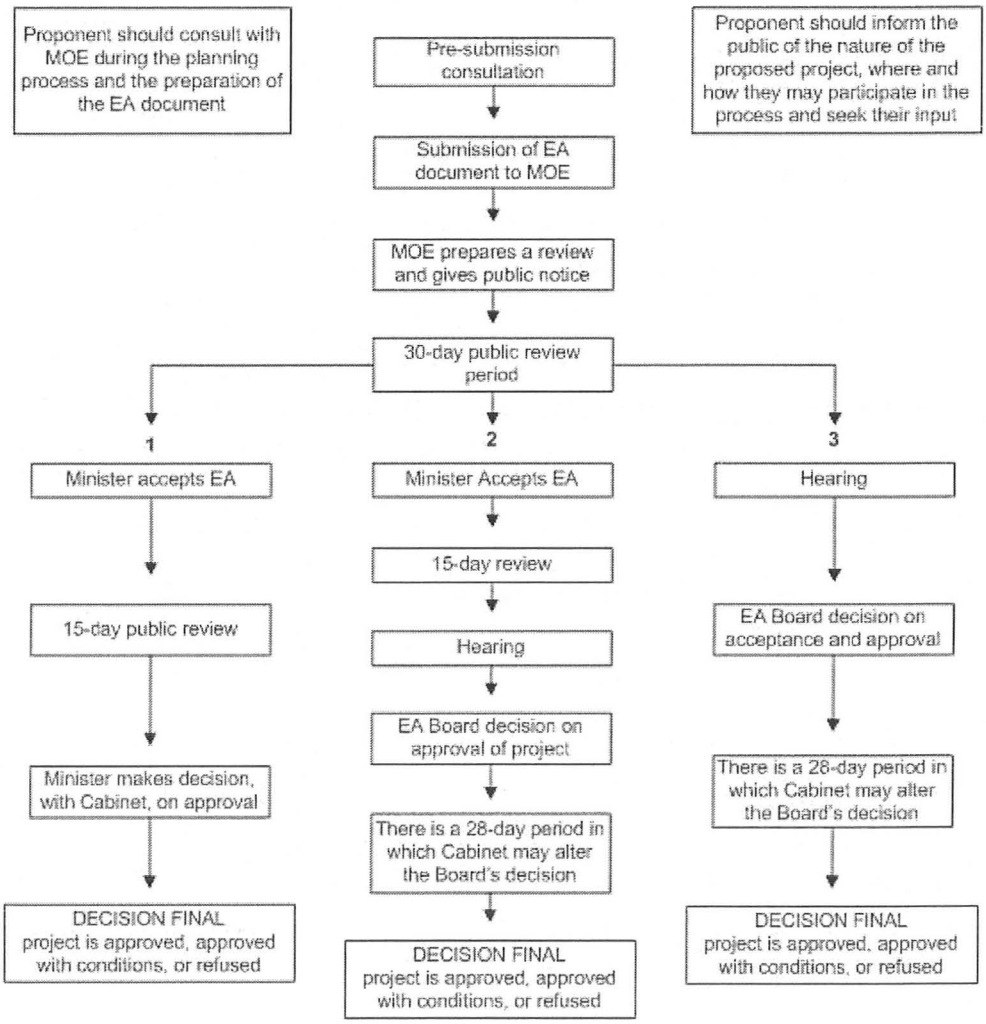

FIGURE 4.1 – The Environmental Assessment Review and Approval Process (Source: Ministry of Environment and Energy 1994)

4.2 COMMUNITY CONTEXT

4.2.1 LOCATION

The amalgamated City of Hamilton, Ontario (2001) is located at the western end of Lake Ontario, approximately 67km west of Toronto. The City of Hamilton includes Hamilton, Flamborough, Dundas, Ancaster, Glanbrook, and Stoney Creek. The Taro Aggregates Ltd. Landfill site under study is located in upper Stoney Creek about 1km south of the face of the Niagara Escarpment (Figure 4.2). The landfill is situated north of Mud Street, east of Highway 20, adjoining the existing Taro West Landfill and at the site of the former Taro East Quarry (Figure 3.1).

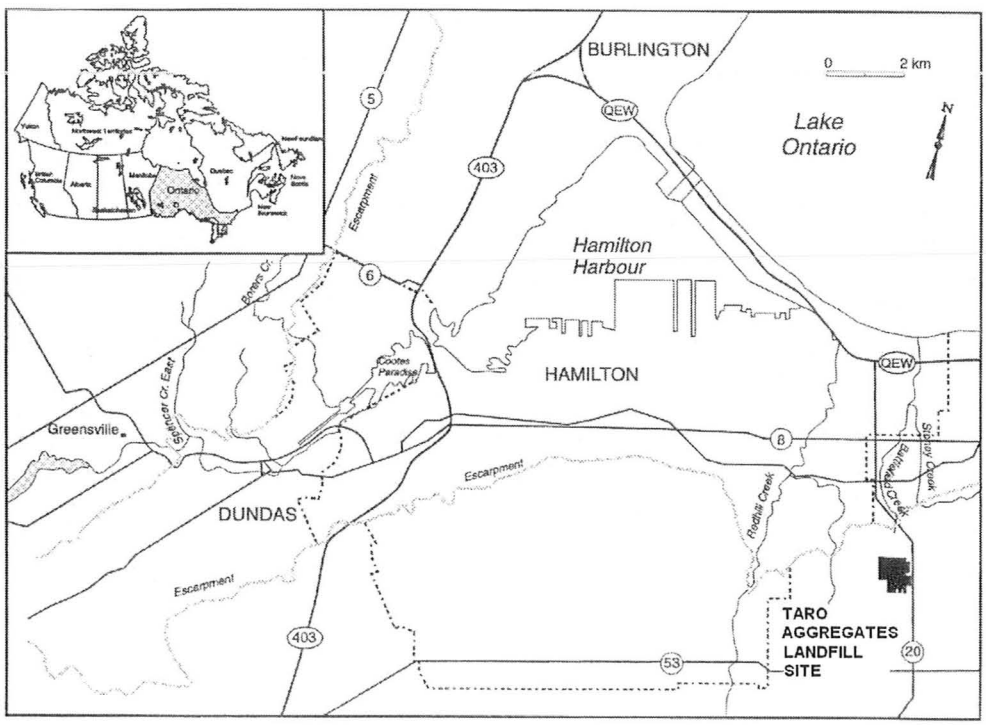

FIGURE 4.2 – Study Site Location, Stoney Creek, Ontario (Source: Wakefield 1998)

4.2.2 ADMINISTRATION

In 1996, when the first round of data was collected for this thesis, the City of Stoney Creek was part of the Regional Municipality of Hamilton Wentworth (1973), along with the City of Hamilton, the Towns of Dundas, Ancaster and Flamborough, and the Township of Glanbrook. The Regional Municipality of Hamilton-Wentworth was responsible for physical, social and economic planning. It was responsible for all waterworks, sewage, waste disposal, policing, roads and drainage, transit, social services and health. The Region was controlled by a Regional Council, including an elected Chairman, the mayors of the six constituent municipalities, all 16 members of the Hamilton City Council, and one additional representative from each other municipality. The local council in Stoney Creek consisted of nine seats, one that represented upper Stoney Creek where the landfill site under study is located. The municipality of Stoney Creek was responsible for local planning, local streets and sidewalks, solid waste collection, fire protection, parks and recreation, and a number of other local responsibilities at this time.

In January 2001, the Towns of Ancaster, Dundas, and Flamborough, the Township of Glanbrook and the Cities of Hamilton and Stoney Creek were amalgamated and became the new City of Hamilton. The City of Hamilton is controlled by 26 elected officials, including; the mayor, city councilors (including one that oversees ward 9 in which the Stoney Creek community under study falls within), members of the provincial parliament (including one representing Stoney

Creek) and members of the federal parliament (including one representing Stoney Creek). The City government is responsible for all corporate (i.e., industrial waste disposal) and emergency services, planning and economic development, public health and community services, human resources and public works (My Hamilton 2005).

4.2.3 POPULATION

In 1996, the total population of the City of Stoney Creek was approximately 54,318 (Statistics Canada 2002). At this time, upper Stoney Creek was developing as a residential community. Many farms were being turned into subdivisions and the area was being characterized as a new suburb of Hamilton. Based on 2001 Census data, the area continued to develop over time. The total population for the area in 2001 was approximately 57, 380 (Statistics Canada 2004). This number is estimated to be slightly higher for the year 2002.

Based on 1996 and 2001 Census data, sociodemographically the 1996 Stoney Creek community is similar to the 2002 Stoney Creek community under study (Table 4.1). It can be categorized as a suburban, middle-class community at both points in time. The only substantial change over time is related to education. Fewer households reported obtaining less than a high school education in the 2001 Census.

TABLE 4.1: SELECTED SOCIODEMOGRAPHIC CHARACTERISTICS OF THE STUDY COMMUNITY

	1996		2001	
CHARACTERISTIC	Stoney Creek	Ontario	Stoney Creek	Ontario
% Female	51	51	51	51
Mean Age	36	36	38	37
% Household Income < $30,000	19	25	16	18
% Partner	63	57	64	60
% < High School Education	23	33	18	17
% Full-time Employment	30	30	31	31
Mean # of Persons/Household	3.1	3.1	2.7	3.0
% Households Children ≤ 17 years	69	72	67	70
% Own Dwelling	79	64	81	68

(Source: Statistics Canada, 1996 and 2001 Census)

When compared to the province of Ontario a few differences are noted (Table 4.1). In 1996, the province had a higher percentage of households reporting an income less than $30,000, as well as an education less than high school compared to Stoney Creek. On the other hand, the community had higher

percentages home ownership compared to the province as a whole. All other variables show a similar relationship between the Stoney Creek community under study and the province.

It is also instrumental to examine the representativeness of the **sample characteristics** for the 1996 and 2002 datasets. Table 4.2 shows the correspondence between the characteristics of the 1996 baseline study with those of the 2002 follow-up study. Sociodemographically, the two samples are similar in several aspects, with only minor differences related to the time lapse (6-years) between the two-stages of surveying. As a result, the 2002 sample on average was slightly older, had fewer children in the household 17years of age or younger, and had lived in their current address/area longer. The samples substantially differed in the percentage reporting full-time employment. The 2002 sample has a significantly higher percentage of households reporting full-time employment. There are several take home-messages from this analysis. First, the Stoney Creek community under study is essentially a middle-class neighbourhood. Second, the large majority of these people live in single-detached dwellings occupied by their owners. Third, the community under study has a large percentage of family households indicated by the percentage of households with children 17 years or younger, together with the mean number of persons per household and percentage of partnered relationships.

TABLE 4.2: SAMPLE CHARACTERISTICS		
Characteristic	1996/ Baseline (N=328)	2002/ Follow-up (N=178)
% Female	54	55
Mean Age***	40	47
% Household Income < $30,000	14	19
% Partner	72	76
% < High School Education	15	9
% Full-time Employment*	56	68
Mean # of Persons/Household	3.6	3.5
% Households Children ≤ 17 years**	66	52
% Own Dwelling	90	93
% Detached Dwelling	85	86
Mean Number of Years at Current Address***	9.2	15
Mean Number of Years in Area***	13.4	19.5

NOTE:

[1] * p<.05

** p<.01

*** p<.001

New young families seem to have chosen Stoney Creek to raise their families. One of the main reasons for selecting Stoney Creek over other suburban communities like Ancaster and Dundas may be the cost of living. Stoney Creek provides the rural characteristics and small town atmosphere people are seeking at a more affordable cost of living (Statistics Canada 2002; 2004). This data also establishes that in 1996: (1) this was a relatively new residential area; and, (2) half the sample moved to the area while the Taro Aggregates Ltd. West Quarry (operated at the same site in Stoney Creek) was operating as a *landfill* and the Taro Aggregates Ltd. East Landfill site under study was operating as a *quarry* (prior to its conversion to a landfill) (Section 4.3).

4.2.4 Site-Related Community Interest Groups

The City of Hamilton (My Hamilton 2005) is a host to a number of citizens' organizations and community groups, with a large number of them related to environmental issues. The landfill opposition group that formed specifically to address the Taro Aggregates Ltd. East Landfill site was the Stoney Creek Residents Against Pollution (SCRAP). This community group formed in March 1995 and held a number of public rallies to protest the proponent's proposal and highlight the health impacts that they anticipated.

As a condition of its operating license (or certificate of approval), the proponent also established a Community Liaison Committee (CLC) in 1999, comprised of residents and politicians from the upper Stoney Creek area. The

CLC was responsible for reviewing the operations of the Taro East Landfill site and answering questions on matters of concern to the community. Instead however, the group saw their role as studying the proposal and siting of the landfill *for* the community, rather than reporting *to* the community (See Wakefield & Elliott 2000). The CLC committee, therefore, held only a few public meetings around the issue between 1999 and 2002. The CLC's misconception regarding their role as a liaison group seems to have stemmed from the lack of direction given by the Ministry of the Environment, as well as the direction given to the group by the proponent (See Wakefield & Elliott 2000). The original CLC no longer exists, and has been replaced by the Taro Neighbourhood Liaison Committee (TNLC). The TNLC is comprised of four citizen members (one which participated in the qualitative component of this study), a Taro representative, and a City of Hamilton representative (TNLC Terms of Reference 2005). The Minister of the Environment is an invited representative to the meetings held by the TNLC, but is not on the committee formally. The main difference between the replacement committee and former CLC is that TNLC meetings are not open to the public. Under the TLNC's terms of reference (2005), the TNLC will communicate with Taro-neighbourhood residents by sending out an annual newsletter from the committee summarizing year activities. Neighbours are instructed to contact Taro directly if they have any questions regarding annual reports, have complaints or other matters of concern relating to the operation of the landfill. Only if Taro does not satisfactorily address the question(s), the

neighbour can contact the TNLC, but only via email. This overhaul appears to have dramatically limited public consultation in the landfill post-siting process.

4.2.5 MEDIA

The residents of Stoney Creek also had access to a variety of local media sources, including a daily newspaper (i.e., the Hamilton Spectator), and a weekly newspaper (i.e., the Stoney Creek News), seven regional radio stations (i.e., KLITE FM – 102.9, CHAM – 820, CHML – 900, CJXY – Y108, CKOC –1150, CHMR – 91.7 and CHMU 93.3) and a local cable access channel (Channel 14) during the siting process of the proposed Taro Aggregates Ltd. East Landfill site; however, coverage of the siting process on radio and television was occasional at best. The two local newspapers – the regional daily newspaper, the Hamilton Spectator, and the free community weekly, the Stoney Creek News – provided the largest amount of coverage on the issue (Wakefield & Elliott 2003). The Environmental Assessment and siting process resulted in a total of 320 stories published within the two local newspapers (Wakefield & Elliott 2003). Content analysis of these two newspapers revealed that between 1994 and the end of the study period, there was only one month in which neither paper provided issue coverage, and some months saw more than 10 articles (Wakefield & Elliott 2003). While the frequency of issue coverage was high, Wakefield and Elliott (2003) also found coverage of the issue to be selective. That is, coverage increased around key decision periods in the EA process (i.e., the submission of the

proponents EA Document) and when controversial issues arose (i.e., the leaking of leachate). Consequently, the three main themes that dominated coverage included process, environmental degradation, and technology. Overall, the newspaper was seen as an inconsistent source of risk communication. Despite this, Wakefield and Elliott (2003) found the newspaper to be a regular and important source of information among residents; however, this reliance was also paralleled with distrust of the material contained within the newspapers. Instead, people (i.e., social networks with friends, neighbours) were identified as the most effective and credible risk communication tools.

Residents also had access to a number of other sources of information during the landfill siting process, including four public meetings, open houses, pamphlets delivered to homes in the area and official documentation (e.g., the proponent's Environmental Assessment (EA), and the associated review and technical documents produced by both the proponent and reviewing agencies) available from the proponent and local libraries. The proponent relied heavily on pamphlets and newspaper advertisements to communicate with the public about their proposal to site the East Landfill and to advertise open houses and public meetings. In addition, a website was created in 2002 (Taro Aggregates Ltd. 2002). The proponent distributed 5 different newsletters between 1999 and 2002 to the residents living in close proximity to the landfill (Taro Aggregates Ltd. 2002).

4.3 Site Context

Taro Aggregates Ltd. (Taro) is the company that is responsible for the proposed, and now operating, Taro East Landfill site under study in this thesis. Taro is a subsidiary of Philip Environmental Inc.. Phillip Environmental Inc. carries on a resource recovery and waste management business in the City of Hamilton as well as other places in Ontario and Canada. Phillip used the landfill to dispose of any waste that could not be recycled or reused. The company's reputation, however, has been questioned over the years (Maclean's 1998). Philip Environmental Inc. has been involved in several class-action law suites and controversies with regards to financial and environmental issues. The Corporations' histories (Taro and Philip) have been identified by previous research as an important factor in sensitizing the local community to the potential negative effects of the Taro East Landfill, which contributed to a loss of community trust in the corporations (Wakefield & Elliott 2000).

Prior to its waste management business, Taro used the site in Stoney Creek for quarrying because it is situated on fractured limestone bedrock. In the early 1950s, A. Cope and Sons Construction Company opened the West Quarry site and in 1971 sold this site to Taro Aggregates Ltd.. In 1976 Taro established an East Quarry site adjacent to the West Quarry. In the early 1980s however, the Taro West Quarry became fully exploited and Taro began using it to landfill solid non-hazardous industrial, commercial and institutional waste. At this time, the adjacent East Quarry was still being used to extract limestone. Due to the Taro's

location over fractured limestone bedrock, however, the West Quarry had little natural ability to contain wastewater, or leachate (a toxic liquid produced in a landfill from the decomposition of waste within the landfill), and so required the construction of an engineered liner system. However, the West Quarry site was not engineered to prevent the escape of leachate into the groundwater. Consequently, a plume of leachate began to migrate off-site and impacted the surrounding groundwater. During the construction stages of the Taro West Landfill, there were relatively few people living nearby. However, as operations continued residential development in the vicinity of the landfill multiplied and the profile of this situation increased. Further, as discussed in Section 4.2.1, the Taro site (West and East Landfills) is located about one kilometer south of the face of the Niagara escarpment in upper Stoney Creek, Ontario. The Niagara escarpment has been designated an Area of Natural and Scientific Interest (ANSI) by the Federal government and a United Nations Bio-Reserve. This places the Taro site in what is consider environmentally sensitive lands.

By 1988, Taro concluded that the West Landfill would reach capacity in the year 1995. As a result, Taro publicly announced their plans for a second landfill on November 30th, 1989. Taro proposed to operate the second landfill site in the East Quarry in order to: (1) continue its existing landfill business; (2) meet the needs of its customers (e.g., Dofasco); and, (3) assist Phillip Environmental Inc. in their waste management business. This announcement marks the beginning of the EA process at his site (Table 4.3).

TABLE 4.3: TIMELINE OF EVENTS (1989- 1995)

DATE	EVENT
30 November 1989	**Taro Aggregates Ltd. (the proponent) publicly announces plans for a second landfill**
February 1992	Pre-submission consultation with the community begins (a requirement under the EA Act)
21 May 1992	First public meeting held
23 June 1992	First meeting of the landfill Study Group
31 March 1993	Public workshop held by proponent
November 1993	Taro discovered dumping leachate in Hamilton Harbour from West Landfill site
22 February 1994	Public workshop held by proponent
June 1994	Improper zoning of proposed East Landfill site disclosed
29 November 1994	Open house held by proponent
26 January 1995	**Proponent submits EA Document to the Minster of the Environment (MOE)**
March 1995	Stoney Creek Residents Against Pollution (SCRAP) formed
May 1995	SCRAP holds public rally to protest proposal and highlight the health impacts they anticipate
September 1995	**The MOE Accepts proponent's EA Document**

After Taro decided a new landfill was needed, and as a requirement under the EA Act, they began a pre-submission consultation process with the community (Province of Ontario 1990). In order to facilitate this consultation process, Taro established a Study Group. The Study Group was mandated to review the proposed undertaking on behalf the community. Taro, however, guided the agenda of the community consultation process. The Study Group was made up of 2 industry spokespersons, 2 government representatives and 7 community residents who met monthly for 2.5 years, attended public meetings, as well as several day-long workshops, held open houses, and conducted door-to-door 'communication campaigns' (i.e., pamphlet distribution) to inform their neighbours about the proposal. These activities generally ensured a comprehensive consultation process for the proponent. The findings of the Study Group essentially supported the proposal. However, the Study Group raised two issues: (1) the need to look outside areas owned by Taro for potential sites; and, (2) the need for a more detailed analysis of the alternatives. Taro defended their original decision (i.e., Decide-Announce-Defend Strategy). Community opposition was stimulated when Taro was discovered dumping leachate in Hamilton Harbour from its West Landfill in November of 1993. In addition, the Hamilton Region Conservation Authority (HRCA) and the Niagara Escarpment Commission (NEC) conducted their own peer reviews and were opposed to the East Landfill based on concerns about the potential environmental impacts.

Taro submitted a formal EA Document to the Minster of the Environment (MOE) on January 26th 1995. This public document summarized the anticipated effects of the facility vis-à-vis a range of issues, including human health, air quality, ground- and surface-water quality, visual impacts, nuisance (i.e., noise and truck traffic), social impacts and property values (Taro Aggregates Ltd. 1995). The document concluded that the impacts of the proposed facility would be minimal. Despite such a protracted, resource-rich community consultation program, there was still substantial opposition to the proposal from area residents and community groups. At the time of submission a vocal opposition group SCRAP (Stoney Creek Residents Against Pollution) formed to protest the proposal and highlight anticipated health impacts.

As required by the EA Act, the EA document was reviewed by the government ministries, agencies and the public (RSO 1990). The MOE approved the proponent's EA document in September of 1995. The first round of survey data was collected after the MOE approved the EA document (Table 4.4). During this period uncertainty regarding the proposal was most likely at a peak among the community since residents were uncertain if their opposition would result in a public hearing or if the proposed undertaking would be approved forthwith (See Figure 4.1).

In the summer of 1996 the MOE decided that an environmental assessment hearing was not necessary (i.e., in this case a full public hearing in front of an EA Board was not necessary) and granted approval to proceed with the

undertaking of the Taro East Landfill site, despite public concern. Many community residents opposed to the landfill were frustrated by the MOE's decision not to hold a public hearing. SCRAP protested this decision, but felt their funds were too limited to allow them to appeal. The study completed by Wakefield & Elliott (2000) reported that residents within Stoney Creek felt that they had only 'perfunctory opportunities to get involved' and little opportunity to effect any real change or influence the process. The East Landfill began accepting waste in December of 1996.

TABLE 4.4: TIMELINE OF EVENTS (1996)

DATE	EVENT
3 June 1996	***First Round of Quantitative Data Collected***
15 July 1996	**The Minister of the Environment grants approval to proceed with undertaking of the East Landfill without a public hearing.**
August 1996	SCRAP decided not to appeal decision to Ontario cabinet
December 1996	Leachate discovered leaking from existing West Landfill site
December 1996	**The East Landfill begins accepting waste**

Between the time when East Landfill operations began (December 1996) and when the second round of data were collected in 2002, however, there were a

series of high profile (potentially concern evoking) events related to the operating practices of the landfill which occurred (Table 4.5).

TABLE 4.5: TIMELINE OF EVENTS (1997-2000)

DATE	EVENT
April 1997	Allegation of corruption on the Stoney Creek Council surface
June 1998	Toxic waste enter landfill from Robertson Whitehouse
September 1998	**Toxic waste allegedly entered site from CyanoKEM Inc.**
9 October 1998	**MOE ceases Taro operations for violating regulations**
October 1999	**Leachate discovered leaking from East Landfill**
17 Sept. 1999	MOE investigation clears Philip & Taro of any violation of regulation
December 1999	First Taro Community Liaison Committee (CLC) Report
2 March 2000	Expert Panel appointed by MOE to update CLC and MOE
29 March 2000	All *exposed* Robertson Whitehouse material removed from site
17 May 2000	Public Meeting held by Taro CLC
27 June 2000	Public Meeting held my Taro CLC
30 September 2000	Open house held by Taro Aggregates Inc.
October 2000	Expert Panel Final Report

These major developments (or in the language of environmental stress theory (Lazarus & Folkman 1984), triggers) had the potential to change residents' perception of the East Landfill site. Leachate was discovered leaking from the site, there were cases of illegal dumping of toxic waste (e.g., from Robertson Whitehouse, a waste generator in Milton, Ontario) and there were allegations of illegal dumping events. For example, filtercake wastes (consisting of solid residues left over from the treatment of hazardous liquids) from a Philip-owned plant in Michigan called CyanoKEM were sent for processing to the Imperial Street Plant after first going to the Parkdale facility (all owned by Philip) which legally redefined the waste as 'local' wastes (because Parkdale became the (local) generator even though the wastes had originated outside the province) (Bell et al. 2000). At the Imperial Street Plant, the CyanoKEM wastes were stabilized and passed the leachate toxicity test. The waste was therefore legally suitable for deposition in the non-hazardous Taro East Landfill site. According to the Taro's best estimate, approximately 90,000 tonnes of stabilized or solidified waste was deposited in the East Landfill site between December 1996 and September 1998. On October 9, 1998, MOE sent a letter to Taro instructing them to cease depositing stabilized waste at the East Landfill site pending further investigation. The letter further alleged that Taro was acting in violation of Regulation 347 (The implications of this allegation were quite severe. If convicted, the corporation would have been liable for fines that could amount to hundreds of millions of dollars and possible prison sentences for senior officers.). The Ministry took this

action in response to complaints received from SCRAP that claimed that the waste manifests had been altered to disguise the hazardous nature of the waste once it had crossed the border.

The MOE referred the matter to the Investigations and Enforcement Branch (IEB). Meanwhile the CBC program *The Fifth Estate* broadcast a documentary alleging that the corporation had illegally deposited hazardous waste in the landfill. A number of lawsuits were launched. In the end, the IEB investigator concluded that the corporation had not violated regulations, however public confidence was shaken, and both the corporation's and Ministry's reputation was impacted (Bell et al. 2000). In response to this event, the MOE appointed an Expert Panel (for a period of seven months) to update both the Minister and CLC on current site operations and provide recommendations for the future (this was not a formal public inquiry). In their final report the Expert Panel outlined numerous recommendations for the government, industry and CLC to improve their operation of the Taro East and West Landfill sites.

The Taro East Landfill was registered to the ISO 14001 environmental management standard in June of 2001 (Table 4.6) (Taro Aggregates Ltd. 2002). This standard is achieved by an organization minimizing the harmful effects on the environment caused by its activities. In March 2002 the CLC distributed its final Taro report. Soon after toxic debris was dumped into the landfill and leachate was discovered leaking from the landfill. The second round of survey data was collected in June 2002.

TABLE 4.6: TIMELINE OF EVENTS (2001-2002)	
DATE	**EVENT**
2001	**East Landfill leachate pumped into regional sewer system**
5 June 2001	East Landfill Registered to ISO 14001 Standard
March 2002	Taro CLC distributed final Taro report
May 2002	Toxic debris from General Electric dumped in East Landfill
June 2002	**Leachate discovered leaking from East Landfill**
13 June 2002	***Second Round of Quantitative Data Collected***

The most significant actors in this EA process were the Ministry of the Environment (including the MOE), the corporate proponents (Taro), study and community liaison groups (the Taro Study Group and Taro Community Liaison Committee (CLC)), the community opposition group (e.g., Stoney Creek Residents Against Pollution (SCRAP)), local municipal and regional governments, and the government organizations charged with protection the local natural environment (e.g., the Hamilton Regional Conservation Authority and Niagara Escarpment Commission). The media also indirectly participated in this process by attempting to inform and/or influence public opinion.

4.4 SUMMARY

This chapter discussed the legislative, community and site contexts in which this research takes place. The legislative and site contexts provided an explanation of the EA process regarding the proposed Taro East Landfill site. The site has been a highly controversial and concern-evoking issue amongst the Stoney Creek community over time. This stemmed from: (1) the way in which key decisions were made about the site (e.g., the decision of the MOE to not hold a public hearing); (2) the occurrence of controversial issues related to the operating practices of the landfill (e.g., illegal dumping of toxic waste); and, (3) the actions by actors involved in the siting process (e.g., corruption of the Stoney Creek Council due to unethical actions). In addition, the residents of Stoney Creek had some prior (negative) experience with waste facilities due to a waste-disposal facility on the adjacent site (Taro West Landfill), also operated by Taro Aggregates Ltd.. Accordingly, the timing of this research was fundamental for the effective examination of residents' reappraisal process over time: comparing data collected during the decision-making stage (at the peak of uncertainty) to data collected after the site had been operational and residents had lived with the site in their community for a few years. This affords the opportunity to address the potential explanatory role of uncertainty in the context of a proposed landfill, an area that lacks attention in the literature.

This chapter also profiled the Stoney Creek community under study. Essentially, this is a suburban, middle class community characterized by young

families whom, for the most part, live in single-detached homes in which they are the owners. Residents in this community had access to a number of information sources including two local newspapers, public meetings and open houses, to name a few. A community opposition group, Study Group, as well as a community liaison committee were also formed to facilitate information transfer, even if this was not always the end result (Wakefield & Elliott 2000).

The contexts within which this research takes place are important in terms of Stoney Creek residents' experience of, and response to, environmental risk. These contexts are further highlighted and elaborated on in the qualitative in-depth interviews conducted with a sub-set of respondents in 2005. In the next chapter, the results of both the quantitative and qualitative analyses will be presented.

CHAPTER 5: RESULTS

This chapter presents the results of the analysis of the quantitative survey and in-depth interviews undertaken with residents of Stoney Creek, Ontario living in close proximity to the Taro East Landfill site. The Statistical Package for the Social Sciences (SPSS) was used to perform the analysis of the quantitative data, while NUD*IST was selected to facilitate analysis of the qualitative data. These results specifically address the following research objectives:

> *1. To examine residents' reappraisal of a solid waste disposal facility;*
>
> *2. To explore the role of mediating factors in the reappraisal process; and,*
>
> *3. To integrate quantitative and qualitative approaches to the research question.*

This chapter first details respondents' reappraisal process by investigating changes in the prevalence of psychosocial impacts over time. A series of site- and non-site-specific constructs were employed to guide this analysis. The first construct reported is general neighbourhood satisfaction, with a particular emphasis on respondents' satisfaction with their areas as a place to live. Perception of the landfill is the second construct reported in this chapter. The indicators used to measure this construct include issues of awareness, concern,

health-related concern and effects of concern(s) on the everyday lives of respondents. Site-related action is the third construct explored in this chapter. In addition to questions about actions specifically related to the site (i.e., whether respondents had considered moving, whether respondents had discussed concerns with friends/family/neighbours), indicators of problem- and emotion-focused coping strategies were used to measure site-related action. Next, this chapter details respondents' self-reported psychosocial health through questions pertaining to general health status, somatic complaints and stressful life events. Finally, this chapter uses logistic regression analysis to understand the characteristics of respondents more likely to report psychosocial impacts and use coping strategies (problem- and emotion-focused) in response to impacts.

The results are presented based on the methodological objective of the current research project – that is, to integrate qualitative and quantitative approaches to the research question where qualitative interviews serve to inform the interpretation of quantitative survey data. To facilitate this sort of integration, first visual displays such as tables are used to summarize the survey results and are elaborated on by descriptions. Second, direct quotations from the interviews were chosen to inform the survey results based on their illustrative quality (i.e., their ability to elaborate and enhance the survey results), explanation quality (i.e., their ability to explain findings generated by the survey results) and contextual quality (i.e., their ability to provide a contextual understanding of the survey results); respondents are identified using pseudonyms. Tables are also used to

display the interview results where appropriate. This technique is helpful in preventing narrative text from becoming cumbersome and ambiguous (Miles & Huberman 1994).

5.1 Neighbourhood Satisfaction

Ninety-six percent and 95% of respondents rated themselves as very or somewhat satisfied in both 1996 and 2002 respectively (Table 5.1). While change in satisfaction over time was not significant, it is important to note that this high level of satisfaction is typical of many neighbourhood attitude surveys (Elliott et al. 1997; Luginaah et al. 2000).

TABLE 5.1: SATISFACTION WITH AREA AS PLACE TO LIVE

1996* (n=328)	ZONE	1 (n=61)	2 (n=106)	3 (n=78)	4 (n=83)	TOTAL
	Frequency	56	99	78	81	314
	Percent	92	93	100	98	96
2002 (n=172)	ZONE	1 (n=35)	2 (n=62)	3 (n=39)	4 (n=36)	TOTAL
	Frequency	31	58	39	35	163
	Percent	89	94	100	97	95

NOTE:

[1] * p<.05

However, there is evidence of a slight variation by zone in the baseline data where it appears respondents living farther away from the site were significantly more likely to report neighbourhood satisfaction compared to respondents living closer to the site. At both points in time, residents of Stoney Creek shared similar values about their area as a place to live. They reported that their community offers the 'best of both worlds' (i.e., while the area is situated in the suburbs, the community members enjoy being close to a large urban center). They also enjoyed the 'quiet' and 'peacefulness' of the area. It is important to understand how residents characterize the meaningful aspects of their community because it speaks to what is potentially threatened by the Taro East Landfill site.

When respondents were asked what one thing they would change about their local area, a different profile emerges within the survey data (Table 5.2). In 1996, 83% of respondents reported wanting to change something about the area in which they live. This frequency significantly increased over time to 95% in 2002 ($p<.001$). There is no evidence of variation across zones for this variable. This finding indicates that while a large proportion of respondents are satisfied with the Stoney Creek area as a place to live, they are seeking an ideal environment in which to live and raise their families.

TABLE 5.2: CHANGE ONE THING ABOUT AREA

1996 (n=317)	ZONE	1 (n=60)	2 (n=104)	3 (n=76)	4 (n=77)	TOTAL***
	Frequency	53	85	59	65	262
	Percent	88	82	78	84	83
2002 (n=149)	ZONE	1 (n=31)	2 (n=54)	3 (n=33)	4 (n=31)	TOTAL***
	Frequency	30	51	31	29	141
	Percent	97	94	94	94	95

NOTE:

[1] *** p<.001

'Access to amenities' was the most frequently mentioned feature respondents would change about their local environment at both points in time (Table 5.3). This is interesting given that the rural character of the Stoney Creek attracted residents to the area. The second most frequently mentioned feature at both points in time was the landfill 'site'. Other issues mentioned included: 'physical characteristics' of the area (i.e., lack of trees); 'social characteristics' of the area (i.e., behaviour of children in the community); 'traffic'; and, 'regional politics' (i.e., wishing Stoney Creek was not amalgamated with the City of Hamilton), to name a few. This finding indicates the complexity of the many different factors that influence resident satisfaction. Not only are residents seeking an ideal environment to live and raise their families, but they are also looking for

a safe, zero-risk environment, which currently is being threatened by the landfill (Beck 1992a; 1992b). Further, when evaluating their local area of residence respondents assign the same level of priority to the landfill site when it was proposed and under operation. It would appear, in the context of the community as a whole, that the landfill posed an equal threat to the everyday lives of respondents over time (i.e., pre-and post-siting processes).

TABLE 5.3: WHAT WOULD YOU CHANGE ABOUT YOUR AREA?

RANK	1996 (n=317)		2002 (n=149)	
1	ACCESS TO AMENITIES	25% (79)	ACCESS TO AMENITIES	22% (33)
2	SITE	18% (57)	SITE	18% (27)
3	NOTHING	17% (54)	TRAFFIC	12% (18)
4	PHYSICAL CHAR'S	13% (41)	PHYSICAL CHAR'S	9% (13)
5	SOCIAL CHAR'S	7% (22)	REGIONAL POLITICS	7% (10)

The in-depth interview responses are analogous to the survey results whereby respondents reported a range of factors that they would change about their local areas physical and social environment (Table 5.4). They reported wanting to add more large trees to the area, reduce the level of traffic on the streets, and prevent the turnover of residents with whom they have built strong relationships, to name a few. However, the landfill site was the most frequently mentioned feature:

> Oh, if I could change it, I'd probably not have the dump. I was very opposed to having the dump. The West Quarry [Landfill] closed and now the East Quarry [Landfill] is open. "David", Stoney Creek, respondent.

TABLE 5.4: WHAT WOULD YOU CHANGE ABOUT YOUR AREA, IN-DEPTH INTERVIEW RESPONSES

CHARACTERISTIC	FREQUENCY (n=18)
Not have the landfill site	6
Nothing	4
High level of traffic	2
Lack of heritage aspects	2
Dwelling Characteristics	2
Poor access to amenities when first moved to area	1
The turnover of residents (i.e., loss of social networks)	1
Weather	1
Not have the drive-in theatre across street	1
High taxes	1

NOTE:

[1] numbers represent number of interviews which concept was mentioned.

5.2 PERCEPTION OF THE LANDFILL

As previously outlined, four indicators were used within the quantitative surveys to measure respondents' perception of the landfill. These include awareness, concern, health-related concern and effects of concern(s) on the everyday lives of respondents. The prevalence of each of these indicators is discussed in turn. Where appropriate, quotations are used to add meaning to these results. In addition, correlations between select measures and plausibly related

sociodemographic variables are examined as the first step towards understanding the role of mediating factors and their influence on the reappraisal process (i.e., bivariate relationships).

5.2.1 AWARENESS

Respondents were asked whether they were aware of the landfill site in their area in both the baseline and follow-up surveys. Not surprisingly, this elicited response yielded high levels of awareness at both points in time. There was no change in the overall frequency of awareness reported over time; 94% in reported site-related awareness in 1996 and 2002 (Table 5.5). These results may reflect one of a number of factors: the amount of opposition the site received; the amount of media coverage the site has received; and/or, the potential role the Taro West Landfill site played in sensitizing the community. There is no evidence of variation in awareness across zones.

TABLE 5.5: SITE-RELATED AWARENESS

1996 (n=260)	ZONE	1 (n=40)	2 (n=82)	3 (n=69)	4 (n=69)	TOTAL
	Frequency	39	76	64	64	243
	Percent	98	93	92	92	94
2002 (n=117)	ZONE	1 (n=20)	2 (n=40)	3 (n=26)	4 (n=31)	TOTAL
	Frequency	19	36	25	30	110
	Percent	95	90	96	97	94

5.2.2 CONCERN

Concern was measured using both solicited and unsolicited site-related indicators within the survey instrument. Unsolicited site concern was measured based on features of dislike volunteered by respondents about the area in which they lived. Unsolicited site concern was determined if *any* dislike mentioned was related to the site (Table 5.6). It is important to note that respondents were asked what they disliked about their local area before any mention had been made of the landfill in each data collection year. Thus, the results provide a measure of landfill perceptions that were volunteered and in context of the local area more generally.

TABLE 5.6: UNSOLICITED SITE CONCERNS (MAJOR DISLIKE)

1996** (n=328)	ZONE	1 (n=61)	2 (n=106)	3 (n=78)	4 (n=83)	TOTAL
	Frequency	22	24	10	11	67
	Percent	36	23	13	13	20
2002 (n=178)	ZONE	1 (n=37)	2 (n=62)	3 (n=43)	4 (n=36)	TOTAL
	Frequency	8	11	8	2	29
	Percent	22	18	19	6	16

NOTE:

[1] ** p<.01

There was little change in the percentage volunteering the landfill as the thing most important thing disliked about the local area; 20% volunteered the landfill as

a dislike in 1996 and 16% in 2002 (Table 5.6). However, a residual core of people continued to dislike the site. There is evidence of variation in unsolicited site concern by zone in 1996.

A similar profile emerges when the landfill site is ranked against other characteristics of the local area volunteered by respondents as a major dislike (i.e., the first mention of non-solicited concern). Table 5.7 shows the top five features not liked about the area in descending order of mention at both points in time. At both points in time, respondents assign a similar level of priority to the 'landfill site' as 'access to amenities'. While Stoney Creek provides the rural characteristics and small town atmosphere at a more affordable cost of living (See Section 4.2.3; Statistics Canada 2002; 2004), respondents do not like the trade-off and are looking for the ideal, safe, zero-risk environment in which to live and raise their families (Beck 1992a; 1992b).

TABLE 5.7: MAJOR DISLIKE ABOUT LOCAL AREA

RANK	1996 (n=290)		2002 (n=142)	
1	LANDFILL SITE	26% (75)	ACCESS TO AMENITIES	23% (33)
2	ACCESS TO AMENITIES	25% (73)	LANDFILL SITE	21% (30)
3	TRAFFIC	12% (35)	TRAFFIC	16% (23)
4	PHYSICAL CHAR'S	12% (35)	SOCIAL CHAR'S	9% (13)
5	SOCIAL CHAR'S	8% (23)	POLLUTION, GENERAL	9% (13)

When the features of volunteered dislike are ranked for the in-depth interview responses (Table 5.8), the greatest number of mentions is related to the site (but not by much).

> I'm not thrilled about Taro. I have not been since the beginning. I know they have to be someplace, but I don't think a residential area is a good idea. "Erin", Stoney Creek, resident.

This points to the importance that (spatial) equity plays in the experience of psychosocial effects. Traffic also dominated the discussions. Dislike about traffic was related to the community's close proximity to two major transportation arteries. Mud Street was identified as the main thoroughfare between the Lincoln Alexander Parkway and Highway 20 (See Figure 3.1):

> Mud Street right now is in essence the link to Highway 20. And in a planning way, you would've thought - obviously they planned this community 25 years ago; they knew what they were going to build. Why they would put a main thoroughfare right through the middle, and in essence divide whatever community was there in two and cause so much traffic within the community. "Greg", Stoney Creek, resident.

Dislike about other physical, social and financial features of the area were also discussed, but with less frequency (Table 5.8).

TABLE 5.8: NATURE OF DISLIKE, IN-DEPTH INTERVIEW RESPONSES

CHARACTERISTIC	FREQUENCY (n=18)
Landfill site	8
High level of traffic	6
The turnover of residents (i.e., loss of social networks)	4
High taxes	3
Pollution	3
Nothing	3
Threats to safety	2
Urban Encroachment	2
Poor access to amenities when first moved to area	2
Dwelling Characteristics	1

NOTE:

[1] numbers represent number of interviews which concept was mentioned.

Respondent were directly asked if they were concerned about the Taro East Landfill site to measure solicited site concern. There was little change in the frequency of respondents reporting concern over time; 66% of respondents reported concern in 1996 and 60% in 2002 (Table 5.9). This is similar to levels reported around existing and approved landfills. At Glanbrook, where a site had been operating for over 10 years, 67% of residents reported concern (Elliott et al. 1993). When the Milton site was approved, 74% of residents reported concern and 50% of respondents remained concerned after operation had begun (i.e., a significant decrease in site-related concern) (Elliott et al. 1993; 1997). This is also an important finding since at the time of the 1996 survey, the Taro East Landfill

site was not yet approved and therefore impacts experienced in 1996 may be the related to a number of factors: the Taro West Landfill; the uncertainty and anticipatory anxiety surrounding the siting process itself (e.g., Elliott et al. 1997). Furthermore, concern has characteristically been found to decrease as residents live with a landfill over time (Elliott et al. 1997), and concern did not significantly decrease over time there must be additional underlying factors influencing concern in the Stoney Creek community over time.

TABLE 5.9: SOLICITED SITE CONCERNS

1996** (n=328)	ZONE	1 (n=61)	2 (n=106)	3 (n=78)	4 (n=83)	TOTAL
	Frequency	50	71	41	56	218
	Percent	82	67	53	67	66
2002 (n=178)	ZONE	1 (n=37)	2 (n=62)	3 (n=43)	4 (n=36)	TOTAL
	Frequency	25	36	25	20	106
	Percent	68	58	58	56	60

NOTE:

[1] ** p<.01

Solicited site concern was also explored across space indicating there is evidence of variation by zone in the baseline study (Table 5.9). Frequency of reported concern decreases as distance from the site increases; 82% of respondents in the closest zone reported the site-related concern; 67% of the

respondents in zone 2; 53% in zone 3 and 67% in zone 4. As discussed previously, the timing of data collection may influence this finding since the first round of data was collected at a time when uncertainty was at a peak. Therefore, it would makes sense that residents living in closer proximity to the site (potentially perceiving greater impacts) would be more concerned than those living further away. When respondents were asked if they were concerned about the site within the in-depth interviews, 15 of the 18 respondents reported being concerned about the East Landfill site.

When respondents were asked to specify what they were concerned about for up to three mentions (Table 5.10) 'trust in Taro' (e.g., in the type/nature of waste being disposed of, company history) was the most frequently mentioned concern at baseline and 'health' was the most frequently mentioned concern at follow-up. Lack of trust in the proponent at baseline is not surprising given their company history operating the West Landfill site (i.e., leachate discovered leaking into Hamilton Harbour; illegal dumping of toxic material). Health is not a surprising concern at follow-up given that toxic material illegally entered the East landfill site after the facility opened. Respondents in the 1996 survey also elicited major concerns related to 'land values' (5%) and 'traffic' (2%). These factors were not mentioned as major concerns in 2002.

TABLE 5.10: TOP THREE MAJOR SITE-RELATED CONCERNS

RANK	1996 (n=218)		2002 (n=106)	
1	TRUST IN TARO	32% (70)	HEALTH	33% (35)
2	HEALTH	31% (68)	TRUST IN TARO	29% (31)
3	POLLUTION	17% (37)	POLLUTION	26% (28)
4	MANAGEMENT BY GOV.	6% (13)	MANAGEMENT BY GOV.	6% (6)
5	NIMBY	5% (11)	NOISE	1% (1)

The nature of the in-depth interview concerns was similar to the survey results. Several areas of concern about the landfill site were identified in the in-depth interviews (Table 5.11) including those related to nuisance, management, environment, financial, heath and uncertainty issues.

TABLE 5.11: NATURE OF CONCERNS, IN-DEPTH INTERVIEW RESPONSES

CONCERNS	FREQUENCY (n=18)
Management	14
Health	13
Uncertainty	12
Financial	7
Environmental	6
Nuisance	3

NOTE:

[1] numbers represent number of respondents that mentioned any form of the concept.

The greatest number of concerns hinged on the management aspects of the landfill site, including a perceived lack of trust in Taro and the government (Table 5.12).

TABLE 5.12: NATURE OF MANAGEMENT CONCERNS

NATURE OF CONCERN	FREQUENCY (n=18)
Lack of Trust in Taro Aggregates Inc.	12
Lack of Trust in Government	9
Lack of Communication	6
Lack of Involvement	4

NOTE:

[1] numbers represent number of interviews which concept was mentioned.

Trustworthiness of Taro stems partially from the perceived poor track record of the company prior to it operating the landfill site(s):

> I know at the time they first came in, I read all this stuff about their name, and their history, and all this kind of stuff, and none of it gave me any confidence about them as a good corporate business, or whatever you want to call it. They are there to make money. And, that's going to supercede anything that they say or do. They are there to make money. "Joann", Stoney Creek, resident.

> The main reason it was made a dump was so two brothers could make a lot of money. A lot of cash involved there. We don't trust them at all because of past events. I mean, they're all right now...they seem to be quiet because everyone has lost track of them, but they're still there. "Dan", Stoney Creek, resident.

Trustworthiness of Taro also stems from the perceived poor track record of the company with regards to their *previous* operations of the West Landfill site:

> Well, you can't tell just what's going in there. They say it's clean, but from their history [with the Taro West Landfill], you can never be sure. So sure it [trust] impacts your feelings towards them. You never know what's going in there. I mean, they say it's safe, but who knows under the cover of night just what goes in there. "Erin", Stoney Creek, resident.

> Well, there have been a few occasions that there was stuff put in it [Taro West Landfill], and they wouldn't go back to pick it up...No, I don't trust them. And then you hear that they spend $7 million dollars on soccer fields [to regenerate the land over the West Landfill]. "Scott", Stoney Creek, resident.

These concerns are also linked with health concerns about the type of material entering the site. The perceived poor track record of Taro with regards to their *current* operation of the East Landfill site also influences residents' trustworthiness of the company:

> I'll give you the main reason why I'm bitter about it. Because if you remember, there was an article in the paper about all the contaminants that were going in [the East Landfill], that weren't supposed to go into that site. I've never trusted anything that has gone into that site. And then they finally admitted about the...I believe it was mercury and the PCB's that were put in there. So if you think about it, if that's what they've admitted to, then what has been going on the whole time. I don't believe that that site really is protecting the public. I don't believe what they have done [i.e., put in a state-of-the-art liner] is proven, and no matter what they say or do, I just don't trust them. It's a matter of trust. "Trevor", Stoney Creek, resident.

These concerns were punctuated by expressions of technology mistrust. Finally, the perceived lack of communication from Taro in terms of community relations

appears to have also influenced residents' trustworthiness of the company. Respondents noted that adequate communication existed during the pre-siting process, but not during the post-siting process:

> Zero information. That's the biggest problem I have with them. The key to owning a landfill...is you have to be able to communicate with your neighbourhood as to what the landfill is actually all about. What they're doing, if there's any issues, if there's been any problems, if there's been anything, if there's any issues that we have, are there any concerns? They have never given an avenue to do that. Other than up front, obviously, because they wanted the landfill. The first year...everything is out there. Then once that happened, you never heard from them. Like they've fallen off the face of the Earth. Which is totally wrong as far as I'm concerned. I've lost trust because they've lost communication. "Bob", Stoney Creek, resident.

Another area of concern stems from the actions of the government. Trustworthiness of the government appears to be tied to respondents' perceived lack of meaningful involvement in the siting process. In particular, respondents felt that there was not adequate consideration of the possible alternatives for the land use.

> With the East dump, that one there, the reason I'm not happy with that, is I feel that the city betrayed us there. There was an opportunity to actually not make it the dump it was supposed to be, like it is now. And actually they could have turned the quarry into a regenerated quarry. I mean if you go down the Niagara escarpment, and you go to some of the quarries down by St. Catherine's way, they're turned into golf courses, and beautiful golf courses. This, I mean, maybe it could've been a golf course, probably could have. But there was a lot of betrayal there. Well, that was done politically. That's what really, really bothers me. At the time it was the City of Stoney Creek that did that, and certain politicians decided that they didn't have to listen to the people that lived around here. If they had gone to the community around here it would have never become a dump... that's if they let

> it go to hearing and truly involved the community. "Ryan", Stoney Creek, resident.
>
> Everything seemed to have been done without any regard for what the community had to say about it. The Stoney Creek council is really atrocious. "Bill", Stoney Creek, resident.

While respondents were informed about the landfill they felt they had little if any opportunity to truly influence the process. A public hearing was perceived as their only opportunity to potentially change it. In addition, the adequacy of the regulations respecting landfills was also called into question as a result of the illegal dumping events related to the Taro East Landfill. Not only did these events appear to discredit the MOE, but they also seem to have exacerbated existing concern and shaken the confidence of residents:

> Lack of trust in the agencies, and the government, the municipal government. I believe that everything that has been done is just an example of the government loopholes…I believe words are spoken to appease the public, and nothing is ever done. Well the truth about it, the actual facts, if we really knew the true facts about what has been going into that dump, most people up here would be flabbergasted, and horrified. But we'll never know. "Glen", Stoney Creek, resident.
>
> I don't think there's much rigor in place by the government checking out what's going on with Taro. "Dan", Stoney Creek, resident.

Concern about the (procedural) inequality within the siting process was also briefly discussed:

> They're [Taro] a big outfit and money talks...I think it [the siting process] was very biased. " Megan", Stoney Creek, resident.

When asked how certain respondents were that their concerns would be addressed, only 14% and 13% in 1996 and 2002 respectively were very or fairly certain that their concerns would be addressed (Table 5.13).

TABLE 5.13: HOW CERTAIN ARE YOU THAT YOUR CONCERNS WILL BE ADDRESSED?

1996 (n=198)	ZONE	1 (n=46)	2 (n=64)	3 (n=39)	4 (n=49)	TOTAL
	Frequency	3	9	7	9	28
	Percent	7	14	18	18	14
2002 (n=105)	ZONE	1 (n=25)	2 (n=36)	3 (n=24)	4 (n=20)	TOTAL
	Frequency	4	3	3	4	14
	Percent	16	8	13	20	13

A small proportion of the surveyed population felt their concerns would be addressed by the actors involved in the siting process, and a similar proportion of the re-surveyed population continue to feel this way. It is instructive to compare the actors in this EA process whom the respondents thought would address their concerns (Table 5.14). In 1996, respondents thought that the government appointed Taro community group (28%), as well as local politicians and government actors (26%) would address their concerns. A very small proportion of respondents believed industry members (3%) would deal with their concerns. The remainder (44%) was unsure which actors in the EA process would address their concerns.

TABLE 5.14: WHO WILL ADDRESS YOUR CONCERNS?		
GROUP	1996 (n=78)	2002 (n=48)
GOVERNMENT/ POLITICIANS	26% (20)	23% (11)
COMMUNITY GROUP	28% (22)	2% (1)
INDUSTRY	3% (2)	0% (0)
NOTE: [1] significant change in incidence over time, p<.001		

While respondents still acknowledged that their concerns would be addressed by local politicians and government actors in 2002 (23%), their faith in the community group to address their concerns significantly declined over time (2%) (Table 5.14). This can be attributed, in part, to the lack of opportunity for public participation in the post-siting process. Not only were there fewer meetings and open houses, but also the original Taro community liaison committee (CLC) no longer existed. The Taro Neighbourhood Liaison Committee (TNLC) has more recently replaced the CLC, however, TNLC meetings are not open to the public. In addition, respondents did not believe industry members would address their concerns in 2002 (0%).

The above feelings about Taro appear to be exacerbated by the fact that respondents feel the company has little or no true regard for the concerns of the community (i.e., agenda driven):

> I'm sure whatever they say they will protect their landfill. If you own the place, you're going to be protecting it. Like it's a business.

> So there's always going to be a trust issue. "Debbie", Stoney Creek, resident.

> It's hard today, until you know people's agendas you can't always take it for face value why they're doing it and what their doing. "Sally", Stoney Creek, resident.

This overall lack of trust intensifies the nature of other areas of concern for respondents since they are not confident problems will ever be resolved. This uncertainty emerged as a theme in the in-depth interviews, particularly related to the type of material entering the Taro East Landfill site. Subsequent concerns are therefore related to mysterious occurrences throughout the community, such as farms closing down.

> Just the fact that you don't know what they [Taro] are putting in it [the East Landfill]. I believe that there is a farm down there…that went under. And, I'm not sure whether he just got tired of it or whether he doesn't have the farm anymore because of the landfill…but I noticed he was gone. And what's the reason behind that? "Tom", Stoney Creek, resident.

> I am concerned with the fact that, you've heard rumors and you've heard the indications that there has been material brought into the landfill that wasn't necessarily approved to be brought in. "Bob", Stoney creek, resident.

The compensation packages offered by Taro to certain households was another concern discussed in the in-depth interviews. Again, respondents highlight the issue of uncertainty:

> And we were also told too that the houses that back onto Mud were given like $5,000 each…those residential properties. And that kind of brought up concern. Because actually, look-wise, aesthetic-

> wise it [the site] looks better than it did before. So why are they receiving compensation? Why are they getting $5,000 unless there is something going on? "Wendy", Stoney Creek, resident.

The respondents also identified the uncertainty attached to the future operations of the landfill. At the time of the in-depth interviews there was substantial media coverage on the issue of banning shipments of Toronto's trash to Michigan (currently Toronto ships its trash to a landfill in Michigan, City of Toronto 2006). Respondents considered the potential for Toronto's trash to be disposed of in the Taro East Landfill site. Respondents saw this uncertainty as a reason for concern.

> And you know there's Toronto talking about, "Well Michigan is going to ban our garbage. And we've got to put it someplace because we can't put it in our own area. So we have to find some place else to dump it." And I mean Taro is a company that's looking for money. "Bill", Stoney Creek, resident.

Respondents also discussed financial concerns. These include concerns about potential effects on property values, as well as stigmatization. Perceived concern over property values highlights the attachment residents have to their property and the difficulty of selling their home in the event of contamination.

> I think that people…if that ever comes out – and I know darn well it's going to happen – do you think that someone's going to want to buy my house! What about people near the Ottawa Street Landfill site…nobody wants to buy there. Land values is important, because I mean if people want to get out of here before anything hits the fan. "Trevor" Stoney Creek, resident.

Linked to concerns over property values is the effect of stigmatization:

> It still affects this area I believe because it's hard to dissipate rumors. People still say "oh ya, they said it wasn't true," but they [rumors] impact people and attitudes…and once you're labeled, it's stuck. "Wendy", Stoney Creek, resident.

Regardless of whether or not illegal events related to the landfill site actually occurred, the effect of stigmatization is said to impact the community and residents' way of life and worldviews. Other concerns revolve around possible damage to the natural environment through pollution, primarily leachate, from the landfill:

> When I think of Taro, I think of chemical and solid waste. I mean the old Ottawa Street dump I understand was used as a chemical dumping ground for years, and there's not too many things that grow, or live in the creek…in the Red Hill Valley creek. Potentially it could do the same thing at Taro I suppose, but time will tell. "Tom", Stoney Creek, resident.

The potential for pollution from the site to affect water quality was another commonly mentioned environmental concern:

> You've still got it [leachate] pouring down the mountain, and it's getting into our lake, and it's coming back up in our water. "Joann", Stoney Creek, resident.

Residents were concerned about water quality and the potential for health impacts, despite their use of city water. Environmental concern also stemmed from proximity of the site to the Niagara Escarpment. These concerns are linked to (spatial) equity and respondents' lack of trust in the government.

> Putting it on the escarpment and having to put on a plastic whatever they did, to stop the leaching, because of it running into the Red Hill Valley and into our water, I think they could have

> maybe picked a better spot. I mean it's a very poor choice of putting that kind of facility. Especially when within, what, 500 meters, you have a biosphere that's protected by the United Nations. I mean like, what were they thinking? "Ryan", Stoney Creek, resident.

These concerns appear to indicate mistrust in the landfill safety measures and the adequacy of the landfill regulation regime. Finally, concerns also hinged on the nuisance aspects of the landfill site, including increased traffic, noise and the projected height of the site. Concerns about traffic dominated the discussion of the possible nuisance effects:

> Highway 20 is extremely congested because of all the truck traffic coming up through the dump. "Scott", Stoney Creek, resident.

Concerns about the visual appearance of the landfill were also mentioned:

> I think the projection of the finished height is too high. I would like it to be lower so it would not be so obvious what it is. "Jane" Stoney Creek, resident.

These issues identified in the previous section not only recognize present concerns about the landfill site (i.e., traffic, communication, involvement) but also future concerns related to visual appearance, pollution, trust and uncertainty.

Despite the prevalence of concern, residents did offer a few positive perceptions of the landfill such as the community benefits Taro (through their Community Trust Grants and recreational facility) have contributed to the City of Stoney Creek. These positive perceptions were not captured in the quantitative analysis. However, some respondents were quick to note the problems with these benefits.

> Well I think it has done a few things in the community as far as providing money to funds. I think they came up with an agreement to give 'X' number of dollars to the community. Which provides the community with things. And right now we do have a huge sports facility built there. "Wendy", Stoney Creek, resident.

> I was the president of the basketball association up there. They did donate $5,000 towards basketball, but that's because we all live within 3km's of the dump. "Scott", Stoney Creek, resident.

> Actually, this park that just opened. And it's really big, you know. And it's something we've needed up here, because as I said, we don't get a lot of those things put in. And it was a thing of having to share with the school, so that was really beneficial. "Sally", Stoney Creek, resident.

5.2.3 Health-Related Concern

While there were references to health when respondents were asked to specify the nature of their site concerns in general, when asked explicitly if they considered their concerns to be health-related there is a significant increase in the frequency of respondents reporting health-related concerns over time, from 56% of respondents reporting health concern in 1996 to 65% in 2002 ($p<.05$) (Table 5.15). This can be attributed, in part, to the facility-related events and how they threaten residents' core values. Between the baseline survey in 1996 and the follow-up survey in 2002 several notable, and potentially concern evoking events occurred, including the illegal dumping of hazardous waste into the site, the discovery of leachate leaking from the site, as well as the proposal to dump the leachate into the public sewer system. The level of health-related concern

reported at Taro is higher than any other study (e.g., 21% at SWARU; 49% at Glanbrook; 50% at the approved Milton site; 36% at the operating Milton site; Elliott et al. 1993; 1997). The increased incidence of health-related site concerns (Table 5.15) may also be an important factor in reported site-related concerns more generally (Table 5.9). The in-depth interviews disclose a similar profile whereby the second most frequently mentioned concern was related to health issues (Table 5.11).

TABLE 5.15: HEALTH-RELATED SITE CONCERNS

1996* (n=328)	ZONE	1 (n=61)	2 (n=106)	3 (n=78)	4 (n=83)	TOTAL*
	Frequency	43	58	36	46	183
	Percent	71	55	46	55	56
2002 (n=178)	ZONE	1 (n=37)	2 (n=62)	3 (n=43)	4 (n=36)	TOTAL*
	Frequency	27	40	27	22	116
	Percent	73	65	63	61	65

NOTE:

[1] * p<.05

Health-related concern was also analyzed across space and a gradient effect is seen in the 1996 data; respondents living in closer proximity to the site (potentially experiencing greater impacts) are more likely to report health-related

concern than respondents living farther away. However, this gradient disappeared in 2002 indicating that residents uniformly perceived there to be a risk of possible future health impacts from the landfill, independent of location.

In addition, respondents were asked to specify their health-related concerns allowing up to three mentions (Table 5.16).

TABLE 5.16: TOP THREE MAJOR HEALTH-RELATED SITE CONCERNS

RANK	1996 (n=183)	2002 (n=116)
1	SHORT-TERM HEALTH (i.e., rash, headaches) 51% (93)	LONG-TERM/ FUTURE HEALTH (i.e., cancer, respiratory disease) 28% (33)
2	DO NOT KNOW 21% (38)	DO NOT KNOW 19% (22)
3	LONG TERM/ FUTURE HEALTH (i.e., cancer, respiratory disease) 20% (37)	SHORT TERM HEALTH (i.e., rash, headaches) 11% (13)

The principle health-related concerns about the landfill in 1996 included rashes and headaches. In 2002, respondents were concerned primarily about cancer and respiratory disease (dread impacts). This finding represents a shift in the nature of the health-related site concern over time; the majority of the reported health-related site concerns were short-term in nature in 1996, while in 2002 were long-term. This may reflect the site history of the Taro East Landfill site whereby it appears that respondents perceive their health and well being to be potentially

impacted by the high profile events which occurred between the data collection years (e.g., illegal dumping of toxic waste, leachate discovered leaking from the site). Respondents not only seem to recognize the likelihood of negative health impacts in the in-depth interviews but also the uncertainty attached to estimates of health outcomes:

> Again, cause you're not sure what has been put in there, what the impact will be, and that's a long-term thing unfortunately. It may not be affecting anyone right now, but maybe in the future. "Ken", Stoney Creek, resident.

> When the garbage hits the fan, like 20 years from now, and they find out medical information about the people who are downstream from 'you know', at the edge of the escarpment, a 30% increase in cancer or something like that. Then they'll start backtracking, and they'll go, "We found the problem." "Bill", Stoney Creek, resident.

In addition to health concerns about Taro's current operations, respondents also express concern for the recreational facility built on the regenerated land from the Taro West Landfill site:

> Serious doubts. Would I want my children playing on that land when we haven't gotten a clue what's underneath it. It's the same as the garbage dump over here on Stone Church. I wouldn't want my kids on top of that, and I wouldn't want them playing over here [at the Taro recreational facility] either. Now see, I also happen to know the family that had to move from their dream home on Rymal Road because of what has leaked out of that [West Landfill] into their property, and made them ill. Respiratory issues for the one child, skin rashes for the other. "Joann", Stoney Creek, resident.

Respondents were also asked if their site-related concern(s) were having or likely to have any affect on their everyday life. The number of respondents

reporting effects (and anticipated effects) on daily life significantly decreased over time, from 30% in 1996 to 19% in 2002 ($p<.01$) (Table 5.17). Effects on daily life were also explored across space indicating there is evidence of variation by zone at baseline ($p<.01$). Respondents in the closest two zones reported effects on daily life more than those in the farthest two zones; thirty-nine percent of respondents in the closest zone reported effects on daily life; 37% of the respondents in zone 2; 18% in zone 3 and 24% in zone 4.

TABLE 5.17: EFFECT ON DAILY LIFE

1996** (n=328)	ZONE	1 (n=61)	2 (n=106)	3 (n=78)	4 (n=83)	TOTAL**
	Frequency	24	39	14	20	97
	Percent	39	37	18	24	30
2002 (n=178)	ZONE	1 (n=37)	2 (n=62)	3 (n=43)	4 (n=36)	TOTAL**
	Frequency	7	12	7	7	33
	Percent	19	19	16	19	19

NOTE:

[1] ** p<.01

The most frequently mentioned effect on daily life was related to 'health' at both points in time (Table 5.18). Heath effects on everyday life included the uncertainty of future health impacts, asthma, illness in children, worry and stress.

TABLE 5.18: TOP THREE EFFECTS ON DAILY LIFE

RANK	1996 (n=95)		2002 (n=32)	
1	HEALTH	58% (55)	HEALTH	56% (18)
2	PROPERTY VALUES	13% (12)	ENVIRONMENT	16% (5)
3	ENVIRONMENT	12% (11)	PROPERTY VALUES	13% (4)

The in-depth interview responses reveal a community that is concerned about the possible future health impacts in their everyday lives (Table 5.19).

> I don't think about it every day. But from time-to-time you think, '[x!#@!], what is sitting in that landfill?" "Debbie", Stoney Creek, resident.

One respondent discussed how the landfill site affected his daily life more when it operated as a quarry (quarry operations ceased in 2001):

> It was more of an issue when it was a quarry because of the blasting. You couldn't hang clothes out here. We used to run off the cistern, like right off of the roof, and we'd have build up on our sinks and stuff like that, just from the limestone dust. "Glen", Stoney Creek, resident.

The shift in the nature of the effects on daily life appears to be concomitant with the shift in the nature of the health concern. As residents live with the Taro East Landfill site they are more concerned about the long-term effects of exposure. This substantiates, in part, previous suggestions of the role of uncertainty in the reporting of psychosocial effects (Elliott et al. 1997; Wakefield & Elliott 2000).

TABLE 5.19: NATURE OF EFFECTS ON DAILY LIFE	
FEATURE	FREQUENCY (n=18)
Possible future health impacts	11
More Concerned About Other Things	3
Daily Annoyance	3
Other (i.e., Worse when was a quarry)	1
NOTE: [1] numbers represent number of interviews which concept was mentioned.	

5.2.4 At-Risk Profiles

Correlations between a range of sociodemographic variables and concern, health-related concern, as well as effects on daily life are examined as the first step towards understanding the role of mediating factors and their influence on the reappraisal process. In so doing, an attempt is made to build at-risk profiles of vulnerable groups.

The bivariate analysis between solicited site concern in 1996 and select sociodemographic variables indicates that concern was associated with higher income (44% <$30,000, 69% ≥ $30,000); higher education (69% ≥ High school, 53% < High school); full-time employment (57% Other; 73% Full-time employment); and, closer proximity to the site in terms of zone (82% zone 1, 67% zone 2, 53% zone 3, 67% zone 4) (Table 5.20). In 2002, the correlate was home ownership (31% Rent, 63% Own). There are a few points to be made from these

analyses. First, in terms of exposure, distance from the site was a significant variable during the pre-siting process, but not during the post-siting process. Second, individual factors were strong predictors of concern in Stoney Creek. Third, respondents with higher socioeconomic status were more likely to be concerned about the landfill site in 1996. Finally, dwelling tenure in 2002 appears to be important in terms of the retention of concern over time.

Health-related concern in 1996 was associated with higher income (32% < $30,000, 58% ≥ $30,000), full-time employment (47% Other, 63% Full-time employment), and living in a detached dwelling (43% Attached, 58% Detached). In 2002, the correlate was age, where as age increases health-related concern increases (Table 5.21). As with concern, individual variables are strong determinants of health concern. Respondents with higher socioeconomic status were more likely to express health-related concern towards the landfill site during the pre-siting process. However, age seems to be an important factor in the retention of the outcome. One explanation might be age increases ones vulnerability to health risk, as so we are more concerned about potential threats (Health Canada 1997). In addition, a study on stress suggests a heightened reactivity to stressors in older adulthood (Mroczek & Almeida 2004).

Based on the 1996 data, the bivariate correlates between effects on daily life and sociodemographic variables indicates that reported/anticipated effects on daily life was associated with being older, higher income (12% < $30,000, 29% ≥ $30,000), closer proximity to the site (39% zone 1, 37% zone 2, 18% zone 3, 24%

zone 4), and closer distance to the site (Table 5.22). In 2002, the correlate was dwelling type, where respondents living in detached houses reported more effects on daily life (4% Attached, 21% Detached). These analyses suggest exposure variables are strong determinants of perceived effects on daily life in the pre-siting process. Both zone and distance from the site are important factors. Second, individual variables are also important determinants of perceived effects on daily life. In particular, dwelling type is an important factor in the retention of the outcome over time.

These results acknowledge that different factors influence the experience of psychosocial effects in the pre- and post-siting processes. While socioeconomic status and distance from the site influenced the experience of psychosocial effects during the pre-siting process, dwelling tenure, type and age were important characteristics for the retention of these outcomes in the post-siting process. The logistic regression models will further explore this issue (Section 5.5).

TABLE 5.20: RELATIONSHIPS[1] BETWEEN SOCIODEMOGRAPHIC CHARACTERISTICS AND CONCERN

	1996	2002
GENDER	X^2=.008	X^2=.132
AGE	t=1.013	t=.001
MARITAL STATUS	X^2=-.083	X^2=-.087
CHILDREN <17YRS	X^2=-.001	X^2=-.009
INCOME	X^2=-.183**	X^2=-.203
EDUCATION	X^2=-.119*	X^2=-.105
EMPLOYMENT	X^2=.168**	X^2=.033
DWELLING TENURE	X^2=.106	X^2=.173*
DWELLING TYPE	X^2=.046	X^2=.114
ZONE	X^2=-.113*	X^2=-.071
DISTANCE FROM SITE	t=-.1992	t=-1.488
LENGTH OF RESIDENCE AT CURRENT ADDRESS	t=-.471	t=-.288
LENGTH OF RESIDENCE IN AREA	t=.701	t=-.342

NOTES:

[1] * p<.05

** p<.01

TABLE 5.21: RELATIONSHIPS[1] BETWEEN SOCIODEMOGRAPHIC CHARACTERISTICS AND HEALTH CONCERN

	1996	2002
GENDER	X^2=-.028	X^2=-.102
AGE	t=1.271	t=2.153*
MARITAL STATUS	X^2=.070	X^2=.001
CHILDREN <17YRS	X^2=.014	X^2=.074
INCOME	X^2=-.181*	X^2=-.031
EDUCATION	X^2=-.092	X^2=-.064
EMPLOYMENT	X^2=.156**	X^2=.058
DWELLING TENURE	X^2=.090	X^2=.030
DWELLING TYPE	X^2=.111*	X^2=.170
ZONE	X^2=-.099	X^2=-.033
DISTANCE FROM SITE	t=-1.744	t=-.276
LENGTH OF RESIDENCE AT CURRENT ADDRESS	t=-.699	t=-.910
LENGTH OF RESIDENCE IN AREA	t=-.393	t=-.356

NOTES:

[1] * p<.05

** p<.01

TABLE 5.22: RELATIONSHIPS[1] BETWEEN SOCIODEMOGRAPHIC CHARACTERISTICS AND EFFECTS ON DAILY LIFE

	1996	2002
GENDER	X^2=-.062	X^2=-.087
AGE	t=2.195*	t=1.087
MARITAL STATUS	X^2=-.097	X^2=-.066
CHILDREN <17YRS	X^2=.048	X^2=.022
INCOME	X^2=-.134*	X^2=-.267
EDUCATION	X^2=-.084	X^2=-.001
EMPLOYMENT	X^2=.027	X^2=.021
DWELLING TENURE	X^2=.014	X^2=.081
DWELLING TYPE	X^2=.029	X^2=.151*
ZONE	X^2=-.152**	X^2=-.006
DISTANCE FROM SITE	t=-2.184*	t=-.441
LENGTH OF RESIDENCE AT CURRENT ADDRESS	t=-1.368	t=-1.659
LENGTH OF RESIDENCE IN AREA	t=-.438	t=-.294

NOTES:

[1] * p<.05

** p<.01

5.3 SITE-RELATED ACTIONS

Site-related action was first measured by asking respondents whether or not they had participated in a series of actions specifically related to the site. Next, indicators of problem- and emotion-focused coping strategies were used to measure site-related action. Problem-focused coping indicators include behavioural actions taken in response to site concern(s). Emotion-focused coping indicators include cognitive actions taken in response to site concern(s).

5.3.1 SITE-RELATED ACTION

Respondents were asked if they had ever considered moving as a result of the landfill site. There was a small change in the frequency of reporting over time; 30% considered moving in 1996 and 31% in 2002 (Table 5.23).

TABLE 5.23: CONSIDERED MOVING BECAUSE OF SITE

1996 (n=216)	ZONE	1 (n=49)	2 (n=71)	3 (n=40)	4 (n=56)	TOTAL
	Frequency	15	26	9	14	64
	Percent	25	25	12	17	30
2002 (n=172)	ZONE	1 (n=35)	2 (n=62)	3 (n=39)	4 (n=36)	TOTAL
	Frequency	9	22	12	10	53
	Percent	25	36	31	28	31

This finding may reflect a trade-off: potentially more positive aspects of the local area overshadow the negative aspects of the landfill site.

> We were thinking about it. But, just because of the dump, well we have other obligations in life, so we can't just move out right now. "Debbie", Stoney Creek, resident.

There was no evidence of a gradient when this indicator was examined across space.

Respondents who considered moving because of the landfill site were also asked if they actually took steps towards moving. In 1996, 24 of the 64 respondents who had considered moving because of the site actually took action (e.g., discussed moving (12); looked (1)). In 2002, 10 of the 53 respondents who had considered moving because of the site took action (e.g., looked (2); contacted an agent (3); tried to rent or sell (2)). The incidence of action significantly decreased over time from 38% in 1996 to 19% in 2002 ($p<.05$). There is no evidence of variation by zone in either case.

In addition, respondents were also asked a series of other questions specific to site-related action (Table 5.24):

- Have you read about the (proposed) site in the newspaper?
- Did you read any of the Environmental Assessment documents prepared as past of the application process for approval of the landfill?
- Have you discussed the (proposed) site with friends or neighbours?
- Have you attended a public meeting organized by government or industry officials related to the (proposed) site?

- Have you attended a meeting organized by the local citizens groups at which the (proposed) site was discussed?

- Have you telephoned, written or spoken to politicians and/or government staff about your concerns regarded the (proposed) site?

- Have you spoken to staff at Taro or Phillips about your concerns related to the (proposed) site?

TABLE 5.24: SITE-RELATED ACTION

ACTION	1996 (n=310)	2002 (n=165)
Read in newspaper	81% (251)	87% (135)
Read technical documents	45% (140)	42% (69)
Discussed site with friends/family/neighbours	62% (192)	65% (107)
Attended meetings organized by officials	19% (59)	22% (36)
Attended meetings organized by citizens	27% (84)	22% (36)
Contacted government/ politicians	28% (87)	27% (45)
Spoken to Taro Staff	18% (56)	11% (18)

For each question, there was little change in the frequency reporting action over time (Table 5.24). Well over half the respondents reported reading about the site in the newspaper in both the baseline (81%) and follow-up (87%) surveys. The two local newspapers, The Stoney Creek News and the Hamilton Spectator, were the most frequently mentioned sources of information about the site in the in-depth interviews as well. All 18 respondents reported the newspaper as their main source of information. Respondents reported reading the Taro newsletter when they received it, but referred to it as a biased source of information:

> I get information when they send us their little newsletter. Telling us how great they are. I glance at it. I figure it's propaganda, and I let it go. "Ken", Stoney Creek, resident.

Sixty-two percent in 1996 and 65% in 2002 reported discussing their concerns with friends/family/neighbours. This indicates that social support (kinship and friendship networks) may be a key factor in the coping response (Berger & Luckman 1966; Edelstein 1988; Eyles et al. 1993). Respondents referred to the importance of the shared or collective experience:

> I guess is just gives me a chance to get it off my chest. You know that's all it is really. And you're anticipating that if it's people who felt the same way that you have felt in the past, that you're still allowed to feel that way. "Sally", Stoney Creek, resident.

However, the rapid growth of the community was one explanation offered by respondents for talking *less* with their neighbours and family about the site over time (Table 5.25). This substantiates the importance of the collective and shared experience in both the experience of environmental stress as well as the coping response:

> Well I used to talk about it quite often eh. But now we have a few new neigbours in that don't have a clue what's going on, and I haven't told them. "Trevor", Stoney Creek, resident.

> In our general area here, all the neighbours here are switched. They're all newer, so they don't know the history. "Megan", Stoney Creek, resident.

Just less than half the respondents reported reading the technical document related to the site in the baseline (45%) and follow-up (42%) surveys. However, the

percentage of the sample groups reporting actions taken in response to site concerns was low for the remainder of the variables (i.e., contacting the government, addressing Taro, attending meetings). These trends continued throughout the in-depth interviews with respondents reporting taking more site-related action in the beginning of the siting process (Table 5.25).

TABLE 5.25: SITE-RELATED ACTION, IN-DEPTH INTERVIEW COUNTS (n=18)

ACTION	YES	NEVER	IN BEGINNING
Considered Moving	3	15	0
Discuss with Friends/ Family/ Neighbours	2	3	13
Attend Community Meetings	1	6	11
Contact Government/ Politicians	0	15	3

This is not surprising given that residents have expressed mistrust of these actors (See Section 5.2.2). These strained relationships were exacerbated by the actors' perceived lack of regard for community concerns (See Section 5.2.2).

> Useless endeavor as far as I'm concerned. I don't trust them [Taro]...including the government. "Dan", Stoney Creek, resident.

> They said that they'd set up this committee, and it'd be a quasi-company and impartial committee. But it never could function, because the citizen part had no influence on the company. They were going to do what they wanted to do. "Ryan", Stoney Creek, resident.

Lack of attendance at community meetings can be attributed, in part, to residents' perceived lack of opportunity for meaningful involvement in the siting process.

> I use to go to the meetings when it was a bunch of angry men arguing with each other. I would leave cause I was there to get information and they were yelling. I think these people had political agendas. I just felt that my time was wasted in those meetings. People were yelling obscene things and nasty words and not conducting an orderly information session. "Jane", Stoney Creek, resident.

> I'm watching the person going up an escalator at these meetings, and the escalator is never-ending. It's never going to take you to the top, and you're never going to get anything accomplished. I think that's a frustrating battle. This is why I stopped going. I think they are never going to clean that [East landfill] site up. All they are trying to do is say, 'Look, we've got to make sure it's not going to harm anybody.' It shouldn't have been done in the first place what they did but industry in this country, and around Southern Ontario, has so much power, but environmentally they just won't spend the money because it costs too much to begin with. Especially about the unknown. So what do they do? They just do what they do, and when they get caught then the propaganda machine goes into effect. "David", Stoney Creek, resident.

While respondents noted the opportunity to get involved through the community meetings, many felt this was only superficial participation and that the public had little, if any, opportunity to truly influence the process or provide meaningful input. Thus, residents appear to feel there was not enough opportunity to participate in a *meaningful* way. This distinction between participation and

meaningful participation is a critical one, especially in the case of Stoney Creek where, despite their concerns, the landfill site was approved without an EA hearing.

5.3.2 Problem- and Emotion-focused Coping

Site-related actions were also measured by addressing a series of dichotomous emotion- and problem-focused coping questions based on the stress and coping framework outlined by Lazarus and Folkman (1984).

TABLE 5.26: PROBLEM-FOCUSED QUESTIONS
Have you found yourself doing any of the following as a way to deal with the issue [landfill site]:
1. Tried to get the people responsible to change their minds.
2. Talked to someone to find out more about the situation.
3. Made a plan of action and followed it.
4. Talked to someone who could do something concrete about the problem.
5. Stood your ground and fought for what you wanted
6. Tried to come up with a couple of different solutions to the problem.

TABLE 5.27: EMOTION-FOCUSED QUESTIONS

Have you found yourself doing any of the following as a way to deal with the issue [landfill site]:

1. Turned to other work activities.

2. Just hoped something would happen to make it the whole situation go away.

3. Went on as if nothing happened

4. Told yourself you probably wouldn't even notice the landfill there.

5. Kept your feelings to yourself.

6. Told yourself the landfill would probably be managed safely and effectively.

7. Told yourself that other communities with industrial waste landfills have not experienced any health or environmental problems.

8. Talked to someone about how you were feeling.

9. Told yourself that your community will probably not be affected by the landfill.

10. Just accepted it, since nothing could be done about it.

11. Just didn't let it get to you.

12. Wished it would all just be over with.

This determined to what degree each respondent employed each strategy. Responses indicated that several techniques were used as a form of coping. Table 5.28 illustrates the incidence of reporting for both strategies. At both points in

time, emotion-focused strategies were employed significantly more than problem-focused strategies ($p<.001$). In addition, the incidence of problem-focused strategies (i.e., action) significantly decreased over time ($p<.01$), from 49% of respondents employing problem-focused coping strategies in 1996 to 36% in 2002.

TABLE 5.28: EMOTION- AND PROBLEM-FOCUSED ACTION

ACTION	1996*** (n=328)	2002*** (n=178)
Problem-focused **	49 (161)	36 (64)
Emotion-focused	66 (215)	60 (106)

NOTE:

[1] ** p< .01

*** p<.001

Emotion-focused coping strategies dominated the in-depth interview responses, including cognitive strategies such as avoidance, minimization, distancing, giving up, rationalization, suppression and deriving a positive outcome from a negative situation. Respondents expressed 'turning inwards' as a way of separating their concerns from the routine of everyday life (Beck 1992a).

> I think there does come to a point where I think you just put it down. You get tired of the negative, and dwelling on it and thinking of it. And there is just hope that no one's health is at risk. "Megan", Stoney Creek, resident.

A number of respondents dealt with the stressful situation by compartmentalizing the issue- that is, focusing on more important issues in their everyday lives. Dealing with adverse situations in this manner is what Lazarus and Folkman (1990) refer to as distancing.

> You know what, we've got better things to do then to spend our time on it because I don't think anyone's concerns are ever met. I am aware that the problem is there...but I don't loose sleep over it. I'm not going to put a for sale sign on my lawn tomorrow to get out. "Megan", Stoney Creek, resident.

Others explained their adaptation to the landfill to be the result of the situation not being as high profile as it once was. Lazarus and Folkman (1990) categorize this form of coping as denial. That is, the residents have changed the relational meaning of what is happening so stress is mitigated even though the actual conditions have not changed.

> It's not in the newspaper every time you turn around. I mean initially, every time you picked up the paper it was about Taro, it was about SCRAP...that they want to get rid of it [the landfill]. So when things are not as out there in your face. "Joann", Stoney Creek, resident.

Other respondents attempted to rationalize the stressful situation to justify their perceptions. This form of coping can be characterized in a number of ways: selective attention; wishful thinking; resignation; sustained optimism (Lazarus & Folkman 1984; Beck 1992a). This is a means of coping whereby respondents relinquish power to 'experts', regardless of their credibility, and trust that these

experts will protect them from negative consequences (Beck 1992a). Not surprisingly, sustained optimism is indicated by blind trust in expert opinion:

> I think that basically we have a blind faith that the government is watching Taro, and Taro is trying to keep in like with the government guidelines, and we are assuming that that's happening. What else can we do? We don't have any control over it. 'Erin", Stoney Creek, resident.
> But what I am saying is, you know, I trust the government and trust the environment people, that they are keeping an eye on it for us, and for everybody. If they are keeping a close eye on it, I've got nothing to say. "David", Stoney Creek, resident.

> They went through all the regulations. So if they did that, and the complied with the rules, then I have to have some level of confidence in our government, and the people that are inspecting things too. "Sally", Stoney Creek, resident.

> Honestly, you know it's just not something I think about. I hope they're doing a good job out there, but, I mean, I guess they need to, right? "Greg", Stoney Creek, resident.

Once again, uncertainty underscores this strategy. Alternatively, some residents derived a positive outcome out of a negative situation by comparing the situation to issues they feel are more detrimental.

> It's really out of sight, out of mind. Other things bother me more, like hydro lines and stuff like that. Like you know, I would definitely not live under hydro lines. The landfill, I guess, some of my friend's even work on it or whatever. "Glen", Stoney Creek, resident.

Various residents developed a defeatist response to the issue.

> It's just tired news after a while. Because there's nothing we can do about it. Then after a while you just start re-hashing the same old stuff. And there's always something new that comes along, and takes its place. "Greg", Stoney Creek, resident.

> I guess for lack of a better term, boredom. It's just there, and there's not much I can do about it. "Ken", Stoney Creek, resident.

> To be quite honest with you, other than the fact that people in the media bring it up, I don't even think about it anymore. Once it was decided on there was nothing I could do about it. We don't have the power. Most of us just turn a blind eye to everything, and we assume that everything is going the right way. "Tom", Stoney Creek, resident.

This response is referred to by Beck (1992a) as *pragmatic acceptance* and was adopted by respondents who felt a sense of powerlessness with respect to the process. As the literature indicates, this coping strategy is influenced by the extent to which a stressful situation is considered difficult to change or uncontrollable. Lazarus and Folkman (1990) categorize this way of thinking as avoidance. Other emotion-focused techniques included minimizing the situation.

> I live close to this particular dump, but there are many other things going on in the city...I am as unhappy about many other things as I am about that. "Ryan", Stoney Creek, resident.

Generally residents can preserve their old reality by either denying the (potential) implications of the issue or moving on with their lives by withdrawing into everyday life. This withdrawal into everyday life could be seen as an attempt to preserve one's ontological security and, thus, protective cocoon (Giddens 1990).

5.3.3 At-risk Profiles

To determine if any sociodemographic characteristics were related to the type of coping strategy employed in response to site concern a series of bivariate analyses was conducted. In 1996, the bivariate correlates of emotion-focused coping strategies indicate that emotion-focused coping was associated with higher income (44% < $30,000, 68% ≥ $30,000), higher education (68% ≥ High school, 53% < High school), full-time employment (57% Other, 72% Full-time employment), and closer proximity to the site in terms of zone (82% zone 1, 66% zone 2, 50% zone 3, 67% zone 4) (Table 5.29). In 2002, the correlate was home ownership (31% Rent, 63% Own). These analyses indicate that during the pre-siting process both individual and socioeconomic characteristics are strong predictors of the emotion-focused coping response. This also points to the importance that distance from the site plays in the coping response. However, dwelling tenure appears to be an important variable in understanding the retention of emotion-focused coping over time.

In 1996, the bivariate correlates of problem-focused coping strategies indicate that problem-focused coping was associated with higher income (27% < $30,000, 50% ≥ $30,000), full-time employment (40% Not Full-time, 56% Full-time employment), and dwelling type (51% Detached; 35% Attached) (Table 5.30). In 2002, the correlate was gender (29% Female, 44% Male), where by males were more likely to employ problem-focused coping strategies (Table 5.30). Again, socioeconomic status appears to be a strong predictor of the coping

response in the pre-siting process. However, dwelling tenure was also an important variable in understanding coping during this stage of the process as well. In the context of the post-siting process, gender was a key factor in the retention of the problem-focused coping response.

Overall, these findings indicate that socioeconomic status is a key factor influencing the coping response during the pre-siting process, while dwelling tenure and gender were important characteristics for the retention of this adjustment. The logistic regression models will further explore this issue (Section 5.5).

TABLE 5.29: RELATIONSHIPS[1] BETWEEN SOCIODEMOGRAPHIC CHARACTERISTICS AND EMOTION-FOCUSED COPING STRATEGIES IN RESPONSE TO SITE CONCERNS

	1996	2002
GENDER	X^2=.013	X^2=-.132
AGE	t=1.036	t=.001
MARITAL STATUS	X^2=.085	X^2=.087
CHILDREN <17YRS	X^2=.013	X^2=-.009
INCOME	X^2=-.175**	X^2=-.203
EDUCATION	X^2=-.110*	X^2=-.105
EMPLOYMENT	X^2=.163***	X^2=.033
DWELLING TENURE	X^2=.099	X^2=.173*
DWELLING TYPE	X^2=.037	X^2=.114
ZONE	X^2=-.115*	X^2=-.071
DISTANCE FROM SITE	t=-1.988	t=-1.488
LENGTH OF RESIDENCE AT CURRENT ADDRESS	t=-.387	t=-.288
LENGTH OF RESIDENCE IN AREA	t=-.801	t=-.342

NOTES:

[1] * p<.05

** p<.01

*** p<.001

TABLE 5.30: RELATIONSHIPS[1] BETWEEN SOCIODEMOGRAPHIC CHARACTERISTICS AND PROBLEM-FOCUSED COPING STRATEGIES IN RESPONSE TO SITE CONCERNS

	1996	2002
GENDER	X^2=-.060	X^2=-.162*
AGE	t=1.438	t=.175
MARITAL STATUS	X^2=.055	X^2=-.025
CHILDREN <17YRS	X^2=.006	X^2=-.010
INCOME	X^2=-.164*	X^2=-.042
EDUCATION	X^2=-.069	X^2=-.076
EMPLOYMENT	X^2=.160**	X^2=.007
DWELLING TENURE	X^2=.105	X^2=.079
DWELLING TYPE	X^2=.120*	X^2=.029
ZONE	X^2=-.091	X^2=-.011
DISTANCE FROM SITE	t=.-1.611	t=-.479
LENGTH OF RESIDENCE AT CURRENT ADDRESS	t=-.095	t=.241
LENGTH OF RESIDENCE IN AREA	t=-1.055	t=.287

NOTES:

[1] * p<.05

** p<.01

5.4 Psychosocial Health

Psychosocial health was measured by asking questions pertaining to general health status, somatic complaints and stressful life events. Each of these measures are discussed in turn. To further investigate the findings, bivariate analyses were carried out between the measure 'somatic complaints' and a range of plausibly related sociodemographic variables.

5.4.1 General Health Status

Questions asking about perceived health status and satisfaction with health were used to measure General Health Status. When respondents were asked to rate their health compared to others the same age, the majority of respondents rated their health as 'excellent, very good or good' for both the baseline (95%) and follow-up (90%) surveys. These findings are similar to those obtained in a National Health Survey by Statistics Canada (1998) for 1994/95 where 90% rated themselves as Excellent, very good, or good and 10% as fair or poor. A different profile emerged from the in-depth interviews where 61% (11) respondents rated their health as 'excellent, very good or good'. The remaining 7 respondents rated their health as fair. When respondents were asked if they were satisfied about their health in general, a large percentage of the sample in each year rated themselves as 'very or somewhat satisfied'; 93% rated themselves as very or somewhat satisfied in 1996 and 85% in 2002. A similar profile emerged from the in-depth interviews where only one respondent rated themselves as not at all

satisfied with their health. Overall, samples in each year have relatively high ratings of perceived health status and are generally satisfied with their health. Residents self-reported health status speaks to what they value as well as what is potentially threatened by the landfill site. In particular, residents valued good health.

5.4.2 Somatic Complaints

As previously discussed in Chapter 3, a 12-item (original) and a modified 20-item symptom checklist (SCL-90) were used as a measure of distress as it manifests in somatic complaints (Derogatis et al. 1973; 1977; Taylor et al. 1989). The types of complaints that were measured in the 12-item symptom checklist include gastrointestinal, cardiovascular, respiratory, headaches and backaches. The modified 20-item symptom checklist also included 8 relevant psychosocial items taken from Goldberg's (1972) GHQ related to stress, anxiety and depression. Respondents rated how bothered they had been by a symptom over the past 2 weeks on a 5-point scale from 0, 'not at all bothered' to 4, 'extremely bothered'. The responses to the original SCL-90 somatic sub-scale items for 1996 showed no significant difference from those reported in 2002, however the majority were above normal averages. The alpha reliability coefficient was .76 in 1996 and .82 in 2002 for the 12-item scale. These can be compared to the original alpha of .86 (Derogatis et al. 1973). The original scale, therefore, performed well on the reliability measure. Mean scale scores on the (original) 12-item version

were calculated (Table 5.31) for purposes of comparison to population norms. Derogatis (1977) generated a normalized mean score of .36 for non-patient normals (both sexes) on the somatic sub-scale. Derogatis' normalizing samples was similar to the sample groups used in this study with respect to both age and sex (mean age, 46 years; 51% male, 49% female). Shaded cells indicate values **above** the .36 cut-point. For virtually every cell the scores are at or slightly above the normalized cut-point. However, these scores are not out of control when compared to other populations (Milton (approved site) = .31; Glanbrook (after 10 years) = .30); Three Mile Island (3 years later) = .55).

TABLE 5.31: MEAN RAW SCALE SCORES ON THE ORIGINAL 12-ITEM SCL-90 SOMATIC SUB-SCALE

YEAR	ZONE 1	ZONE 2	ZONE 3	ZONE 4	TOTAL
1996	.44	.39	.34	.31	.37
2002	.38	.56	.45	.32	.43
BY ZONE	.41	.48	.40	.32	0.40[a]

[a] grand mean for the total sample

The responses to the **modified** SCL-90 somatic sub-scale items for 1996 did not show a significant difference from those reported in 2002. The modified scales also performed well on the reliability measure (.84 in 1996 and .89 in 2002) Derogatis et al. (1973). Mean scale scores on the (modified) 20-item version were

also calculated (See Table 5.32). Again, shaded cells indicate values above the .36 cut-point offered by Derogatis et al. (1973). Again, the majority of scores were at or slightly above the normalized cut-point.

TABLE 5.32: MEAN RAW SCALE SCORES ON THE MODIFIED 20-ITEM SCL-90 SOMATIC SUB-SCALE

YEAR	ZONE 1	ZONE 2	ZONE 3	ZONE 4	TOTAL
1996	.45	.50	.41	.36	.43
2002	.37	.56	.48	.34	.44
BY ZONE	.41	.53	.45	.35	.44[a]

[a] grand mean for the total sample

An alternative method of investigating the prevalence of emotional distress as measured in this manner is to examine the percentage of sample groups that scored above the .36 cut-point, broken down by sample year and zone. For both the original 12-item and modified 20-item SCL-90 scale there appears to be no pattern of prevalence (Table 5.33 and 5.34). Overall, this population is not more distressed than any other population (Elliott et al. 1993; Elliott et al. 1997). In addition, a relationship cannot be made between emotional distresses and the landfill.

TABLE 5.33: PERCENTAGES OF SAMPLE GROUPS ABOVE THE CUT-POINT (.36) ON THE ORIGINAL 12-ITEM SOMATIC SUB-SCALE OF THE SCL-90

YEAR	ZONE 1	ZONE 2	ZONE 3	ZONE 4	TOTAL
1996	36	37	33	29	34
2002	35	39	37	22	33
BY ZONE	36	38	35	26	34[b]

[b] % high score for total sample

TABLE 5.34: PERCENTAGES OF SAMPLE GROUPS ABOVE THE CUT-POINT (.36) ON THE MODIFIED 20-ITEM SOMATIC SUB-SCALE OF THE SCL-90

YEAR	ZONE 1	ZONE 2	ZONE 3	ZONE 4	TOTAL
1996	41	51	45	34	43
2002	34	45	46	25	38
BY ZONE	38	48	46	30	41[b]

[b] % high score for total sample

5.4.3 AT-RISK PROFILES

A series of bivariate analysis was generated with sociodemographic variables plausibly related to somatic complaints to further investigate these findings. A number of significant relationships emerged for both the original 12-item and the modified 20-item scales (Table 5.35 and Table 5.36).

5.4.3.1 ORIGINAL 12-ITEM SCL-90 SCALE

For the 1996 baseline data, the significant relationships were between both measures of SCL-90 (Mean Raw Score (MRS) and the cut-point measure) and gender, with more females scoring above the cut-point (% above cut-point = 36% females, 28%, males). The same pattern was found for the 2002 follow-up data (% above cut-point = 43% females, 24% males). This is consistent from the key findings of previous psychosocial research (Elliott 1992; Elliott et al. 1993). Also, for both the 1996 and 2002 data, dwelling type was significantly related to MRS and the cut-point measure, with respondents who live in attached dwellings having higher scores (% above cut-point in 1996 = 51% Attached, 31% Detached; % above cut-point in 2002 = 54% Attached, 31% Detached).

In the baseline study, home ownership and income were also significantly related to both measures of SCL-90. That is, homeowners have lower scores (% above cut-point = 56% Rent; 32% Own). Further, as income increased, the SCL-90 scores decreased (% above cut-point = 56% < $30,000, 32% ≥ 30,000). This is not surprising given those with higher incomes would generally have more financial stability and flexibility to change the stressful situation. In the baseline study, the bivariate correlates of MRS indicate that higher MRS was also associated with lower education and not having full-time employment.

The key take-home message from these analyses is gender (females) and dwelling type (attached) are important characteristics for the retention of general emotional distress over all stages of the siting process.

TABLE 5.35: RELATIONSHIPS[1] BETWEEN SOCIODEMOGRAPHIC CHARACTERISTICS AND THE ORIGINAL 12-ITEM SCL-90 SOMATIC SUB-SCALE SCORES (MEAN RAW SCORE (MRS) AND ABOVE .36 CUT-POINT)

	1996		2002	
	MRS	CUT-POINT	MRS	CUT-POINT
GENDER	X^2=.185***	X^2=.118*	X^2=.195*	X^2=.208**
AGE	t=.495	t=.495	t=.614	t=.264
MARITAL STATUS	X^2=.063	X^2=.037	X^2=.031	X^2=.011
CHILDREN <17YRS	X^2=.012	X^2=.017	X^2=-.124	X^2=-.092
INCOME	X^2=.240**	X^2=.179**	X^2=.200	X^2=.195
EDUCATION	X^2=.195*	X^2=.098	X^2=.079	X^2=.063
EMPLOYMENT	X^2=-.185***	X^2=-.090	X^2=-.125	X^2=-.083
DWELLING TENURE	X^2=-.168**	X^2=-.147**	X^2=-.142	X^2=-.067
DWELLING TYPE	X^2=-.161**	X^2=-.151**	X^2=-.227**	X^2=-.171*
ZONE	X^2=-.076	X^2=-.060	X^2=-.070	X^2=-.089
DISTANCE FROM SITE	t=-.546	t=-.546	t=-1.413	t=-1.397
LENGTH OF RESIDENCE AT CURRENT ADDRESS	t=-1.257	t=-1.257	t=-.311	t=-.283
LENGTH OF RESIDENCE IN AREA	t=-.273	t=-.273	t=-.010	t=.015

NOTES:

[1] * p<.05

** p<.01

*** p<.001

5.4.3.2 MODIFIED 20-ITEM SCL-90 SCALE

For the 1996 baseline data, the significant relationships were between both measures of SCL-90 (Mean Raw Score (MRS) and the cut-point measure) and gender, with females having higher scores (% above cut-point = 50% females, 36%, males). The same pattern was found for the 2002 follow-up data, with females again having higher scores (% above cut-point = 47% females, 26% males). Also, for both the 1996 and 2002 data, dwelling type and home ownership was significantly related to MRS. That is, higher MRS was associated with respondents who live in attached dwellings. Also, respondents who are renters have higher scores. This is surprising since homeowners potentially have more at stake.

In the baseline study, income, education and employment were also significantly related to the MRS measure of SCL-90. As income increased, the SCL-90 scores decreased (% above cut-point = 59% < $30,000, 42% ≥ 30,000). Further, as education increases, SCL-90 scores decrease (% above cut-point = 59% < High school, 42% ≥ High school). Lastly, higher MRS was also associated with not having full-time employment (% above cut-point = 39% Full-time, 49% Other). While these are important factors in the initial experience of emotional distress, dwelling type, tenure, and gender are again important characteristics for the retention of emotional distress throughout the landfill siting process.

TABLE 5.36: RELATIONSHIPS[1] BETWEEN SOCIODEMOGRAPHIC CHARACTERISTICS AND THE MODIFIED 20-ITEM SCL-90 SOMATIC SUB-SCALE SCORES (MEAN RAW SCORE (MRS) AND ABOVE .36 CUT-POINT)

	1996		2002	
	MRS	CUT-POINT	MRS	CUT-POINT
GENDER	X^2=.203***	X^2=.140*	X^2=.193*	X^2=.221**
AGE	t=.172	t=.172	t=.459	t=.102
MARITAL STATUS	X^2=.014	X^2=.026	X^2=-.012	X^2=-.078
CHILDREN <17YRS	X^2=.051	X^2=.090	X^2=-.040	X^2=-.070
INCOME	X^2=.188**	X^2=.120	X^2=.122	X^2=.214
EDUCATION	X^2=.142*	X^2=.048	X^2=.035	X^2=.080
EMPLOYMENT	X^2=-.176***	X^2=-.104	X^2=-.073	X^2=-.083
DWELLING TENURE	X^2=-.152**	X^2=-.096	X^2=-.155*	X^2=-.046
DWELLING TYPE	X^2=-.109*	X^2=-.082	X^2=-.247***	X^2=-.139
ZONE	X^2=-.094	X^2=-.077	X^2=-.049	X^2=-.060
DISTANCE FROM SITE	t=-1.100	t=-1.100	t=-.946	t=-.932
LENGTH OF RESIDENCE AT CURRENT ADDRESS	t=-1.455	t=-1.455	t=-1.016	t=-.983
LENGTH OF RESIDENCE IN AREA	t=-.959	t=-.959	t=-.612	t=-.585

NOTES:

[1] * p<.05

** p<.01

*** p<.001

5.4.4 Stressful Life Events

A potential confounder of the measurement of psychosocial health and well-being as impacted by environmental exposure is stressful life events (e.g., marriage, divorce, job loss, and so on). The experience of such events can cause emotional distress and, therefore, was documented in the surveys to control for this potential confounder. These were documented through the inclusion of selected items from Critical Life Events Scale (Holmes and Rahe 1967). Respondents were asked whether they had experienced any of these stressful life events in the 12 months prior to the survey administration (Table 5.37).

TABLE 5.37: PERCENTAGES OF SAMPLE GROUPS REPORTING STRESSFUL LIFE EVENTS IN THE 12 MONTHS PRIOR TO SURVEY ADMINISTRATION

EVENT	1996 (n=328)	2002 (n=170)
Job loss**	7% (23)	17% (29)
Serious illness/personal injury***	10% (33)	23% (39)
Death of spouse/partner or anyone close	22% (72)	22% (37)
Divorced/separated from spouse/partner	4% (13)	2% (3)

NOTE:

[1] ** p< .01

*** p< .001

The most reported event for both years was the death of anyone close to you, including a spouse/partner. This is not surprising given the generality of the item and the potential pools of relatives/acquaintances upon which people could draw when responding. In general, the incidence of job loss and serious illness/personal injury significantly increased in 2002. Given the significant increase in reported stressful life events in 2002 one must be cautious about attempting to link reported levels of emotional distress with exposure to the study site in Time 2.

5.5 Logistic Regression Analysis

Logistic regression analysis was used to explore the role of mediating factors in the reappraisal process over time. In essence, this chapter attempts to build on the 'at risk' profiles of vulnerable groups provided by the bivariate analyses through the multivariate analyses of psychosocial outcomes. The purpose of logistic regression is to identify whether each explanatory variable renders each outcome measure more or less likely in the context of other explanatory variables. The conceptual lens that guides this research (Figure 2.3) suggests psychosocial impacts are influenced by a number of mediating factors. By going beyond the descriptive state and profiling characteristics of respondents more likely to report psychosocial impacts and more likely to take action in response to impacts, as well as changes in these outcomes over time, aids in the operationalization of the research objectives of this thesis. Logistic regression was chosen as a method of analysis for three further reasons: (1) the outcomes of

interest are dichotomous; (2) the mediating factors are a mix of categorical and continuous variables; and, (3) the relationship between the explanatory (mediating) variable and outcome variable can be described a logistic function.

Logistic regressions were calculated for the outcomes concern, health concern, daily life effects, emotional distress and emotion- and problem-focused coping. For each outcome variable 3 models were run: (1) a model using the 1996 survey data; (2) a model using the 2002 survey data; and, (3) a model using both datasets to investigate determinants of change over time. A model was created for each block of variables in Table 5.38. Models were run using a backward stepwise selection or backward elimination algorithm (i.e., Wald method). Method selection allows you to specify how independent variables are entered into the analysis. In this instance, the entire block of variables is entered into the model, and then each variable is removed based on a tolerance criterion (i.e., the probability of the Wald statistic). Only the variables that made a contribution to the model were kept. A final model was run with these variables. Variables were judged to contribute to the model if the significance level for the Wald inclusion test statistic was 0.10 or lower. Results are reported for the models that produced multivariate risk estimates.

TABLE 5.38: LOGISTIC REGRESSION MODEL DEVELOPMENT AND EXPLANATORY VARIABLES

VARIABLES	TYPE	CODING (REFERENCE CATEGORY IS UNDERLINED)
STEP 1		
Income	Categorical	≥ $30,000 or < $30,000
STEP 2		
Gender	Categorical	Male vs. Female
Age	Continuous	Older vs. Younger
Number of Children ≤ 17yrs	Categorical	No vs. Yes
Marital Status	Categorical	No Partner vs. Partner
Education	Categorical	≥ High school vs. < High school
Employment	Categorical	Other vs. Full-time
Dwelling Tenure	Categorical	Rent vs. Own
Dwelling Type	Categorical	Attached vs. Detached
STEP 3		
Number of Years at Current Address	Continuous	More vs. Less
Number of Years in Area	Continuous	More vs. Less
Distance from Site (m)	Continuous	Near vs. Far
Zone	Categorical	Closer vs. Further
STEP 4		
SCL-90 20-item Cut-point Score	Categorical	Below vs. Above Cut-point (0.36)
SCL-90 20-item Mean Raw Score	Continuous	High vs. Low
SCL-90 12-item Cut-point Score	Categorical	Below vs. Above Cut-point (0.36)
SCL-90 12-item Mean Raw Score	Continuous	High vs. Low
STEP 5		
FINAL MODEL OF ALL CONTRIBUTING VARIABLES		

5.5.1 CONCERN

The 1996 logistic regression model of site concern (Table 5.39) had a ρ^2 of .12 where ρ^2 measures goodness of fit for logistic regression. It is defined as one minus the ratio of the maximized log likelihood values of the fitted and constant only-term models (Wrigley 1985). ρ^2 ranges from zero to one; values ranging from .20 to .40 represent a very good fit of the model (Wrigley 1985). The positive predictive value (i.e., the percentage of those respondents who were predicted as concerned who actually reported concern) was relatively high (69%) but the negative predictive value (i.e., the percentage of respondents predicted as not concerned who actually reported no concern) was slightly lower (62%). The model had poor specificity (22%) (i.e., the percentage not concerned who were correctly predicted) but good sensitivity (93%) (i.e., the percentage concerned who were correctly predicted). This model correctly classified 68% of respondents.

The significant explanatory variables in the 1996 model are reported in Table 5.39 ($p \leq .05$; the shaded cells). The Relative Odds (R.O.) and Confidence Intervals (C.I.) associated with each variable are also reported in the table. Relative Odds (exponent β) is the factor by which the odds of having the outcome variable will change when the independent variable increases by one unit (or, in the case of categorical variables, change from one category to another) (Norusis 1990). If β is positive, the relative odds are greater than 1, which means that the odds are increased. If β is negative, the relative odds are less than 1, which means

that the odds are decreased. Based on the significant effects in the 1996 model, residents are more likely to report concern if they: lived in zone 1 as opposed to zone 4, had an annual income ≥ $30,000, were employed full-time and had an SCL-90 12-item score above the normal cut-point (.36). Non-significant variables (the non-shaded cells in Table 5.39 for 1996) remained in the model for reasons cited above.

TABLE 5.39: RESULTS OF LOGISTIC REGRESSION FOR OUTCOME CONCERN

1996		2002	
VARIABLE	R.O. (C.I.)	VARIABLE	R.O. (C.I.)
Zone		Gender	.57 (.30;1.07)
Zone 1	3.32 (1.21;9.11)	Dwelling Tenure	3.59 (1.05;12.28)
Zone 2	.94 (.44;2.02)		
Zone 3	.58 (.26;1.29)		
Income	.30 (.12;.72)		
Employment	1.93 (1.05;3.55)		
Cut-point Score (12-item)	2.62 (1.34;5.10)		
p^2	.12	p^2	.04
Sensitivity	93%	Sensitivity	96%
Specificity	22%	Specificity	13%
% Correctly Classified	68%	% Correctly Classified	63%

The 2002 logistic regression model of site concern (Table 5.39) had a ρ^2 of .04. The positive predictive value was relatively low (63%) but the negative predictive value was slightly higher (69%). The model had poor specificity (13%) but good sensitivity (96%). This model correctly classified 63% of respondents. The significant explanatory variable in the 2002 model was dwelling tenure. Residents were more likely to be concerned if they owned a dwelling. Gender was a non-significant variable in the model but remained in the model for reasons cited above.

5.5.2 Health-Related Concern

The 1996 logistic regression model of health-related concern (Table 5.40) had a ρ^2 of .10. The positive predictive value was 65% and the negative predictive value was slightly lower at 62%. The model had a specificity of 53% but relatively good sensitivity at 79%. This model classified approximately 64% of respondents. The significant explanatory variables in the 1996 model included income, employment, and SCL-90 12-item cut-point score. Residents were more likely to experience health-related concern if they: had an SCL-90 12-item score above the normal cut-point, were employed full-time and had an annual income ≥ $30,000. Non-significant variables (the non-shaded cells in Table 5.40 for 1996) remained in the model for reasons cited above.

The 2002 logistic regression model of health-related concern (Table 5.40) had a ρ^2 of .07. The positive predictive value was 60% but the negative predictive

value was high at 81%. The model had poor specificity (48%) but good sensitivity (81%). This model correctly classified 64% of respondents. The significant explanatory variables in the 2002 model included gender and SCL-90 20-item cut-point score. Residents were more likely to experience health-related concern if they: were male and had an SCL-90 20-item score above the normal cut-point. Dwelling tenure was a non-significant variable but remained in the model for reasons cited above.

The change over time model (i.e., did not report health-related concern in 1996 but did in 2002) of health-related concern had a ρ^2 value of .03 (Table 5.40). The positive predictive value was 0% but the negative predictive value was high (87%). The model has good specificity (100%) but poor sensitivity (0%). This model correctly classified 87% of respondents. Residents were more likely to report health-related concern *over time* if they had an SCL-90 20-item score above the normal cut-point in 2002.

TABLE 5.40: RESULTS OF LOGISTIC REGRESSION FOR OUTCOME HEALTH- RELATED CONCERN

1996		2002		CHANGE OVER TIME	
VARIABLE	R.O. (C.I.)	VARIABLE	R.O. (C.I.)	VARIABLE	R.O. (C.I.)
Zone		Cut-point Score (20-item)	2.71 (1.38;5.31)	Cut-point Score (20-item)	2.43 (1.00;5.91)
Zone 1	2.34 (.99;5.56)	Gender	.44 (.23;.84)		
Zone 2	1.07 (.52;2.22)	Dwelling Tenure	3.53 (.90;13.85)		
Zone 3	.75 (.34;1.64)				
Cut-point Score (12-item)	2.48 (1.35;4.57)				
Employment	1.90 (1.07;3.40)				
Income	.30 (.13;.73)				
p^2	.10	p^2	.07	p^2	.03
Sensitivity	73%	Sensitivity	81%	Sensitivity	0%
Specificity	52%	Specificity	48%	Specificity	100%
% Correctly Classified	64%	% Correctly Classified	64%	% Correctly Classified	87%

5.5.3 Daily Life Effects

The 1996 logistic regression model of daily life effects (Table 5.41) had a ρ^2 of .12. The positive predictive value was relatively low (53%) but the negative predictive value was relatively high (76%). The model had good specificity (95%) but poor sensitivity (15%). This model correctly classified 74% of respondents. Residents were more likely to report (perceived/anticipated) daily life effects if they: lived in zone 1 as opposed to zone 4, had an annual income ≥ $30,000, and had a high SCL-90 12-item MRS. Non-significant variables (the non-shaded cells in Table 5.41 for 1996) remained in the model for reasons cited above.

The 2002 logistic regression model of daily life effects (Table 5.41) had a ρ^2 of .14. The positive predictive value was 0% but the negative predictive value was high at 81%. The model had good specificity (100%) but poor sensitivity (0%). This model correctly classified 81% of respondents. The significant explanatory variables in the 2002 model included dwelling type and SCL-90 20-item cut-point score. Residents were more likely to report (perceived/anticipated) daily life effects if they: lived in a detached dwelling and had an SCL-90 20-item score above the normal cut-point. Number of years at current address was a non-significant variable in the model but remained in the model for reasons cited above.

The change over time model (i.e., reported (perceived/anticipated) daily life effects in 1996 but did not in 2002) of daily life effects had a ρ^2 value of .16 (Table 5.41). The positive predictive value was relatively low (67%) but the

negative predictive value was high (80%). The model had good specificity (96%) but poor sensitivity (11%). This model correctly classified 79% of respondents. Residents were more likely to report less (perceived/anticipated) daily life effects *over time* if they: had a partner and had a low SCL-90 20-item MRS. Dwelling type was a non-significant variable in the model but remained in the model for reasons cited above.

TABLE 5.41: RESULTS OF LOGISTIC REGRESSION FOR OUTCOME DAILY LIFE EFFECTS

1996		2002		CHANGE OVER TIME	
VARIABLE	R.O. (C.I.)	VARIABLE	R.O. (C.I.)	VARIABLE	R.O. (C.I.)
Zone		Cut-point Score (20-item)	3.89 (1.72;8.77)	MRS (20-item)	.003 (.000;.14)
Zone 1	3.73 (1.49;9.39)	No. of Years at Current Address	.94 (.89;1.01)	Marital Status	5.71 (1.48;22.09)
Zone 2	2.10 (.90;4.93)	Dwelling Type	10.43 (1.30;83.67)	Dwelling Type	2.77 (.08;1.01)
Zone 3	.68 (.24;1.96)				
Income	.21 (.06;.71)				
MRS (12-item)	2.25 (1.08;4.70)				
p^2	.12	p^2	.14	p^2	.16
Sensitivity	15%	Sensitivity	0%	Sensitivity	11%
Specificity	95%	Specificity	100%	Specificity	99%
% Correctly Classified	74%	% Correctly Classified	81%	% Correctly Classified	79%

5.5.4 Emotion-Focused Coping

The 1996 logistic regression model of emotion-focused coping (Table 5.42) had a ρ^2 of .12. The positive predictive value was 68% and the negative predictive value was slightly lower at 62%. The model had low specificity (21%) but relatively good sensitivity (93%). This model correctly classified 68% of respondents. Residents were more likely to use emotion-focused coping strategies (significant explanatory variables) if they: lived in zone 1 as opposed to zone 4, had an annual income ≥ $30,000 and had an SCL-90 12-item score above the normal cut-point. Non-significant variables (the non-shaded cells in Table 5.42 for 1996) remained in the model for reasons cited above.

The 2002 logistic regression model of emotion-focused coping (Table 5.42) had a ρ^2 of .04. The positive predictive value was 63% but the negative predictive value was only slightly higher at 69%. The model had poor specificity (13%) but good sensitivity (92%). This model correctly classified 63% of respondents. The significant explanatory variable in the 2002 model was dwelling tenure. Residents were more likely to use emotion-focused coping strategies if they owned a dwelling. Gender was a non-significant variable in the model but remained in the model for reasons cited above.

TABLE 5.42: RESULTS OF LOGISTIC REGRESSION FOR OUTCOME EMOTION-FOCUSED COPING

1996		2002	
VARIABLE	R.O. (C.I.)	VARIABLE	R.O. (C.I.)
Cut-point Score (12-item)	2.47 (1.28;4.76)	Gender	.57 (.30;1.07)
Employment	1.80 (.98;3.30)	Dwelling Tenure	3.59 (1.05;12.28)
Income	.31 (.13;.75)		
Zone			
Zone 1	3.25 (1.19;8.88)		
Zone 2	.89 (4.17;1.88)		
Zone 3	.54 (.24;1.19)		
p^2	.12	p^2	.04
Sensitivity	93%	Sensitivity	96%
Specificity	21%	Specificity	13%
% Correctly Classified	68%	% Correctly Classified	63%

5.5.5 PROBLEM-FOCUSED COPING

The 1996 logistic regression model of problem-focused coping (Table 5.43) had a ρ^2 of .10. The positive predictive value was 69% and the negative predictive value was slightly lower at 62%. The model had high specificity (84%) but relatively poor sensitivity (40%). This model correctly classified 64% of respondents. Residents were more likely to use problem-focused coping strategies

in 1996 (significant explanatory variables) if they: were employed full-time, had an annual income ≥ $30,000 and had an SCL-90 12-item score above the normal cut-point.

The 2002 logistic regression model of problem-focused coping (Table 5.43) had a ρ^2 of .02. The positive predictive value was 0% and the negative predictive value was 64%. The model had good specificity (100%) but poor sensitivity (0%). This model correctly classified 64% of respondents. The significant explanatory variable in the 2002 model was gender. Residents were more likely to use problem-focused coping strategies in 2002 if they were male.

TABLE 5.43: RESULTS OF LOGISTIC REGRESSION FOR OUTCOME PROBLEM-FOCUSED COPING

1996		2002	
VARIABLE	R.O. (C.I.)	VARIABLE	R.O. (C.I.)
Income	.37 (.15;.91)	Gender	.51 (.27;.94)
Employment	2.26 (1.26;4.05)		
Cut-point Score (12-item)	2.838 (1.57;5.13)		
p^2	.10	p^2	.02
Sensitivity	40%	Sensitivity	0%
Specificity	84%	Specificity	100%
% Correctly Classified	64%	% Correctly Classified	64%

5.5.6 Scored Above Normal Cut-point (12-item)

There were no variables the significantly contributed to the 1996 logistic regression model of above normal cut-point (12-item) (Table 5.44). Non-significant variables included: gender, dwelling type and income.

The 2002 logistic regression model of above normal cut-point (12-item) (Table 5.44) had a ρ^2 of .04. The positive predictive value was relatively low (57%) and the negative predictive value was higher at 68%. The model had good specificity (95%) but poor sensitivity (14%). This model correctly classified 67% of respondents. The significant explanatory variables in the 2002 model were gender and dwelling type. Residents were more likely to score above the normal cut-point on the 12-item scale in 2002 if they were female and lived in an attached dwelling. Children ≤ 17yrs was a non-significant variable in the model but remained in the model for reasons cited above.

5.5.7 Scored Above Normal Cut-point (20-item)

The 1996 logistic regression model of above normal cut-point (20-item) (Table 5.45) had a ρ^2 of .03. The positive predictive value was 59% and the negative predictive value was slightly lower at 58%. The model had high specificity (89%) but relatively poor sensitivity (19%). This model correctly classified 58% of respondents. Gender was a significant explanatory variable in the 1996 model. Residents were more likely to score above the normal cut-point

(20-item) if they were female. Income was a non-significant variable in the model but remained in the model for reasons cited above.

The 2002 logistic regression model of above normal cut-point (20-item) (Table 5.45) had a ρ^2 of .10. The positive predictive value was relatively low (56%) and the negative predictive value was higher at 68%. The model had good specificity (84%) but poor sensitivity (34%). This model correctly classified 66% of respondents. The significant explanatory variables in the 2002 model were gender, dwelling type, number of children ≤ 17yrs and marital status. Residents were more likely to score above the normal cut-point on the 20-item scale in 2002 if they were female, lived in an attached dwelling, did not have children ≤ 17yrs and did not have a partner.

TABLE 5.44: RESULTS OF LOGISTIC REGRESSION FOR OUTCOME ABOVE 12-ITEM CUT-POINT (.36)

1996		2002	
VARIABLE	R.O. (C.I.)	VARIABLE	R.O. (C.I.)
Gender	1.43 (.82;2.45)	Gender	2.72 (1.36;5.43)
Dwelling Type	.52 (.24;1.12)	Dwelling Type	.34 (.14;.84)
Income	2.11 (.95;4.66)	Children ≤17yrs	.53 (.27;1.04)
p^2	.04	p^2	.04
Sensitivity	19%	Sensitivity	14%
Specificity	94%	Specificity	95%
% Correctly Classified	68%	% Correctly Classified	67%

TABLE 5.45: RESULTS OF LOGISTIC REGRESSION FOR OUTCOME ABOVE 20-ITEM CUT-POINT (.36)

1996		2002	
VARIABLE	R.O. (C.I.)	VARIABLE	R.O. (C.I.)
Gender	1.75 (1.04;2.95)	Gender	2.93 (.1.49;5.77)
Income	1.88 (.89;3.97)	Dwelling Type	2.39 (1.02;5.58)
		Children ≤ 17yrs	.49 (.25;.96)
		Marital Status	.33 (.13;.88)
p^2	.03	p^2	.10
Sensitivity	19%	Sensitivity	34%
Specificity	89%	Specificity	84%
% Correctly Classified	58%	% Correctly Classified	66%

There are several points to be made from these analyses. The first is to acknowledge the models did not perform well since the overall goodness-of-fit of the models were very poor. These models, therefore, must be interpreted with caution. Low ρ^2 values may indicate that there are important unaccounted for variables (e.g., interaction terms). Having said this, the intent of the models was to explain the relationships rather than to predict. Overall, the models have helped to obtain a general understanding of the relationships between the outcome and mediating factors. Further analysis were conducted for all the models that included incorporating the variables excluded from the models, but they did not

impact substantially on the goodness-of-fit measures and have not been presented here.

Second, it is instructive to recognize the diversity of the models between the 1996 and 2002 datasets. There are common features of the 1996 models for each outcome variable, as well as the 2002 models. Socioeconomic status (measured as income and employment status) and psychosocial distress levels were important explanatory variables of the outcomes concern, health concern, daily life effects and the coping response (emotion- and problem-focused) in 1996. In particular, residents with an annual household income ≥$30,000, full-time employment and levels of psychosocial distress above the normal cut-point (0.36) were more likely to report these outcomes in 1996. Zone was an important explanatory variable in the 1996 concern, daily life effects and emotion-focused coping models (non-significant explanatory variable for health concern). This points to the importance that distance from the site played in the process of psychosocial effects in 1996 and confirms the distance gradients apparent in the outcome variables at this stage of the siting process (Tables 5.9, 5.15 and 5.17). The lack of effect of distance in the 2002 models confirms proximity was not an important factor in the experience of psychosocial effects and coping in 2002. One possible explanation is that Taro was legislated to inform and involve all households within 500 meters (i.e., zone 1) of the landfill site during the EA process. Therefore, adaptation may have occurred more in Zone 1 because these

households had to move on with their everyday life. Further, within the proponents EA document, Zone 1 was assigned the 'primary impact zone".

However, in the 2002 models, dwelling tenure, type and gender were important explanatory variables for the retention of outcomes over time. In terms of gender, these findings do not support those of other studies that report higher levels of psychosocial effects among women (Taylor et al. 1989; Flynn et al. 1994). Instead males were more likely to retain psychosocial effects over time, specifically health-related concern and a problem-focused coping response. Overall, individual level variables frequently emerged as significant explanatory variables.

A different profile was obtained for the models that explored respondents more likely to experience psychosocial distress. While gender and dwelling type were important explanatory variables, females and residents living in attached dwellings more likely to score above the normal cut-point for normal on the SCL-90 12- and 20-item scales (.36). This is consistent with other studies that report higher levels of emotional distress among women (Taylor et al. 1989; Elliott 1992; Elliott et al. 1993). Dwelling type is surprising since homeowners potentially have more at stake. A fundamental difficulty in interpreting these results is the uncertain cause and effect linkages. These findings are consistent with the bivariate analysis described previously and confirm that emotional distress cannot be linked to the landfill.

Finally, these analyses indicate that there is no simple cause and effect relationship between exposure and outcome. There are a number of mediating factors that contribute to each psychosocial outcome, alone and, most often, in combination with other factors. Further, the specific factors involved vary according to the stage of the siting process (pre-siting process vs. post-siting process).

5.6 SUMMARY

This chapter reported the major quantitative and qualitative results of this research organized around the three study objectives. Despite residents identifying several features (including site-related features) they would change about the area in which they live, the results reveal that the landfill had little impact on general neighbourhood satisfaction, which remained high throughout the siting process. This indicates, however, that residents are constantly seeking an ideal, safe and zero-risk environment in which to live and raise their families. Not surprisingly, there was a high degree of public awareness of the Taro East Landfill site as the popular media frequently contained accounts of siting decisions and there was substantial community opposition. Site-related concern focused primarily on trust and health issues. The siting process led individuals to the conclusion that neither the actors nor the technology could be trusted. Further, Taro's past operations of the West Landfill site appears to have made residents hypersensitive to issues surrounding the East Landfill site. In particular, health-related site concern

significantly increased over time. Concomitant with this shift was a shift in the nature of the health concern (short-term vs. long-term). This can be attributed, in part, to the toxic contamination events related to the operating practices of the site (e.g., illegal dumping of toxic waste). Despite latent concerns, the impact of the landfill on residents' everyday lives significantly decreased over time. Most coping strategies involved a cognitive reappraisal of the site in the form of adaptation; that is, people are moving on with their everyday lives. Residents' reliance on emotion-focused coping strategies can be attributed in part to their expressed lack of control in the siting process, mistrust in the actors (industry, government, community groups) involved, as well as the lack of a shared/collective experience in the post-siting process. Many sources of information about the landfill were outlined in the in-depth interviews. The majority considered the newspaper, in particular The Stoney Creek News, to be their main source of information. On the other hand, individuals felt the community meetings were 'unproductive' and 'a waste of time'.

Psychosocial health was also investigated by asking a range of general health status, somatic complaint and stressful life events questions. By in large respondents had high ratings of perceived health status and are generally satisfied with their health. The prevalence of emotional distress among respondents was no higher than that of other populations (Elliott et al. 1993; 1997). There was a high frequency of stressful life events which occurred in 2002, however.

Lastly, results of the logistic regression analyses confirm that a combination of factors is significantly associated with site-related concern, health concern, effects on daily life, emotional distress and the coping strategy used by residents. Distance from the site played an important explanatory role in the process of psychosocial impacts in the pre-siting process of the landfill, confirming the gradients apparent in the outcome variables for 1996. Further, socioeconomic status and level of emotional distress were important mediators of site-related outcomes in 1996. However, dwelling tenure and type as well as gender were important explanatory variables in the retention of these outcomes in 2002. These findings raise a number of interesting questions and can be used to build 'at-risk' profiles of vulnerable groups; these issues will be addressed in the final chapter.

CHAPTER 6: DISCUSSION AND CONCLUSIONS

The goal of this thesis was to understand an environment and health relationship by addressing psychosocial impacts in a population living near a solid waste industrial disposal facility in Stoney Creek, Ontario. Specifically, local residents' reappraisal of Taro Aggregates Ltd. East Landfill site was investigated over time. The scope of this research was based on the need for additional comparative, as well as longitudinal, studies that measure how individuals and communities respond to the process of making the decision to site a landfill, and how these responses change over time as residents live with a landfill. This thesis addressed three specific objectives:

> *1. To examine residents' reappraisal of a solid waste disposal facility;*
>
> *2. To explore the role of mediating factors in the reappraisal process; and,*
>
> *3. To integrate quantitative and qualitative approaches to the research question.*

In addressing these objectives, the contributions of this research are three-fold: theoretical, methodological and substantive. This study builds on the existing environmental stress and coping, place effects and psychosocial literatures by measuring changes in psychosocial effects, and the factors that mediate these

changes. A methodological contribution is offered by the integration of quantitative and qualitative methods. Finally, the substantive contributions are linked to the applications of the research findings.

This chapter will detail these contributions and also highlight the policy implications of the research findings, as well as the directions for future research. First, the key research findings of this thesis are summarized.

6.1 Summary of Research Findings

Residents' reappraisal of the Taro East Landfill site reveals a wide range of emotional, behavioural and community-level effects that are primarily but not exclusively negative. First, the results reveal the landfill had little impact on neighbourhood satisfaction, which remained high throughout all stages of the siting process. Second, there was a high degree of public awareness of this issue as the popular media frequently contained accounts of NIMBY (Not In My Back Yard) and reactions to the illegal toxic dumping events over time. Third, concern and negative perceptions did not significantly decrease over time; however the frequency of respondents reporting health-related concern significantly increased over time. Concomitant with this shift was a shift in the nature of the health concern (short- vs. long-term). Lastly, the incidence of daily life effects (perceived and anticipated) and problem-focused coping significantly declined over time. These findings imply an ongoing process of reappraisal whereby, for many, latent concerns remain even though they have adapted to the landfill.

Confirming what is found in the literature (Elliott et al. 1997; Hadden 1991; Wakefield & Elliott 2000), these findings indicate that the concerns reported and impacts experienced relate *as much* (perhaps more) to the process of siting a landfill as to the landfill (outcome) itself. In particular, risk is constructed based on what it means to residents to have a landfill located in their community (i.e., social constructionist perspective). The factors that affect the nature of this mediation are related to context (e.g., process issues; key facility-related events), collective (e.g., community values and worldviews related to trust and equity), and composition (e.g., socioeconomic status, dwelling tenure and type). These factors have implications not only for the experience of environmental stress, but also for the type of coping strategy employed by residents. Most used a variety of coping strategies to mitigate effects, although emotion-focused strategies were used with more frequency.

6.2 Theoretical Contributions

This thesis makes important contributions to three bodies of theoretical literature. The first is the literature related to environmental stress and coping. The findings of this thesis are consistent with the transactional model of reappraisal provided by Lazarus and Folkman (1984). That is, individual response to the Taro East Landfill site is an ongoing, iterative process of primary and secondary appraisal, and reappraisal. In the context of their lives as a whole, many residents perceived the landfill as a threat, harm or challenge, coped with it, and

adapted to the facility over time. For many, the landfill remains a source of (health) concern (60% of respondents in 2002 remained concerned about the landfill and 65% maintain concerns about health) and is a threat, but they have learned to adapt to the facility and move on with their everyday lives through a range of coping strategies.

This study builds on the environmental stress and coping theory with respect to the factors that mediate effects of exposure to the Taro East Landfill site, the availability of coping resources to deal with the site and the reappraisal process. As Lazarus (1993) suggests, not only are contextual factors important for understanding the process of primary and secondary appraisal and reappraisal, but the process measures of stress and coping must also be placed within the larger structure of a person's life and ways of relating to the world. In so doing, our understanding of the role of place in shaping health and well-being is enhanced; an area that has received far less attention in the literature. The results of this study reveal that a combination of contextual, collective and compositional factors are important to both the experience of environmental stress and the coping response but that the specific factors involved vary according to the stage of the siting process (pre-siting vs. post-siting processes).

Respondent reactions in the **context** of possibly hosting the Taro East Landfill site were consistent with what is suggested in the psychosocial literature related to proposed and recently approved sites (Baxter et al. 1999; Elliott et al. 1993; 1997; Wakefield & Elliott 2000; Baxter & Greenlaw 2005). Residents were

concerned not only about the potential impacts of the proposed landfill, but also from the pre-siting process itself. First, the pre-existing Taro West Landfill site in the study community appears to have sensitized residents to the potential negative effects of the Taro East Landfill site (e.g., escape of leachate into the groundwater, illegal dumping of leachate into the Hamilton Harbour). Therefore, when Taro proposed to site a second landfill (the East Landfill site under study) this pre-existing context triggered a large amount of community opposition and media coverage. It is possible that the earlier environmental problems of the West Landfill affected the public's perception of the East Landfill facility. In contrast to previous research (Slovic 1987), the familiarity about risks from landfill activities to those exposed increased perceived risk.

Further, process issues influenced residents' appraisal of the proposed site. Despite Taro's active communication strategies during the development of the East Landfill's EA document (e.g., public meetings, door-to-door campaigns), the decision-making process caused a high level of community opposition. The legislative framework in Ontario when the site was proposed allowed for the MOE's "absolute discretion" in making the decision whether to hold a public hearing (RSO 1990). The EA guidelines explained that even if the Minister receives submissions requiring a hearing in the course of the public review period, the Minister is authorized to decide to the contrary (RSO 1990). When the MOE exercised this discretion and approved the Taro East Landfill without a public hearing many opposed to the site felt angry and frustrated, especially since some

felt this was their only opportunity to truly influence the process (i.e. previous consultation was perceived as superficial/routine). This finding is consistent with what was found in the study completed by Elliott and Wakefield (2000), which reported that residents within Stoney Creek felt that they had only "perfunctory opportunities to get involved", and little opportunity to effect any real change or influence the process. In addition, residents felt the community meetings set up by Taro were 'unproductive' and 'a waste of time' (e.g., not information transfer sessions). According to Yacoumidis (1998) landfill opposition can be reinforced by the failure to recognize and adequately deal with resident concerns during the siting process. Residents are thereby disempowered in the siting process, resulting in higher levels of concern and distrust (Yacoumidis 1998). Therefore, Stoney Creek residents' conception of risk is in part based on *how* the actors (industry and government) communicated information and involved the public in the pre-siting process (Foucault 1991).

How information was passed on through the media also influenced residents' construction of risk. The newspaper was a regular and important source of information among Stoney Creek residents, however as Wakefield and Elliott (2003) suggest, coverage was selective and increased around key decision periods in the EA process (i.e., the submission of the proponents' EA Document) and when controversial issues arose (i.e., environmental degradation). Researchers have reported that lay people tend to over-estimate risks that receive a high level of media attention, compared to those that do not (Douglas 1985; Slovic 1987;

2000; Heimer 1988; Hansson 1989; Hansen 1991; Spenser & Triche 1994). The high level of media attention surrounding the siting of the East Landfill appears to have made the community hypersensitive to the facility.

Distance also played an important role in the experience of psychosocial effects in the pre-siting process, apparent by the distance gradients in the outcome variables (Tables 5.6, 5.9, 5.15 and 5.17). Residents living closer to the site perceived themselves to be at higher risk than those living farther away. Two possible explanation for this relationship include: (1) During the EA process, Taro was legislated to inform and involve all households within 500 meters (i.e., zone 1) of the proposed site; and, (2) Within the Taro East Landfill's EA document households within 500 meters of the site were described to be in the "primary impact zone". This spatial gradient was not apparent in 2002 where residents judged their exposure to risks from the landfill as uniform, independent of location. Perhaps adaptation occurred more in zone 1 because residents had to move on with their everyday lives.

This points to the importance that key facility-related events (e.g., illegal dumping of toxic waste) played in the post-siting process of the landfill. Poor management of the facility appears to have influenced residents' retention of negative perceptions of the landfill over time. These events altered the set of environmental conditions to which residents were responding and changed how the landfill issue was framed in the community (non-hazardous vs. hazardous). For example, residents' were more concerned about the possible long-term health

impacts of Taro's waste disposal activities in 2002 (e.g., cancer). This underscores psychometric research centered on the degree to which risk represents 'dread' as essential to risk perception (Slovic 1987; 2000). Further, these events realized anticipated fears in the community and influenced the experience of stress in the post-siting process. This was reinforced by residents' perceived lack of opportunity for meaningful involvement and the corporations' (perceived) lack of communication in the post-siting process. For example, residents expressed that "[it's] like they've fallen off the face of the Earth" ("Bob", Stoney Creek, resident).

In addition, the experience of psychosocial impacts and coping was influenced by the larger structure of residents' ways of life and worldviews. However, the findings of this study reveal the contexts within which this research takes place also inform these **collective** factors. Ways of life were determined by what residents' value about their community (Douglas & Wildavsky 1982; Edelstein 1988; Kaperson 1992; Tansey 2004). Throughout the siting process residents valued their health and physical surroundings: the small town feel but access to the city, nature, quiet, and peacefulness. It is important to understand how residents characterize the meaningful aspects of their community because it speaks to what is potentially threatened by environmental stressors, and therefore, how the landfill is interpreted (Edelstein 1988; Baxter & Greenlaw 2005). According to the cultural risk theory (Douglas & Wildavsky 1982; Douglas 1994) this provides insight into why people select different risks for attention; that is, to

support a particular way of life. Stoney Creek residents are seeking an ideal, safe virtually risk-free environment in which to live and raise their families, however residents 'choose' to be concerned because the landfill directly threatens their ways of life (Douglas & Wildavsky 1982; Baxter & Lee 2004). Uncertainty about the potential siting of a facility, and the possible health, nuisance and land value effects exacerbated residents concerns about the risks from the landfill (Kahneman et al. 1982; Vyner 1988; Johnson & Chen 1995; Slovic 1999). Here, uncertainty strikes directly at residents' core values (i.e., physical environment and health), threatening their security (Baxter & Greenlaw 2005). Thus, the degree to which the landfill threatens residents' ways of life is tied to the elements of context described earlier (e.g., process issues; facility-related events) and how these elements reinforce feelings of anxiety, frustration and disappointment.

The concept of zero-risk, however, is associated with the risk society framework offered by Beck and Giddens where society is organized in response to risk (Beck 1992a; 1992b; Giddens 1990; 1991). The Stoney Creek case study shows how a proposed as well as a operating non-hazardous industrial landfill can shatter residents security in their protective cocoons (i.e., ways of life) when the site threatens what individuals value about their community. In particular, the facility-related events appear to have altered residents' conceptions of the landfill and caused them to rethink the situation. This is similar to the experience of a 'fateful moment' (or triggers, according to Lazarus and Folkman (1984)) where an individual learns of information with significant consequences (Giddens 1991:

113). The risk society framework is also relevant to residents' adaptation to the local-level siting process of Stoney Creek. The coping response could be seen as an attempt to preserve and rebuild one's ontological security (Giddens 1990). Beck (1992a; 1992b) and Giddens (1990; 1991) recognize this as reflexivity. In both the pre- and post-siting processes residents employed a range of coping strategies to deal with their concerns (protect their cocoons), however emotion-focused coping strategies were used with more frequency at both points in time. These included issues such as: 'out of site, out of mind'; 'better things to do'; 'have a blind faith that the government is watching'; 'there's not much I can do about it'; and, 'not in the newspaper every time you look around', to name a few. This may be further characterized as representing pragmatic acceptance, turning inwards, sustained optimism, denial and/or distancing (Beck 1992a; Lazarus & Folkman 1990; Giddens 1990; 1991). Lazarus and Folkman (1980; 1987) suggest emotion-focused coping predominates when stressful conditions are viewed as uncontrollable. This can be attributed in part to residents perceived lack of opportunity to truly influence the siting process and points to the importance that the worldview equity (e.g., fairness in the siting process) plays in the experience of psychosocial effects as well as the coping response.

Worldviews were revealed in ways respondents talked about specific issues. Worldviews are also inherently value-laden and specific to residents' local environment in relation to the landfill. The issue of equity mainly developed out of residents' responses concerning the siting process. As discussed previously,

residents focused on procedural equity, or the fairness of the siting processes. The role of the MOE as a legislator who guided the EA process of the East Landfill site is central to this issue. The MOE's decision to approve the facility without an EA hearing, despite community opposition, caused residents to view the pre-siting process as unfair. Some residents saw money as a dictator of power in the siting process since Taro is "a big outfit and money talks" ("Megan", Stoney Creek, resident). Residents also expressed concern about social and spatial equity including: (1) siting another landfill in a residential community; and, (2) the landfills proximity to the Niagara Escarpment/Red Hill Valley/United Nations Biosphere Reserve, all which are environmentally sensitive areas. In addition, the perceived inequitable distribution of compensation in the area stimulated concern among residents. Respondents felt households were secretly being paid off to keep issues quiet. Research suggests that compensation is usually ineffective, especially when it is offered in an inappropriate manner (Armour 1992; Rabe 1992; Kunreuther et al. 1993). Thus, the perception that the pre-siting process was unfair from the outset reinforced the notion that landfills are unsafe and risky. Armour (1992: 32) suggests that, "people will not willingly consider the merits of a decision if they feel they have been treated unfairly in the process of reaching it".

Residents' views on trust also shaped their perceptions of the facility (Kaperson et al. 1992; Groothuis & Miller 1997; Slovic 1999). The development (or loss) of trust is based on the relationships between the government, industry

and host community (Slovic 1999; Baxter et al. 1999). Opposition in the pre-siting process was motivated in part because residents did not trust the proponents, government or technology, thus confirming with what others have suggested (Armour 1992; Kunreuther et al. 1993; Johnson & Chen 1995; Covello 1996; Leis 1996; Slovic 1999). First, trust was directly related to the perceived poor track record of Philip Environmental Inc. (the parent company) and Taro's previous operation of the West Landfill site in the Stoney Creek community. Residents viewed the corporation as incapable of protecting the community against environmental risk and dealing with threats to ways of life and core values of the community (e.g., health) (Laird 1989).

Trust in industry/government was also related to the key facility-related events that occurred during the post-siting process. This points to the interrelatedness of context and collective in the experience of psychosocial effects. In Stoney Creek, negative events took the form of incidents such as discoveries of errors and mismanagement. These events threatened residents' core values, worldviews and ways of life. In particular, residents valued good health. Further, Taro's (and Taro's Community Liaison Committee) perceived lack of regard for community concerns deteriorated the community's already damaged trust. Residents felt the company underplayed threats to their everyday life and the values of the community. As a result, the landfill was seen as less tolerable and not safe. In addition, the MOE investigation into the CyanoKEM controversy

caused the community to question the adequacy of the regulations respecting landfills posed by the government.

This confirms not only that trust is difficult to regain once lost, but also the importance of how that trust is lost and never regained (Covello 1996; Slovic 1999; Kaperson & Kaperson 1996; Baxter & Greenlaw 2005). For example, distrust remains in Stoney Creek, a decade after the initial siting process, because residents continue to worry about the nature of the material allowed to enter the site. Hadden (1991) asserts that the lay public trusts process rather than evidence (the latter being highly valued by the scientific community). Hadden (1991: 50) concluded, "...if people accept the ways in which decisions are made, they will accept the decisions themselves...". Despite the fragility of trust, research suggests that trust between industry/government and the public can be re-established within the siting process by admitting past mistakes, avoiding exaggerated promises and highlighting past successes (Kunreuther et al. 1993). However, the negative facility-related events seem to be more visible or noticeable to residents than positive events that occurred, thus confirming what others have suggested in the risk perception literature (i.e., public views are based on consequences) (e.g., Slovic 1999); that is visible events carry more weight in shaping attitudes because they are well-defined and specific. For instance, while residents offered a few positive perceptions of the landfill such as the community benefits Taro (through their Community Trust Grants and recreational facility) have contributed to the City of Stoney Creek, they were quick to note the

problems with these benefits (e.g., safety). Here, the negative events carried much more weight than the positive events among the community (Slovic 1999). Thus, it may be argued that actors need to communicate successful practices more often and with more detail.

Stigma also played an important role in Stoney Creek where residents were concerned about their community being "labeled" and not being able to sell their home. Most residents also expressed concern about the dread consequences and involuntariness of exposure, the unequal distribution of impacts, the unbounded nature of impacts (i.e., magnitude and persistence are unknown), the improper management of the facility, and the unnatural nature of the issue (e.g., location near the Niagara Escarpment); all of which are identifying features of the place-stigmatizing effect of environmental stressors in the literature (Slovic 1987; 2000; Gregory et al. 1995; Johnson & Chen 1995; Renn & Rohrmann 2000; Gregory & Satterfield 2002). As Edelstein (1988) suggests, waste disposal facilities are inherently stigmatizing.

Finally, the findings of this study point to the importance of the 'shared experience' in the process of appraisal as well as reappraisal (Berger & Luckman 1966). In the pre-siting process residents formed social networks to deal with the siting of the Taro East Landfill site. The study by Wakefield & Elliott (2003) identified social networks with friends and neighbours as Stoney Creek residents most effective and credible risk communication tools. According to Berger and Luckman (1966), these interactions, in part, constructed the meanings residents

attached to the landfill. This community support system empowered residents in the pre-siting process, particularly since many residents came together in order to organize against the site. Further, it can be logically assumed that having a social network made the community meetings more enjoyable and more effective because residents had a set of common experiences and meanings. However, residents expressed how the high turnover and residential growth of the community caused social networks to be severed over time. This deteriorated the community connectedness and explains why residents attended fewer community meetings and discussed the issue with friends and neighbours less frequently in the post-siting process (i.e., less interaction over time).

This leaves **compositional** factors (i.e., individual characteristics) as potentially important influences in interpreting the observed findings. Through the analysis of psychosocial impacts using logistic regression models, at-risk profiles were built. There are a number of mediating factors that contribute to each psychosocial outcome, alone and, most often, in combination with other factors. Further, the specific factors involved vary according to the stage of the siting process (pre-siting process vs. post-siting process). In the pre-siting process, socioeconomic status (SES) (measured as income and employment status) and level of emotional distress were important explanatory variables of outcomes. In particular, residents with an annual household income ≥$30,000, full-time employment and levels of emotional distress above the cut-point (0.36) for normal on the SCL-90 were more likely to report site-related concern, health concern,

daily life effects and coping responses (emotion- and problem-focused) in 1996. In addition, zone was an important explanatory variable in the 1996 models but this spatial gradient was not apparent in the 2002 models. A comparison of these results with the psychosocial literature on waste disposal facilities is difficult given the differences between studies in their definition of zonal distances for sampling exposed respondents. In general, the findings were similar to that of Milton (2, 3, 4, and 4.5km from the site) where residents closer to the recently approved site were more likely to experience psychosocial effects (Elliott et al. 1993).

In the post-siting process, dwelling tenure and type as well as gender were important explanatory variables for the retention of outcomes. That is, residents that lived in a detached home and owned the home were more likely to be concerned, experience daily life effects and employ emotion-focused coping. Dwelling tenure and type were identified as important variables in understanding concern around other noxious land uses as well (Dear & Taylor 1982). In terms of gender, these findings do not support those of other studies that report higher levels of psychosocial effects among women (Taylor et al. 1989; Flynn et al. 1994). Instead males were more likely to retain site-related psychosocial effects over time, specifically health concern and a problem-focused coping response. This may point to the role that males play in protecting the family unit against threats.

Overall, these findings reflect the key take-home messages of the community profile (Chapter 4). This profile indicated that the Stoney Creek community under study is essentially a middle-class neighbourhood comprised of young families that live in single-detached dwellings occupied by their owners. The profile also established that half the sample moved to the area while the Taro West Quarry (operated at the same site in Stoney Creek) was operating as a *landfill* and the Taro East Landfill site under study was operating as a *quarry* (prior to its conversion to a landfill). Thus, this is more than a case of NIMBY because over half of the residents moved into the community with the Taro West Landfill site already in existence and operating (i.e., poor public relations and a top-down siting process were also important factors; Decide-Announce-Defend Strategy). Hence, many residents had control over whether or not they lived in close proximity to a landfill. Second, it appears that financial stability played a role in the process of psychosocial effects in the pre-siting process. Considered in the context of risk society, a more economically advantaged community will be predisposed to maintaining their protective cocoons (Giddens 1990). This explains the substantial community opposition the site received in the pre-siting process. Further, almost half the respondents reported employing problem-focused coping strategies to protect their ontological security (Giddens 1990). Third, there was a high degree of homeownership of detached dwellings in the community under study, which was significantly related to the retention of outcomes over time. Purchasing a "home is the biggest investment most people

make in a lifetime", and the value of this purchase is further increased when one buys a home in which to raise their family (Cook 2004: 91). In the language of risk society, the home may represent one form of an individual's protective cocoon (Giddens 1990; 1991). Stoney Creek residents, therefore, had a great deal at stake and felt their routines of everyday life were being disrupted (e.g., threats to safety, stigmatized). This results in a sense that the world (people, places, and things in it) is no longer secure, and leads to the experience of psychosocial effects. Surprisingly, the presence of young children in the home did not emerge as a significant explanatory variable.

Results from this study reveal that contextual, collective and compositional factors are mutually interdependent in the process of reappraisal. Similarly, as Macintyre et al (2002) have suggested, focusing on one factor to the exclusion of the others is counter-productive, and will ultimately lead to a biased explanation. This form of conceptual thinking about place was useful in understanding the relationship between the local environment and human health in the case study of Stoney Creek because it allowed for a more holistic understanding of the processes that influence primary and secondary appraisal, and reappraisal. In particular, the results from this longitudinal study suggest that the specific factors involved vary according to the stage of the siting process (pre-siting process vs. post-siting process). This reinforces the place-effect of waste disposal as well as the importance that changes in place play in the process of stress and coping over time.

6.3 Methodological Contributions

Perhaps the most significant methodological contribution of this research was the integration of quantitative and qualitative methods to address the issue of changes over time in psychosocial impacts of exposure to a solid waste disposal facility. This study provides an example of the effective use of a mix-method research design where in-depth interviews inform the interpretation of survey results (Greene et al. 1989; Morgan 1998). This strategy for integrating quantitative and qualitative research approaches was useful for understanding an environment and health relationship because the scope of the investigation was widened, and insight was gained into why certain respondents experience greater psychosocial effects and how these effects are manifested. As a result, a more comprehensive study of residents' reappraisal of a solid waste disposal facility was conducted (Elliott & Baxter 1994; Greene & Caracelli 1997; Baxter 1997; Eyles 1998; Taskakkori & Teddie 1998; Dyck 1999; Moran-Ellis et al. 2006). In particular, the use of a large scale survey documented a great deal of information on the effects of the siting process, however the qualitative interviews provided additional insight into how people act in, and give meaning to their own lives; an understanding that could not have been achieved through quantitative methods alone. This helps to move beyond a narrow understanding of stress and coping as operationalized in other studies (e.g., Elliott et al. 1993).

6.4 Substantive Contributions and Policy Implications

Studies have typically shown higher levels of psychosocial effects in populations exposed to approved (opposed to existing) waste disposal facilities, indicating perhaps that psychosocial effects were more the result of anticipatory anxiety than actual impacts (Hadden 1991; Elliott et al. 1993; 1997; Elliott & Taylor 1996; Elliott 1998; Wakefield & Elliott 2000). The findings of this research suggest, however, that negative perceptions and concerns do not necessarily significantly decrease as residents live with a landfill over time. In the pre-siting process, residents concerns can be attributed in part to process issues (e.g., procedural equity), as suggested in the literature. However, threats to core values (e.g., safety/ character of area), ways of life (e.g., uncertainty) and worldviews (e.g., trust), as well as individual characteristics (e.g., SES) were also important in the experience of psychosocial effects (Section 6.2). In the post-siting process, however, Stoney Creek residents are more concerned about possible long-term health impacts related to the waste disposal activities. In addition, there is little change in the level of concern reported by residents. Here the experience of psychosocial effects can be attributed to process issues (lack of communication/involvement), poor operational practices/incidents (e.g., illegal dumping of toxic waste), the lack of a shared experience (e.g., loss of social networks) and threats to values (e.g., good health), ways of life (e.g., security of housing/investment in the area) and worldviews (e.g., trust) (Section 6.2). Finally, whether the situation was seen as controllable (Lazarus & Folkman 1990)

influenced whether problem- or emotion-focused coping was used. At both points in time, emotion-focused coping strategies was more frequently selected by residents. This points again to residents' lack of trust and control in the process and the actors involved.

The practical and policy significance of this study is highlighted when these findings are compared to the findings of the Milton study, the only other known longitudinal study that examined residents reactions before and after the siting of a landfill (Elliott et al. 1997). These sites were judged to be similar on the basis of type of exposure (chronic), source of exposure (point), and the nature of the contaminants (non-hazardous solid waste). Both sites are located in suburban, middle class neighbourhoods where there are high rates of homeownership and families. Based on the pre-siting process, the sites were also similar in terms of the level of community opposition, level of media attention and level of community awareness. However, they were judged to differ in terms of site history, the length of the siting process and amount of resident participation in the process (Elliott et al. 1997; Wakefield & Elliott 2000). The timing of these studies also differed. While both examine residents' reactions before and after the siting of a facility, the Stoney Creek study provides a point on the continuum prior to the Milton study whereby residents' reactions were examined during the decision-making process (i.e., at the peak of uncertainty) as opposed to immediately after the decision to site the landfill had been made.

Overall, Elliott et al (1997) concluded that negative perceptions and concerns decreased (and positive perceptions increased) as residents lived with the landfill. Level of concern at Milton (74%) was high compared to literature at baseline however, this level significantly decreased over time (50%). This finding confirms the level of controversy and debate over the introduction of the Milton site among the community. The initial survey coincided with the unsuccessful termination of a 20-year battle by local residents opposed to the siting of this facility. In Milton, the landfill was feared due to anticipated effects (on health, nuisance, and property values), as well as the perceived loss of control in the siting process. At follow-up there was a temporal gradient of change indicating that the trend towards more positive perceptions and attitudes was concurrent with the landfill construction and operation. The authors suggest several key explanations for the relative success of the facility in terms of acceptance of the facility in the community (Elliott et al. 1997). First, even though a long and contentious siting process preceded the final decision to build the landfill, the process genuinely involved and empowered residents. Under the legislation of the EA Act (RSO 1990), the MOE decided to call for a public hearing in front of an Environmental Assessment Board (a quasi-judicial tribunal of provincially appointed hearing officers). While the final decision was made by the Board, the terms and conditions imposed by Board ensured the community concerns were addressed both in the pre- and post-siting processes. For example, the Board established a full-time, funded Citizens Advisory Committee, a public review

committee, and various design considerations to minimize landfill impacts on the residents. Not only did these procedures involve the public, but also they established a foundation of trust, ensured equity and adequately dealt with threats to residents' core values and ways of life.

At baseline, 52% of Milton residents mentioned health-related concerns but this frequency also significantly declined over time (36%). At baseline residents reported stress, worry and anxiety about the landfill. However, allergy symptoms, headaches and skin rashes (short-term) were mentioned at follow-up. Through successful operating/management practices residents' anticipated effects (health impacts/land value effects) were not realized in the post-siting process. As a result, the unknown landfill was acknowledged by the community as a state-of-the-art facility. These practices built on the already established trust between the industry/government and the community.

Reported effects on daily life, while low, increased over time at the Milton site (11% to 19%). At baseline these effects were attributed to the siting process: 'makes me mad; lived here for 20 years; disruption of friendships; sale of house; absorption of monetary loss' (30% at Stoney Creek). At follow-up effects were related to obtaining sufficient, good quality water, increased truck traffic and having to pick up blowing garbage.

There were no profound effects of the landfill on emotional distress and the reporting of somatic complaints over time in Milton. Percentages scoring above the normal cut-point for normal on the SCL-90 (.36) were low (32% in

Time 1 and 25% in Time 2) compared to population norms (Derogatis 1973) and to the findings of related studies (Elliott et al. 1993). In terms of action (i.e., individual action, group action and moving action), 83% of respondents mentioned some for of action at baseline, while this significantly reduced to 52% over time.

The comparison of the Milton findings to those of Stoney Creek described earlier confirms that the experience of environmental stress as well as coping responses are mediated by a range of contextual, collective and compositional factors, and that the specific factors involved vary by site. While the experience of psychosocial impacts cannot be divorced from the local environment within which they occur (White 1981; Edelstein 1988), comparing these two studies is useful for making informed decisions about managing these facilities and for successfully siting future facilities. First, this thesis recommends effective community participation at all stages of the siting process. Effective participation not only refers to keeping the public informed of the siting progress (e.g., meetings, open houses, newsletter, community groups), but also involving them directly in the decision-making process (e.g., in the deciding of alternatives and the public hearing) (Armour 1992; Rabe 1992; Kuneuther et al. 1993; Petts 1995). All affected groups should be meaningfully involved in the siting process and they should be given the resources needed for effective participation (Kuneuther et al. 1993). These practices will educate the affected groups about the proposal, give some control back to the community hosting the proposed landfill and

involve their best interests (e.g., good health, values). Further, it is just as instrumental to meaningfully involve the public early in the siting process, as it is to consistently involve them throughout the post-siting process. While the pre-siting process for waste disposal facilities often includes a number of opportunities for expressing community views (e.g., meetings), it is essential that these concerns be incorporated into the decision-making process. In addition, community consultation needs to continue once a facility is operational in order to up-date residents on the status of the landfill and involve them in future decisions. Moreover, public participation encourages residents to form social networks, which are a key factor in mitigating negative impacts and coping with a facility.

In addition, public participation can reinforce trust and equity in the siting process by building the relationship between government/industry and the community. In cases where residents do not trust the proponents, as in the case study of Stoney Creek, Kunreuther et al (1993) suggest trust can be re-established within the siting process by admitting past mistakes, avoiding exaggerated promises and highlighting successes. However, the ability of the operator and authorities to manage and monitor the operation of the facility is also an important practice for competent siting. Preventing the occurrence of potential concern-evoking events/incidents can only increase public acceptance of facilities. Working for geographical fairness should also be a siting goal for the purposes of equity (Kunreuther et al. 1993). In the case study of Stoney Creek, perhaps it is inappropriate to locate two facilities in a single locale.

Proximity is another important consideration when siting a landfill. The Stoney Creek and Milton study show how in the pre-siting process residents closer to the site experience higher levels of psychosocial effects, while in the post-siting process psychosocial effects are experienced more uniformly. Thus, strategies to involve the public must consider this relationship. Compensation measures, however, should be used with caution, because on its own it is usually ineffective and only fosters issues of inequity (Armour 1992; Rabe 1992; Kunreuther et al. 1993). Instead the siting principles and practices mentioned here should be considered simultaneously. This study provides an example of how focusing on one principle (e.g., public consultation during the development of the EA document) is counterproductive and problematic.

Lastly, the pre- and post-siting processes of waste disposal facilities must be flexible and problems in the siting process must be addressed as they occur. It is important to remember that the process of reappraisal is ongoing and further changes in context, composition and collective still have the potential to influence individual perceptions and coping responses. For example, distrust and uncertainty remain in Stoney Creek, a decade after the initial siting process, because residents continue to worry about the nature of the material being allowed to enter the site. Further, the in-depth interviews reveal how many Stoney Creek residents were worried about the threat of receiving Toronto's trash as a result of a terminated contract with Michigan (currently Toronto ships its trash to a landfill in Michigan, City of Toronto 2006). These key issues need to be confronted by

the stakeholders involved to promote trust and credibility between residents, industry and government regulators and increase the likelihood of successful siting. In particular, these corrective efforts need to be addressed in Stoney Creek in order to improve the relations between the parties. However, this also demonstrates how a potential change in operating practices has the potential to uncover latent concerns.

6.5 Directions for Future Research

The investigation of residents' reappraisal of the Taro East Landfill site has contributed to the existing knowledge in this area in a number of ways. However, this research also points to a number of areas in which more research is needed. First, additional longitudinal studies that measure residents' reactions before and after the siting of a landfill are needed in order to better understand the process of reappraisal and factors that mediate this process. In particular, more needs to be known of other contexts within which psychosocial impacts occur. For example, this research examined one of the last siting processes to take place in Ontario prior to the revision of the Environmental Assessment legislation in 1997 under the newly elected (at the time) neoconservative Provincial government (Environmental Assessment and Consultation Improvement Act 1996). It would be instructive to compare the findings of this study to other sites operating under a new legislative framework to explore if the outcomes are also different.

Second, further examination of industry materials for the use of risk communication would be useful. While this study reviewed the use of these documents/sources of information in the siting process of the Taro East Landfill site, future studies should try to determine the effectiveness of these documents as risk communication tools. This analysis could be integrated with in-depth interviews with key stakeholders (industry, government, community, liaison committee group) in order to understand how these tools are viewed as sources of risk information, as well as the rationale behind these documents.

Thirdly, future research should try to understand the process of coping in more depth, particularly why certain respondents use one type of coping response (e.g., pragmatic acceptance) over another and how this mitigates the experience of psychosocial effects. Obtaining information about the nature and application of coping strategies employed by residents is needed to guide strategies to reduce the adverse effects of environmental stressors.

Finally, future research needs to work in partnership with legislative bodies to develop best practices for siting environmentally sensitive land uses. This includes the development of management and risk communication strategies to site state-of-the-art facilities with the least amount of conflict. This research, together with the account provided by Elliott et al (1997) of the siting process at Milton, can be used to inform and develop policy for siting future, similar facilities.

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APPENDIX 1

LETTER OF INTRODUCTION TO THE QUANTITATIVE SURVEYS

Date

Interviewee Name
Interviewee Address

Dear Sir or Madam:

Your household has been randomly chosen to participate in a study of public attitudes towards quality of life in communities in southern Ontario. The study is being conducted by McMaster University and is funded by a national research grant.

An interviewer from the Institute of Social Research at York University will be phoning you in the next few days and will ask a selected person in your household to complete a 20 minute telephone survey. A range of questions will be asked dealing with attitude toward your local area, the environment, health and quality of life.

All information will be strictly confidential. The data will be recorded, analyzed and reported in ways that guarantee your anonymity.

The results of this research will be used to increase our understanding of factors (e.g., environmental factors, health-related factors, neighbourhood-related factors) affecting our quality of life. These are issues of growing importance to us all. The research findings will also have practical value for agencies responsible for planning and policy decisions.

Thank-you in advance for your cooperation and participation in this important study.

Yours sincerely,

Kim Hunter
Research Assistant
Quality of Life Project
(905) 525-9140 x23533

APPENDIX 2

GENERAL QUESTIONAIRE FOR STAGE ONE AND TWO

INTRODUCTION

Hello—my name is [fill name] and I'm calling from York University's Research Centre. We are conducting a study about the quality of life in communities in southern Ontario. You may recall that a few days ago you or someone in your household got a letter describing the study. We would greatly appreciate your views or the views of someone in your household. Before I start, I want to make sure I dialed the correct number…

Is this…

Would you please tell me if you are 18 years of age or older?

In order to determine who to interview, I have to ask a few questions about the adults living there…

[proceed with respondent selection]

[INTERVIEWER: Record respondent's gender]

Do you still live on…?
[address verification for site and zone assignment]

SECTION A – ATTITUDES TOWARD THE AREA WHERE YOU LIVE

(a1a) I'd like to begin by asking you what you LIKE about the area where you live. First, what's the MOST IMPORTANT thing you LIKE about the area where you live?

- mention
- no mention
- mention sites
- don't know
- refused

(a1b) And what is the SECOND MOST IMPORTANT thing you LIKE about the area where you live?

- mention
- no mention
- mention sites
- don't know
- refused

(a1c) And what is the THIRD MOST IMPORTANT thing you LIKE about the area where you live?

- mention
- no mention
- mention sites
- don't know
- refused

(a2a) Now I'd like to ask what you DON'T LIKE about the area where you live. First, what's the MOST IMPORTANT thing you DON'T LIKE about the area where you live?

- mention
- no mention
- mention sites
- don't know
- refused

(a2b) And what is the SECOND MOST IMPORTANT thing you DON'T LIKE about the area where you live?

- mention
- no mention
- mention sites
- don't know
- refused

(a2c) And what is the THIRD MOST IMPORTANT thing you DON'T LIKE about the area where you live?

- mention
- no mention
- mention sites
- don't know
- refused

(a3) In general how satisfied are you with your area as a place to live? Would you say you are VERY satisfied, SOMEWHAT satisfied, NOT TOO satisfied, or NOT AT ALL satisfied?

- VERY satisfied
- SOMEWHAT satisfied
- NOT TOO satisfied

- NOT AT ALL satisfied

(a4) If you could change just one thing about this area what would it be?

- nothing I would change
- no mention
- don't know
- refused

SECTOIN B – GENERAL HEALTH STATUS

(b1) To help us understand the quality of life in a community, we like to find out how people have been feeling lately and to ask about their health in general. Compared to the other people your age, would you say your health is excellent, very good, good, fair, or poor?

- excellent
- very good
- good
- fair
- poor

(b2) How SATISFIED are you with your health in general? Would you say you are VERY SATISFIED, SOMEWHAT satisfied, NOT TOO satisfied, or NOT AT ALL satisfied?

- VERY satisfied
- SOMEWHAT satisfied
- NOT TOO satisfied
- NOT AT ALL satisfied

SECTION C – SOMATIC COMPLAINTS

(c1a) Now I'm going to read you a list of some general health problem. For each, please tell me if it has bothered you recently. First, over the past two WEEKS, have you been bothered by headaches?

- yes
- no/not at all
- don't know
- refused

(c1b) Have they bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c2a) Over the past two WEEKS, have you been bothered by faintness or dizziness?

- yes
- no/not at all bothered
- don't know
- refused

(c2b) Has it bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c3a) Over the past two WEEKS, have you been bothered by pains in the heart or chest?

- yes
- no/not at all bothered
- don't know
- refused

(c3b) Have they bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c4a) Over the past two WEEKS, have you been bothered by pains in the lower back?

- yes
- no/not at all bothered
- don't know
- refused

(c4b) Have they bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c5a) Over the past two WEEKS, have you been bothered by nausea or upset stomach?

- yes
- no/not at all bothered
- don't know
- refused

(c5b) Has it bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c6a) Over the past two WEEKS, have you been bothered by soreness of your muscles?

- yes
- no/not at all bothered
- don't know
- refused

(c6b) Has it bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c7a) Over the past two WEEKS, have you been bothered by trouble getting your breath?

- yes
- no/not at all bothered
- don't know
- refused

(c7b) Has it bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c8a) Over the past two WEEKS, have you been bothered by hot or cold spells?

- yes
- no/not at all bothered
- don't know
- refused

(c8b) Have they bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c9a) Over the past two WEEKS, have you been bothered by numbness or tingling in parts of your body?

- yes
- no/not at all bothered
- don't know
- refused

(c9b) Has it bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c10a) Over the past two WEEKS, have you been bothered by a lump in your throat?

- yes
- no/not at all bothered
- don't know
- refused

(c10b) Has it bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c11a) Over the past two WEEKS, have you been bothered by weakness in parts of your body?

- yes
- no/not at all bothered
- don't know
- refused

(c11b) Has it bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c12a) Over the past two WEEKS, have you been bothered by heavy feelings in your arms or legs?

- yes
- no/not at all bothered
- don't know
- refused

(c12b) Has it bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c13a) Over the past two WEEKS, have you been bothered by rashes or other skin conditions?

- yes
- no/not at all bothered
- don't know
- refused

(c13b) Have they bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know

- refused

(c14a) Over the past two WEEKS, have you been bothered by poor appetite?

- yes
- no/not at all bothered
- don't know
- refused

(c14b) Has it bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c15a) Over the past two WEEKS, have you been bothered by fatigue or tiredness?

- yes
- no/not at all bothered
- don't know
- refused

(c15b) Has it bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c16a) Over the past two WEEKS, have you had trouble getting up in the morning, even if you've had enough sleep?

- yes
- no/not at all bothered
- don't know
- refused

(c16b) Has it bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c17a) Over the past two WEEKS, have you been bothered by loss of sleep due to worry?

- yes
- no/not at all bothered
- don't know
- refused

(c17b) Has it bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c18a) Over the past two WEEKS, have you been bothered by stress more than usual?

- yes
- no/not at all bothered
- don't know
- refused

(c18b) Has it bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know

- refused

(c19a) Over the past two WEEKS, have you been bothered by feelings of unhappiness or depression?

- yes
- no/not at all bothered
- don't know
- refused

(c19b) Have they bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

(c20a) Over the past two WEEKS, have you been bothered by lack of concentration?

- yes
- no/not at all bothered
- don't know
- refused

(c20b) Has it bothered you a little bit, moderately, quite a bit or have you been extremely bothered?

- a little bit
- moderately
- quite a bit
- extremely bothered
- don't know
- refused

SECTION D – IMPORTANT LIFE EVENTS

(d1) Sometimes major events in our life can affect our quality of life, so I'd like to ask you some important things that might have happened to you in the past twelve months. First, over the past twelve months, did you lose a job?

- yes
- no (includes not working)
- don't know
- refused

(d2) Over the past twelve months, did you have a serious illness or personal injury?

- yes
- no
- don't know
- refused

(d3) Over the past twelve months, did anyone very close to you, other than husband, wife, or partner, die?

- yes
- no
- don't know
- refused

(d4) Over the past twelve months were you divorced or separated from your spouse or partner?

- yes
- no
- not married/no spouse
- don't know
- refused

(d5) Over the past twelve months did your spouse or partner lose a job?

- yes
- no
- don't know
- refused

(d6) Over the past twelve months did your spouse or partner die?

- yes
- no
- don't know
- refused

SECTION E: SITE SPECIFIC AWARENESS, CONCERN AND ACTION

Now I would like to ask you a bit more about the area you live in.

(e1) Are you aware of the (proposed) landfill site?

(e2) Do you have any concerns about the site?

- yes
- no
- don't know
- refused
-

(e3a) What is your MAJOR concern about the site?

- mention
- no mention
- don't know
- refused

(e3b) What is your SECOND major concern about the site?

- mention
- no mention
- don't know
- refused

(e3c) What is your THIRD major concern about the site?

- mention
- no mention
- don't know
- refused

(e4d) How certain are you that your concerns will be addressed?

- very certain
- fairly certain
- somewhat certain
- not at all certain
- don't know
- refused

(e4e) Who do you think will address your concern?

INTERVIEWER: Do not read list

- local politicians
- public health department
- doctors
- provincial politicians
- study group (specific group associated with the developer)
- community opposition group / SCRAP Stoney Creek Residents Against Pollution
- industrial officials
- local citizens group/lobby group
- combination
- other
- don't know
- refused

(e5) Are any of the concerns you mentioned likely to affect your daily life in any way?/ Have any of the concerns you mentioned affected your daily life in any way?

- yes
- no
- don't know
- refused

(e5a) In what way are the concerns you mentioned likely to affect your daily life in any way?/ In what way have the concerns you mentioned affected your daily life?

- mention
- don't know
- refused

(e6) INTERVIWER: IF ANY OF THE CONCERNS MENTIONED ARE CLEARLY HEALTH RELATED, CHOOSE "YES" FOR THE NEXT QUESTION. IF YOU'RE NOT SURE, READ THE QUESTION…
Do you consider any of the concerns you just mentioned to be HEALTH related?

- yes
- no
- don't know
- refused

(e7) Over the past two years, have you ever considered moving because of the proposed site?

- yes
- no
- don't know
- refused

(e8) Have you taken any steps toward moving such as contracting a real estate agent or putting your house up for sale?

- yes
- no
- don't know
- refused

(e9) What steps have you taken?

INTERVIEWER: If R gives multiple answers, code ONLY THE LOWEST number)

- tried to rent or sell house
- contacted real estate agent
- actually looked for other housing
- discussed moving with family
- considered moving away
- other
- don't know
- refused

(e10) If you were to move, would you move to another location IN this area, or to a location OUTSIDE this area?

- to another location IN this area
- to a location OUTSIDE this area
- don't know
- refused

(int1) Since you first became aware of the proposed site have you found yourself doing any of the following as a way of dealing with the issues?/ Since the site has been in operation have you found yourself doing any of the following as a way of dealing with the issues?

- to continue

(e11a) Turned to work or a substitute activity to take your mind off things?

- yes
- no
- don't know
- refused

(e11b) Tried to get the people responsible to change their minds.

- yes
- no
- don't know
- refused

(e11c) Talked to someone to find out more about the situation.

- yes
- no
- don't know
- refused

(e11d) Just hoped something would happen to make the whole situation go away.

- yes
- no
- don't know
- refused

(e11e) Went on as if nothing was happening.

- yes
- no
- don't know
- refused

(e11f) Told yourself you probably wouldn't even notice the landfill is there.

- yes
- no
- don't know
- refused

(e11g) Kept your feelings to yourself.

- yes
- no

- don't know
- refused

(e11h) Told yourself the landfill will probably be managed safely and effectively.

- yes
- no
- don't know
- refused

(e11i) Made a plan of action and followed it.

- yes
- no
- don't know
- refused

(e11j) Talked to someone who could do something concrete about the problem.

- yes
- no
- don't know
- refused

(e11k) Told yourself that other communities with industrial waste landfills have not experienced any health or environmental problems.

- yes
- no
- don't know
- refused

(e11l) Talked to someone about how you were feeling.

- yes
- no
- don't know
- refused

(e11m) Stood your ground and fought for what you wanted.

- yes
- no

- don't know
- refused

(e11n) Told yourself that your community will probably not be affected by the landfill.

- yes
- no
- don't know
- refused

(e11o) Tried to come up with a couple different solutions to the problem.

- yes
- no
- don't know
- refused

(e11p) Just accepted it, since nothing could be done about it.

- yes
- no
- don't know
- refused

(e11q) Just didn't let it get to you.

- yes
- no
- don't know
- refused

(e11r) Wished it would all just be over with.

- yes
- no
- don't know
- refused

(e12) Have you read about the proposed site in the newspaper?

- yes
- no
- don't know

- refused

(e13) Did you read any of the Environmental Assessment documents prepared as part of the application process for approval of the landfill?

- yes
- no
- don't know
- refused

(e14) Have you discussed the proposed site with friends or neighbours?

- yes
- no
- don't know
- refused

(e15) Have you attended a public meeting organized by government or industry officials related to the proposed site?

- yes
- no
- don't know
- refused

(e16) Have you attended a meeting organized by the local citizens group at which the proposed site was discussed?

- yes
- no
- don't know
- refused

(e17) Do you belong to a local citizens group which deals with the proposed site?

- yes
- no
- don't know
- refused

(e18) Have you telephoned, written or spoken to politicians and/or government staff about your concerns regarding the proposed site?

- yes

- no
- don't know
- refused

(e19) Have you spoken to staff at Taro or Phillips about your concerns related to the proposed site?

- yes
- no
- don't know
- refused

SECTION F: SOCIODEMOGRAPHIC QUESTIONS

(sd1) In what year were you born?

(sd2) What is the highest level of education you have completed?

(sd3) At present, are you married, living with a partner, widowed, divorced, separated, or have you never been married?

(sd4) Are you presently working for pay in a full-time or in a part-time job, are you unemployed, retired, a homemaker, a student, or something else?

(sd5) What is your main occupation?

(sd6) Could you please tell me how much income you and other members of your household received last year?

(sd7) How many years have you lived at your current address?

(sd8) How many years have you lived in the area?

(sd9) Is your dwelling owned or rented?

(sd10) Is your dwelling:

- single family detached
- single family attached (e.g., townhouse)
- duplex, triplex or quad. or apartment building < 5 stories
- apartment building > 5 stories
- other
- don't know
- refused

(sd11) Including yourself, how many people live in your household?
(sd12) How many people live in your household and are 17 years of age or younger?

1996 Survey also asked:

(sd13) A researcher from McMaster University may be contacting you in the future to ask you to participate in a face-to-face interview so you can talk more about the quality of life in your area.

Would you be interested?

- yes
- no
- don't know
- refused

END.

APPENDIX 3

LETTER OF INTRODUCTION TO THE QUALITATIVE IN-DEPTH INTERVIEWS

September 1, 2006

Interviewee Name
Interviewee Address

Dear Sir or Madam:

Your household has been chosen to participate in a follow-up study of public attitudes towards quality of life in communities in southern Ontario. This study is being supervised by Dr. Susan Elliott of the Geography and Earth Sciences Department at McMaster University. Since you also participated in the 1996 and 2002 surveys I will be able to see how your perspective has changed over time. The study is being conducted by McMaster University and is funded by a national research grant. This research has been approved by the McMaster Research Ethics Board.

I will be phoning you in the next few days and will ask if you are willing to take part in an interview at a time that is convenient for you. A range of questions will be asked dealing with attitudes toward your local area, the environment, health, and quality of life.

All information will be strictly confidential. The data will be recorded, analyzed, and reported in ways that guarantee anonymity.

The results of this research will be used to increase our understanding of factors (e.g., individual, community, social, and environmental) affecting our quality of life. These are issues of growing importance to us all. The research findings will also have practical value for agencies responsible for planning and siting environmental land uses.

Thank- you in advance for your cooperation and participation in this important study.

Sincerely,

Jessica Sousa
Master's Student
Department of Geography and Earth Sciences
McMaster University
(905) 525-9140 ext. 24815

APPENDIX 4

IN-DEPTH INTERVIEW CHECKLIST

In-Depth Interview Checklist

1. How long have you lived here (at this address)?
   - Always in this home?
   - Where did you live before?
   - Why did you move to here?

2. What do you consider as your neighbourhood?
   Probe:
   - Your block
   - Two streets over in all directions
   - The larger area

3. What do you look for in a neighbourhood in general?
   Probe:
   - Clean
   - Rural/Quiet
   - Close/Convenient/Open
   - Near School
   - Hamilton born/raised/family
   - People/Friends/Neighbours
   - Young/Neighbourhood
   - House Price
   - Safe
   - Scenery
   - Other

4. Why did you choose to live in this neighbourhood (what in particular do you like about this neighbourhood)?
   Probe:
   - Clean
   - Rural/Quiet
   - In suburb, but close to city
   - Close/Convenient/Open
   - Near School
   - Hamilton born/raised/family
   - People/Friends/Neighbours
   - Young/Neighbourhood
   - House Price
   - Safe
   - Scenery
   - Other

5. What don't you like about your neighbourhood?

Probe:
- Taro Dump/Landfill specifically (either)
- Pollution in general
- Traffic
- Other_____

6. Is there anything you would change about your neighbourhood?
Probe:
- Taro
- Pollution
- Traffic
- Social Char'
- Physical Char'
- Why?

7. Has your satisfaction with the neighbourhood changed over time?
-Why?

8. Would you say that the landfill offers anything positive?
- Like what?
Probe:
- Takes care of the trash problem
- Provides Jobs
- Taro Trust
- Sports Facility

9. So would you say you feel better (or worse) about the site since it was first proposed and began operation?
- Why?
    - Design (way it is laid out/never know it is there)
    - operation of the site
    - less of a threat
    - learned to live with it
    - got use it
    - government is protecting us
    - more important things in life
    - can't do anything about it

10. …I was wondering if you had any concerns about it?

11. What are some of your specific concerns/nature of your concerns?
Probe:
    - proximity

- location
- health/safety
- Management (lack of trust for Taro/government)
- Uncertainty (material entering site/compensation)
- Financial (land values/stigma/compensation)
- Nuisance (visual effects/trucks/traffic)
- Environmental (pollution: air/water quality/noise/odors)

12. Has your level of concern changed over the last few years?
So are you more/less concerned about the landfill?
Why?
    - have more info
    - educated more
    - concern-evoking events
    - moved on (more important things)

13. Are these concerns affecting your daily life?
How?
    - health (short-term/long-term)
    - annoyance
    - noise from increased truck flow
    - sale of house
    - disrupts friendship

14. So first, have you considered or taken steps towards moving from the neighbourhood because of the landfill?
    - Are thinking about it now
    - More important things in life

15. Do you discuss your concerns about the landfill with friends/family/neighbours?
    - Why?
        - Does this make you feel better?
        - Does it make you feel like your doing something?
        - Do you think it will lead to action?

16. Have you been interacting with your friends etc. more or less than before?

17. Have you intended any meetings?
Citizen's groups?
Government?

18. Would you say you have attended them more or less than a few years ago?

19. Have you contacted the government or politicians about your concerns?

20. More or less then before?

21. So where do you get more of your information about the site?
    - Newspaper
    - Friends
    - Newsletter
    - Meetings
    - Technical Reports
    - Other

22. Do you feel you have enough information?

23. Compared to the other people your age, would you say your health is excellent, very good, good, fair, or poor?

24. How satisfied are you with your health in general? Would you say you are very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied?

25. Is there anything else you would like to say?

APPENDIX 5

MEMBER CHECKING
FEEDBACK DOCUMENT AND RESPONSE LETTER

Date

Respondent's Address

Dear :

You may remember taking part in an interview with me in the Fall about your views of the Taro landfill. First, I just want to thank you again for your participation in this study. Your time as well as the information you provided was extremely valuable. I'm writing today just to share with you a summary of some of the **preliminary results** of the research; please note that this is a summary of the overall findings; not a summary of your individual interview. I would really appreciate it if you could please read over the summary and answer the two brief questions attached. I have provided you with a **self addressed stamped envelope** which you can use to return your responses to me, at your convenience.

Again, thanks so much for your participation and if you have any further questions or comments about the summary, please do not hesitate to contact me by email (sousajl@mcmaster.ca).

Summary

The majority of respondents reported being satisfied with the local area as a place to live, highlighting many things they liked about the area, including: nearby schools, having family and friends nearby, having 'the best of both worlds' (i.e., country and city life), and, more recently, having amenities nearby. Some reported being less satisfied due to a loss of privacy as a result of the tremendous growth the community has undergone over the years. Other factors included taxes, increased traffic, and the absence of heritage aspects and a true sense of community. The landfill, for the most part, was not mentioned as a feature of dislike until after it was probed by the interviewer. Once probed, several respondents did mention it as a feature they would change about their local area if they could. Reference was made to the past where residents mentioned being opposed to the siting, wishing the east quarry would have been regenerated (e.g., into a golf course) instead. Many positive aspects were also mentioned about the landfill despite the original opposition including, the community trust fund set up by Taro and the recreational facility that has been built over the capped Taro West Landfill. Several respondents, however, questioned the safety of the recreational facility and due to the previous illegal dumping of hazardous material, as well as the gases that are being released from the ground.

The main focus of concern was related to health, more specifically long-term health. This included long-term health concerns for the Stoney Creek residents' living to the north of the site, as many respondents explained that the water table flows in this direction impacting the ground and agriculture. In addition, there

were long-term health concerns as a result of events that occurred during the early years of the landfill's operation, including the illegal dumping events and the leaking of leachate. These events were also explained to destroy the respondents' trust toward the agencies involved. A few felt bitterness towards Taro with respect to the lack of both community involvement and communication of information (community relations) since the onset of the East Landfill's siting process.

In the end, most reported responses related to a cognitive reappraisal of the site in the form of adaptation; that is, people are just getting on with their lives. Some respondents reported that they still attended meetings about the landfill, but the majority reported them to be 'unproductive' and 'a waste of time'. Many sources of information about the landfill were outlined in the interviews. The majority considered the newspaper, in particular The Stoney Creek News, to be their main source of information. Other sources of information included the Taro Newsletter, friends and neighbours, and the television.

Sincerely,

Jessica Sousa
Master's Student
Department of Geography and Earth Sciences
McMaster University

Encl. Feedback on In-depth Interview Summary Document

Feedback on In-depth Interview Summary

Please take a few minutes to answer the following questions.

Is the attached summary an accurate reflection of your general perspective?
Yes

No

Is there anything you would like to clarify or alter in the summary document? Please provide details.

Thank you for your feedback.
Please mail your comments to Jessica Sousa
[Address]