

RESIDENTS' PERCEPTIONS TOWARDS ASBESTOS CONTAMINATION OF LAND AND IT'S IMPACT ON RESIDENTIAL PROPERTY VALUES

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ABSTRACT

Contaminated land issues have become more contentious with the introduction of environmental legislation in many western countries and the subsequent rise in the number of damage claims from land contamination that often result in litigation.

This paper summarises the results of a study that focuses on residents' perceptions towards a specific type of land contamination: asbestos contamination. In particular, the study investigates the attitudes and reactions of property owners living in a case study neighbourhood towards living on or near asbestos-contaminated land and how this might impact on property values. The results will be of particular interest to affected landowners, local authorities that have jurisdiction over the land, and valuers where compensation claims are being made against such property.

Keywords: Site contamination, asbestos, stigma, property values, public opinion surveys.

INTRODUCTION

Contaminated land¹ that represents potential hazards to human health and safety may cause property values to diminish due to the existence of "widespread public fear" and "widespread public perceptions of hazards". In relation to asbestos, opposition has arisen from property owners affected by proximity to soil

¹The term "contaminated land" as used in this paper is defined as "a site at which hazardous substances occur at concentrations above background concentrations and where assessment indicates it poses, or is likely to pose, an immediate or long-term risk to human health or the environment", (ANZECC, 1992). This definition has been widely adopted in New Zealand.

contaminated with this substance due to fears of health risks from exposure and loss in property values. However, the extent to which such attitudes are reflected in lower property prices affected by this contaminant is not well known in NZ.

Understanding the effects of asbestos soil contamination on property values and buyers' perceptions is important, not only to the local councils that administer environmental legislation, but also to affected landowners and valuers as it helps them determine the value adjustments to make to unaffected property prices, particularly where compensation claims are made against such property.

This paper outlines a case study approach used to examine the effects of asbestos soil contamination on residential property values. This follows the lines of similar research carried out by Priestley and Evans (1990) and the methodology developed by Priestley and Ignelzi (1989). Priestley and Ignelzi established a sound, standardised methodology for assessing environmental impacts in residential communities using postal surveys and hedonic modelling (regression analysis of sales transactions). However, there was insufficient sales transaction data in the case study area since 1997, when the contamination was discovered, to allow a hedonic pricing analysis that would produce statistically robust results. Hence, opinion surveys alone were used. The case study area selected for this research is Flat Bush, South Auckland, where asbestos dumping has occurred that received significant media attention.

This paper provides a brief review of the relevant literature and describes the nature of asbestos as a contaminant. The case study area selected for the research is then outlined. Next the methodology is described and the results from the study are presented. The paper concludes with a discussion of the results and suggestions for further research.

LITERATURE REVIEW

Valuing contaminated land

According to Sheard (1992), the approach commonly used in practice to value an interest in contaminated land is to deduct from the value of the interest post clean-up the cost to the owner of meeting any clean-up liability. Further, as some market prejudice or stigma² usually remains, a discount is usually required. The literature dealing with the valuation of contaminated property (see Chan (2002); Bond

² Stigma² is the blighting effect on property value caused by perceived risk and uncertainty. Uncertainties relate to negative intangible factors such as: the inability to effect a total "cure"; risk of failure of the remediation method; risk of changes in legislation or remediation standards; difficulty in obtaining finance, or simply, a fear of the unknown. Post-remediation "stigma" is the residual loss in value after all costs of remediation, including insurance and monitoring have been allowed for. It equates to the difference in value between a remediated contaminated site and a comparable "clean" site with no history of contamination.

(2001); Jayne (2000); Elliot-Jones (1995)) highlights the specific challenge of stigma estimation.

Researchers including Priestley & Evans (1990), Levesque (1994), Dotzour (1997), Simons, Bowen, & Sementelli (1997) and McCluskey & Rausser (2000) have used sales price analysis in the form of an econometric treatment to estimate the effect of risk perception and stigma on value, while others have used opinion surveys (see Kinnard et al. (1994), Syms (1997), McLean and Mundy (1998), Bond (2001)). The latter surveys have commonly been adopted to overcome the lack of sufficient sales transaction data with which to perform a sales price analysis.

Risk perceptions towards land contamination

Healy & Healy (1992) surveyed lenders' and investors' perceptions towards contamination in 1990. They interviewed twenty-five of the largest USA banks. The survey dealt with different types of contamination amongst other things. Lenders had greater concerns about groundwater contamination than unencapsulated asbestos, encapsulated asbestos and toxic inventories and underground tanks. They were least likely to loan on un-encapsulated asbestos and contiguous contamination and most likely to loan on previously contaminated properties. The most frequently selected adjustment to loans was to require additional indemnifications, followed by personal guarantees.

Bond et al. (1998) conducted a comparative study between the US and NZ in 1996 and 1997 of attitudes and policies of investors and lenders towards investing in property that is either alleged or known to have some form of contamination. It was found that in the US, attitudes towards contaminated property are changing towards a more tolerant stance on this issue compared to NZ investors, who are much more cautious. Reasons for this greater tolerance identified are the reviewed legislation reducing and limiting liability to lenders and other parties that may be involved with a specific piece of land.

US equity investors were more cautious to get involved with contaminated land than US lenders likely due to the fact that the legislation looks less kindly in terms of liability on equity investors as opposed to lenders. In NZ, the reverse was found: lenders were more cautious than equity investors when investing in contaminated land. The authors put this down to the lack of clear legislation in NZ.

According to Lusvardi (2000), the perception of risk of a contaminant is not always derived from the potential health hazards of the toxin, but from the possible litigation arising from having the substance found on the property. For example, in relation to asbestos, Lusvardi describes that asbestos is neither a toxin nor an allergen, yet it can form a plaque in the chest cavity if breathed for long periods that can cause death. It is for these health reasons that the US Environmental Protection Agency implemented a complete ban on asbestos in 1978 with nationwide removal

programs. Yet, according to Lusvardi, the reason many schools and businesses in the US are removing old asbestos is fear of litigation, not fear of health hazards from asbestos.

Estimating stigma associated with asbestos contamination

When estimating the value of asbestos contaminated land, it is important to determine just how the market participants behave toward property contamination. Their attitudes will be reflected in the prices they pay for affected property, and these prices form the main evidence used to value property.

For this reason, a study of buyer behaviour, in addition to sales price analysis, is warranted. This approach is supported by Mäler and Wyzga (1976), who observed that because the existing methods of analysis are often relatively crude, there might be the need to compare the results of more than one method. Researchers including Abelson (1979), Chalmers and Roehr (1993) and Kinnard et al. (1994) recommend the use of market sales analysis in tandem with opinion survey studies. Similarly, The Task Group on Statistical and Market Survey Techniques (Appraisal Institute, 2000) recommend the use of more than one approach for validating the analysis and the conclusions reached.

Since 1997, when asbestos contamination was discovered, there have been insufficient sales transactions in the case study area with which to perform a statistically robust sales price analysis. Hence, this paper focuses on the use of a survey-based approach to determine market perceptions towards living in proximity to asbestos contaminated land and how this impacts on property value. There have been no published studies carried out in NZ on asbestos contamination effects on property values. Further, no attitudinal studies which give a qualitative feel for effects of asbestos-contamination have been undertaken in NZ.

The next section outlines the nature of asbestos and the harmful health effects from exposure to it. Section 4 discusses the case study area where asbestos was found in the soil and how the local authority has addressed the issue.

ASBESTOS³

The nature of asbestos

The term “asbestos” best describes a group of naturally occurring substances which have similar qualities but are in fact different minerals. Asbestos rock fibres are very light, durable, flexible and heat resistant. It is virtually indestructible by fire, corrosion and other means. However, asbestos is readily broken into small slivers, or “fibrils”, allowing it to be mixed with other materials. These properties make it so versatile that there are over 3000 uses for the substance. Yet it is also these same

³ OSH Safeguard, 1991.

properties that make it toxic to humans. The very fact that asbestos breaks down into small particles makes it very easy to get into the respiratory system.

Asbestos fibres fall into two main categories:

- Chrysotile (white asbestos)
- Amphibole (blue and brown asbestos).

White asbestos was the mostly commonly used in NZ, while the more deadly brown and blue type asbestos were used less. Amphibole particles are silicates that means their fibres are straight, needle like structures that may split lengthwise to produce very fine fibrils, thus making it easier for the particles to enter the human respiratory system.

Harmful health effects from asbestos exposure

Buried asbestos is not dangerous, but if it is disturbed, fibres can be released into the air. The indestructible nature of the asbestos creates problems for the body to break down particles and get rid of them, making asbestos resistant to the bodies' defence mechanisms. There are three main diseases that a person can contract from exposure to asbestos particles, being:

- *Asbestosis* - a disease of the lungs which leads to breathing difficulties as the tissue of the lungs is destroyed. This in turn scars the lungs and restricts the movement of the lungs for breathing.
- *Lung cancer* - the asbestos fibres cause normal cell repair to get out of control and the cells continue to divide and build around the asbestos fibres developing into a lump which is called a tumour. Tumours can be either benign or malignant.
- *Mesothelioma* - a type of malignant tumour of the lining of the thoracic cavity (lining of the chest cavity). This is a rare type of cancer that is highly fatal. The cancer can occur usually many years after the exposure to asbestos has ceased (some 35-40 years later) after sufficient exposure has been allowed. The time between diagnosis and death is on average 8-9 months.

THE CASE STUDY AREA

A case study area was selected for this research that had asbestos contamination and residents living in the affected area. A control area not affected by asbestos contamination was also selected for purposes of comparison (refer to map in Appendix I).

The Flat Bush case study area

Flat Bush is in the Otara Ward⁴ of Manukau City (South Auckland). Urban development in Otara did not begin until the 1950s when a state housing project was initiated aimed at constructing 4,500 houses for 20,000 residents within a ten-year time frame. These houses were aimed primarily at the low-income market. This, together with a pro-immigration campaign, saw the area become populated with predominantly Maori and Pacific Island people. By 1967, Otara had grown sufficiently to justify the development of a town centre. Today Otara, and specifically Flat Bush, is a medium to low cost dormitory area including rental, state housing and private properties.

Flat Bush is situated approximately 30 kilometres south of Auckland's Central Business District, and approximately 3 kilometres north-east of Manukau City Centre. The contaminated land study area is bounded by Chapel, Murphies, and Redoubt Roads, Browns Lane, Ormiston Road and Gracechurch Drive (see Appendix I). The 925 hectares of land encompassed within this area is made up of a combination of low-density residential housing, rural lifestyle blocks, publicly owned land (including primary and secondary schools) and undeveloped land. The residential dwellings in the area consist of a broad range of housing stock from older rural homesteads to modern newly developed houses, reflecting the many subdivisions and developments that have been completed in the last 50 years.

Demographically, the Otara Ward has the youngest population of all the Auckland wards, with a medium age of 25 and with 42% of residents below 20 years of age. While nearly a third (31%) of the residents have no qualifications at all and 11% have only fifth form certificate as their highest qualification, over a third (36%) of the working age population is employed as professionals, managers or clerks. Nearly two-thirds (63%) of residents identify with the Pacific peoples ethnic group, 21 % Maori, 20% European and 9% Asian. Rental rates are the lowest in the City (Statistics New Zealand, 2001).

The history of asbestos dumping in the Flat Bush area

While asbestos contamination was not discovered until 1997, according to Perry (1999a), private contractors began delivering asbestos off-cuts from James Hardie's Penrose factory to many farms throughout South Auckland as far back as the 1930s. One driver evidenced many farmers using it as a multi-purpose landfill for gullies, the making of dams and for improving the drainage of boggy land, in addition to the making of driveways.

Asbestos piping was also crushed for use on farm roads, while some drivers were delivering up to fifteen bags of pure blue asbestos (the most toxic) to farmers every

⁴ Auckland City comprises seven Wards. Each Ward is governed by a community board and a number of city councilors who sit on the main city council.

month. In the late 1970's, James Hardie stopped production of asbestos products. However, by this time, many truck drivers had already delivered thousands of tonnes of asbestos throughout the Auckland area. The lethal effects of asbestos became known in 1975 (Perry, 1999a).

In November 1997, according to Perrott (2001), housing developers, while excavating, uncovered the toxic contaminant in the soil, initially found at the 25 Hilltop Road subdivision but centred around five heavily contaminated properties on Rakaia Rise (refer to map in Appendix I). Manukau City Council urged people to stay calm, but residents complained that they were not warned of the contamination when they brought their properties. As the resale value of their homes fell, they protested that their health and that of their children could be at long-term risk (Perrott, 2001).

Residents' actions groups were established to lobby local politicians and the national media. According to Perrott (2001), despite the debate, many are surprised that no one seems to have known the asbestos was there. Yet, back in 1963, Paul Cavanagh, QC, unsuccessfully sued the Manukau City Council for asbestos dumping that had been going on for decades.

Manukau East MP Ross Robertson presented a petition to Parliament in September 1998. An inquiry followed to investigate how the asbestos was dumped in the East Tamaki-Flat Bush area, establish the council's responsibilities and suggest remedies. In 2001, the Government issued a report from the local government and environment select committee. Amongst other things, the committee report recommends that the Manukau City Council undertake the following:

- offer help to Flat Bush property owners wanting their properties tested for asbestos contamination,
- help residents gain a clean bill of health on the land information memorandums (LIM reports) for their properties,
- remove the asbestos contaminating the Rakaia Rise properties as long as it can be done without releasing further fibres into the air,
- undertake the same sort of remedial work it would expect of any future developer, so landowners can have asbestos warnings removed from their LIM reports, and
- include restrictions or conditions to regulate and control any excavation on contaminated sites in the district plan.

The Manukau City Council's response

Initially, after the Manukau City Council (MCC) found the contamination of asbestos waste in 1997, it took the following action:

1. The council notified that applications for resource consents and building consents in the Flat Bush area will be required to include information on the presence, or

otherwise, of asbestos on the property concerned. Such notifications have been included on all Land Information Memoranda (LIM) issued under the Local Government Official Information and Public Meetings Act 1987, and all Project Information Memoranda issued under the Building Act 1991, (Special Manukau City Council Meeting 6/12/99).

2. The council commissioned a survey and action plan from an independent consultant with experience in the study of non-occupational contamination. The results of this study showed the following:

- that the environmental health risks of asbestos in the soil were extremely low;
- that low level dispersed asbestos fibre and chip contamination found in some areas of Flat Bush does not present an unacceptable health risk;
- the asbestos environmental health risk is much less than the risks deemed acceptable by most public health authorities, and much less than overall general exposure that everyone is faced with;
- that remediation of properties should only be required for sites where bulk asbestos contaminated material is present.

It was also found that the state that the chips of asbestos are encased in reflects a relatively low risk to residents. However, it was also noted there are no official guidelines outlining acceptable contaminant levels of asbestos in the soil. The management plan recommends that little action is needed for the sites considered low risk or containing little contamination.

The council decided to cover the asbestos after rejecting demands either to remove the material or buy out the residents. According to Perrott (2000) "Manukau City has offered to landscape the affected properties once the potentially deadly material is buried under at least 1 metre of soil". Yet the residents wanted the council to guarantee compensation if the buried asbestos and any lingering stigma caused the value of their properties to drop.

Subsequent to the 2001 report from the local government and environment select committee outlined above, the MCC negotiated the removal of the asbestos affecting Rakaia Rise properties. Further, it developed guidelines for dealing with contaminated sites and any development of them.

Issues for residents

Two main issues requiring resolution of the contaminated land issue as identified by the Manukau Asbestos Action Group (MAAG) and the public are outlined, as follows:

Tagging of land information memorandums

All properties within the 925-hectare study area automatically have a tag on their Land Information Memorandum, indicating that the site may or may not be

contaminated with asbestos, even sites which have been shown to have clear soil samples. Residents believe there has been a noticeable drop in values since this issue has arisen, but with no reflective drop in rating valuation. According to Perry (1999b), fifteen Flat Bush owners, who were considering suing the MCC, say they have lost tens of thousands of dollars from their property values as a result of being within a council-identified asbestos zone.

Health issues

Many residents are wary of any dust getting pushed up from the soil due to any land developments (e.g. foundation excavations) that may occur, and thereby turning the asbestos into a form that has a toxic affect.

A scoping report commissioned by the MAAG (Flat Bush Asbestos Contamination, July 1999) indicates that the effects of low-dose scenarios in reference to Chrysotile are poorly understood; thus there are no real precedents to work from in assessing the risk to property owners health in reference to the asbestos contamination. Secondly, as outlined earlier, the MCC has no official guidelines to effectively compare with that indicate safe levels of asbestos.

According to Flat Bush residents, people now know Flat Bush as a place riddled with asbestos and that the hard part would be changing people's perception of the suburb. "Asbestos is an unknown item. They don't know the health risks and for many, it is a fear of the unknown" (Kara, 1999).

A final solution

According to Thomas (2003), in January 2003, six Flat Bush residents abandoned their homes for 8 to 10 weeks to let contractors remove asbestos. Five-hundred truckloads of bulk asbestos and soil were excavated and carted to an approved landfill. The work, including restoring grounds with clean soil, cost Manukau City ratepayers \$800,000.

About 1600 cubic metres of material was removed from the old dump. However, a major disappointment for residents was that although all asbestos material was supposed to be removed, the property's Land Information Memorandum (LIM) would not be amended to state that it was asbestos-free. For council, their major disappointment was that the Government refused to consider a council request for \$1 million compensation for its pioneer work.

RESEARCH METHODOLOGY

By investigating market perceptions of risk towards asbestos contaminated land, more informed adjustments to property values can be made. A self-administered survey of residents was used to determine the perceptions of residential property owners towards living on, or in close proximity to, asbestos-contaminated land and to determine how they evaluate these effects. This attitudinal study serves to

demonstrate perceptions of the effect of asbestos contaminated land upon residential property values in Auckland, NZ, in 2002.

The questionnaire development included the following steps: a review of the related literature together with interviews with key informants and area residents to identify the focus the study should take. This information provided input for the development of the preliminary questionnaire that was tested on a small sample of respondents. A final questionnaire was developed.

Research areas: case study and control

In addition to surveying residents in the case study area of Flat Bush, a survey of the general public in a control area unaffected by asbestos contamination, but within close proximity of Flat Bush (within 2 km), was selected for comparison. The control area selected was the Hunters Plaza, Papatoetoe. This area was chosen in order to achieve a high response rate for conducting the interview surveys (high pedestrian flows). Further, Papatoetoe has similar population demographics to that in the case study area, comprising middle to lower income earners, although it is a more established suburb than the study area.

Papatoetoe was first declared a District in 1865 and developed rapidly in the early 1900s. The area experienced another burst of growth after World War Two with the initiation of the Rehabilitation Scheme where money was loaned to returning servicemen for the building of houses. By the 1980s, the area was almost fully developed; however, infill housing in more recent years has seen a slight rise in population. In 1990, Papatoetoe became a Ward within Manukau City, South Auckland. Papatoetoe is a medium to low cost dormitory area including rental, state housing, and private properties.

Demographically, the Papatoetoe Ward population comprises a larger European ethnic group than the Otara Ward (48% versus 20% in the Otara Ward) and is older, with a medium age of 34 years (25 years in Otara). Other ethnic groups represented in the Ward are Pacific peoples (26%), Asian (20%), and Maori (18%). The educational background of residents is similar to those in Otara, with 25% having no qualifications and 13% having fifth-form certificate as their highest qualification. Just under half (47%) of the working age population are employed as professionals, managers or clerks (compared to 36% in the Otara Ward) and 19% are employed in the manufacturing industry. Mean and median household incomes are the lowest in the City, \$46,301 and \$38,769 respectively, compared to \$49,529 and \$43,248 in Otara (2001 Census figures).

At the time the asbestos was discovered in 1997, the NZ property market was flourishing. But in 1998, the NZ economy slumped due in part to the Asian financial crisis, the rise in unemployment and the removal of import protection. The

property market was similarly affected. In Manukau, NZ's fastest growing city, construction activity slowed 18% from its high in 1997.

Real estate statistics from the Real Estate Institute of NZ (REINZ) indicate that for the Papatoetoe area⁵, the average house sales price increased from 1998 to 2000, but more slowly than in the previous year. Prices rose 3.6% from \$176,000 to \$182,500. In 2000, the average sale price fell by 4.5% to \$174,000, recovering slightly in 2001 to \$176,000. During the same period, the national average house sales price increased every year from \$164,000 in 1998 to \$175,000 in 2001-2002. Currently, in 2004, the average house sales price in Papatoetoe is \$290,000 (\$240,000 nationally), indicating the strong market conditions experienced over the last two years.

Survey method

Two surveys were conducted in 2002: a survey of residents in the case study area and a survey of the general public in the control area. The surveys were conducted through personal interviews. The resident survey involved going door-to-door, asking if the respondent would be willing to be surveyed in a short interview. These interviews were completed between 4:30pm and 7:30p.m. over two nights. The control group survey involved asking the general public that were passing through the shopping mall if they would be willing to be surveyed. These survey interviews were conducted in the afternoon over two days.

The interview questions were grouped into two sections:

- *Section 1:* A set of questions were asked about the respondents' perceptions of asbestos, the contamination in Flat Bush and its affect on residential property values.
- *Section 2:* A set of general demographic questions was asked. An identifier question was included in the control group survey to determine the location in which respondents live to avoid including Flat Bush residents in this respondent group.

The control group and residents' surveys differed slightly to adjust for the differing respondent situations (i.e. living in the affected versus the unaffected areas).

Sample size

Due to the choice of a time-consuming survey method (personal interviews) and constraints of both time and money, a sample of only 30 was chosen for each of the control and the resident surveys. However, the choice of the personal interview surveying method did mean that a 100% response rate was achieved.

⁵ Includes Papatoetoe, Otara, Manukau Centre, Mangere and Mangere Bridge, and East Tamaki.

RESEARCH FINDINGS

Opinions about Flat Bush as a place to live

When asked to rate Flat Bush as a place to live as compared to other Manukau suburbs, half of the respondents (50%) in the case study area rated Flat Bush as more desirable, 22% rated it as comparable and 28% rated it as a less desirable place to live. The control group respondents that knew where Flat Bush was located, (83%), were more negative towards Flat Bush as a place to live. Only 13% of these respondents rated Flat Bush as more desirable, 25% rated it as comparable and nearly two-thirds (62%) rated it as a less desirable place to live compared to other Manukau suburbs. When asked to specify the reasons for this rating, those respondents living in Flat Bush said they preferred it because they saw it as a nice and quiet neighbourhood, with better homes. One person, who did not rate Flat Bush highly, highlighted the issue of contamination as a reason for their response.

From these responses, it appears that even with the contamination issues plaguing the area, the majority still think it is at least comparable, if not more desirable, than other neighbourhoods in the Manukau area. This would indicate that the asbestos contamination does not affect their opinions about Flat Bush as a place to live and that they still prefer it to the lower socio-economic surrounding areas. It is possible that they were not actually aware of the asbestos contamination as some responses to the next question indicate (see below).

Another explanation of why more of the Flat Bush residents prefer Flat Bush as a place to live than the control group respondents is likely due to bias as they have a vested interest in property there. Few investors would openly admit that they made a poor investment decision, even if they did believe they had (a phenomenon known in the marketing literature as “buyer dissonance”). As the control group respondents do not have any financial interest in property in the Flat Bush location, they have less bias towards those properties and their responses are likely to be more candid. However, whilst these respondents have rated Flat Bush more negatively than the residents, it is unclear the reasons for this rating.

Awareness of contamination

A surprisingly large percentage (42%) of the residents were not aware of any contamination in the Flat Bush area, with 58% being aware of it. All of the respondents that were aware of any contamination identified asbestos as the contaminant.

When asked how aware the respondents were of the specific asbestos contamination at Flat Bush, nearly two-thirds (65%) of the residents were aware of it. Over a third (35%) of the respondents had no knowledge of any asbestos contamination details. Similar results were reported for the control group, with 68% of the respondents

being aware of the Flat Bush asbestos contamination, and just under a third (32%) had no knowledge of the specific contamination.

Given that nearly a third of the residents were not aware of any asbestos contamination at Flat Bush, they presumably purchased their properties within the area not knowing of the potential issues that confront their properties, as outlined by the Manukau Asbestos Action Group. Those that are aware of the asbestos contamination may have purchased their property before this became known or may have underestimated its effects.

A question was asked about the source of information where they learned of the asbestos contamination. The resident respondents report the main source of this information as the local newspaper (40%), with the television (21%) and friends (19%) as the other major information sources. The control group's main sources of information were the local paper (46%), television (27%) and large circulation newspaper (16%).

The results suggest that there is a degree of uncertainty and lack of awareness about the asbestos contamination. This uncertainty is also reflected in the views of the Manukau Asbestos Action Group that indicate a lack of trust that the Manukau City Council will deal with the issues in a positive way and that the risks associated with the contamination are perceived to be high, even after discussions of a resolution. This situation is consistent with Mundy's (1992) observation that the initial period when a contamination becomes known and when there is a lack of detailed knowledge about it leads to heightened uncertainty and higher risks, and property value discounts are greater.

Asbestos's affects on the body

Respondents were asked how aware they are of the affects that asbestos has on the human body. Over half of the residents (56%) were aware of the affects of asbestos on the body, 22% were very aware of the affects and 22% did not have any idea of the affects of asbestos. More control group respondents were aware of the affects that asbestos has on the human body than the resident group. Nearly three-quarters (74%) of the control group were aware of these, and an additional 16% were very aware. Only 10% had no knowledge of the affects that asbestos has on the body. Both groups associated asbestos mainly with lung cancer and or/lung problems.

These results conform to the previously reported findings that the residents have less idea of the risks involved with the contamination than do their control group counterparts. This is another reason that the residents may be more willing to live in Flat Bush than persons who are better informed of the health and associated risks from asbestos. It is also possible that as the residents surveyed are not being personally affected by the asbestos contamination, they may not perceive it as a risk or a concern.

Feelings towards moving to Flat Bush after news of the asbestos contamination has become known

When asked if the respondents would move to the Flat Bush area knowing about the contamination, 56% of the residents said that they would not have moved to the area, 25% responded that they would move and 19% were unsure. In contrast, 90% of the control group said they would not move to the area, with only 6% being willing to. This result indicates that from the general public’s viewpoint, the issue of contamination is a very strong deterrent from purchasing a property in the area.

Again, these results conform to the previously reported findings that the residents have less idea of the risks involved with the contamination than do their control group counterparts and/or appear to be less concerned about them.

Recipient’s perceptions of value affects due to asbestos contamination

This question had two components: the respondent’s perceptions of property value affects from the asbestos contamination on property in (1) the contaminated area, and (2) in the surrounding uncontaminated area. Tables 1 and 2 summarise these results.

Table 1: Affect on value of properties in the contaminated area

Percentage of Value	Resident Group	Control Group
+ 0 to +10%	13%	0%
0%	16%	3%
- 0 to -5%	13%	7%
- 6 to -10%	29%	13%
- 11 to -15%	23%	47%
> -15%	0%	30%

In the affected area, nearly a third (29%) of the residents indicate that the contaminated land issue would reduce property values by between 6% and 10%, 23% of the respondents indicate a drop in value of between 11% and 15%, and 16% said it would have no affect. Surprisingly, 13% thought it would increase value between 0-10%. It is possible that they misread the question and confused the plus and minus signs in the responses provided.

As for responses to previous questions, the results indicate a more negative response towards the asbestos contamination from the control group compared to the resident group. Nearly a half (47%) of the respondents in the control group responded that the value of the property in the affected area would be reduced by between 11% and 15% due to the asbestos contamination, while a large number of respondents (30%) also indicated an even greater loss in value of more than 15%.

As was expected, none of respondents thought the asbestos contamination would increase values.

It was noted during discussions with the residents that they believed their property values had been recovering in the last couple of years from an initial substantial decrease “after the issue had settled down”.⁶ This reduction in the affect of the asbestos stigma on property values over time has been found to occur in other similar studies of contaminated land. For example, in a study by Closser (2001) of fuel-oil contamination of a residence, it was found that the affect of stigma on property values that occurred as a result of the contamination reduced from 28% to 6% in two years and furthermore as time went on.

When asked about the affect of the asbestos contamination on the value of properties in the nearby surrounding unaffected areas, responses from both respondent groups were quite similar. In the resident survey, 40% of the respondents believed that the values of the properties in the unaffected area would be reduced by between 0% and 5% due to proximity to an area contaminated with asbestos and 23% believed that there would be no decrease in value. The corresponding responses from the control group were 37% and 20%. However, 27% of the control group believed there would be a decrease in value between 6% and 10%.

Table 2: Affect on value of properties in the unaffected area

Percentage of Value	Resident Group	Control Group
+ 0 to +5%	7%	6.5%
0%	23%	20%
- 0 to -5%	40%	37%
- 6 to -10%	13.5%	27%
- 11 to -15%	13.5%	6.5%
> -15%	3%	3%

From these results, it appears that both respondent groups perceive that the contamination issue affects not only the contaminated area, but also the nearby surrounding uncontaminated area. This indicates the existence of stigma where the surrounding land, although not contaminated, may suffer a reduction of value simply due to its proximity to the affected contaminated area due to unknown associated risks. This may be a result of distrust towards claims made by the local government. For example, the Manukau City Council have declared the site safe, but have not removed the warnings on the LIMs. Further, as there is no real

⁶ The property market in Papatoetoe rose slowly in 1998 and 1999, but decreased significantly in 2000, recovering only slightly in 2001.

measure to show how clean a site is before it is truly safe, people may also doubt how accurate the measurements of contamination are.

Remediation, resolutions and stigma

The final question addressed the actual issue of stigma. A hypothetical situation is outlined in which full remediation of the contaminated land has been completed. Respondents were asked whether they believe the values of the properties in the affected area would still be affected. For both respondent groups (residents: 61% and control: 67%), it was indicated that the areas values would be “somewhat affected” (the average sales price at the time was around \$176,000). However, no logical reasons were given for these beliefs. As previously mentioned and outlined in Patchin (1991), there is a certain degree of uncertainty as to how well clean up has been undertaken, especially where there is no guidelines to determine what is safe. Responses to this question indicate that there is a continuing stigma associated with contaminated land even after it has been totally remedied.

SECTION 2

General information

The resident survey found that nearly half (48%) of the residents had lived in the area for between one to four years, with a third having lived there less than a year. Over three-quarters (78%) of the residents owned their own homes. Households were made up predominantly of multi-person households of either 2-3 people (41%) or 4 –5 people (47%). The occupations of the residents varied greatly from professionals (23%), householders (13%), trades-people (13%) to students (3%). The ages of the recipients were predominately 30-39 years of age (44%), with 22% being between 22-29 years and a further 22% being between 40-49 years. The ethnic composition of the residents was mixed, being mainly NZ European (31%), Maori (25%) and Indian (16%).

While the control survey was conducted in Papatoetoe, 73% of the respondents came from Papatoetoe, Otara and Otahuhu, 10% came from Papakura, 7% came from Panmure, and the remainder were from Mangere, South East Auckland or other areas. Compared to the resident survey, the control group respondents comprised predominantly NZ European (63%) and were much older retirees (43% over 60 years of age). This older respondent group may be a result of the time of day the survey was conducted and the greater approachability of this group compared to younger persons. However, other groups represented in the sample included those working as trade persons (17%), educators (10%) and medical workers (10%), aged between 30 to 39 (23%) and 40 to 49 (30%).

As most of the residents had lived in the area for less than five years, they moved into the area after the issue was initially exposed in 1997. This suggests that these people were either undeterred by the asbestos contamination, had they known about it, or believe the risks to be minimal. Alternatively, they may not have known about

the contamination when they moved there. This finding was confirmed by the results found earlier in the survey.

RESEARCH LIMITATIONS

The main limitation of the survey was the time and money constraints in conducting the survey and the potential sampling bias, as outlined below:

Time and money restrictions

This research project had a strict time limitation to adhere to, thus a full random survey was not possible⁷. Further, no funding was allocated to the study which limited the choice of surveying techniques. Had a more extensive survey been possible, the results may have been quite different. Thus, caution must be used in making generalisations from the study or applying the results directly to other similar studies.

Non-sampling errors

Non-sampling errors were unavoidable due to the constraints on sampling and surveying outlined above. The resident survey involved going door-to-door between 4.30 pm and 7.30pm, asking if the respondent would be willing to part-take in a short interview. The control group survey involved approaching people in a day-time shopping situation asking for their willingness to participate. Hence, the sampling in each case included the following biases:

- Not at home/non-response bias: replies could not be secured due to the candidates not being at home or being too busy.
- Self-selection bias: the recipients may choose to answer the survey because they feel strongly in their opinion towards the issue, thus only extreme points of view may have been obtained. In many cases in the control group, younger people would not answer the survey because they were too busy. However, the retirees surveyed were generally very receptive. The large group of NZ European retirees who were willing to be surveyed will skew the result of the control group, as outlined in the methodology. Secondly, due to time restrictions of the study, the selection of the streets and houses where the respondents were to be surveyed was arbitrary and based more on convenience than a statistically robust random sample.
- Behavioural considerations: people may answer questions in a way they consider socially desirable.

SUMMARY AND CONCLUSIONS

The aim of this study was to investigate the attitudes and reactions of residents in a case study neighbourhood towards living on or near asbestos-contaminated land and

⁷ Research assistance was only available for one University semester.

how this might impact on property values. The case study neighbourhood selected for this study was Flat Bush, South Auckland, NZ, as asbestos contamination was discovered there in 1997 that received significant media attention.

The survey results indicate that a large proportion of residents in the subject area had little knowledge of many of the factors plaguing the area. This was a surprise, given that other residents are very aware and concerned about the issue (for example, members of the Manukau Asbestos Action Group). The results may have been quite different had the respondents been fully aware of the asbestos contamination and the associated potential risks.

Most of the control group respondents had heard of the asbestos issue. Nearly a half (47%) of the control group respondents considered that the value of the property in the affected area would be reduced by between 11% and 15% due to the asbestos contamination (compared to 23% of the case study respondents). Nearly a third (30%) of the control group respondents also indicated an even greater loss in value of more than 15%. None of the case study respondents considered the loss to be that great.

Although the majority of the sites in the affected area are considered by experts to be of low or no health risk, the issue of contamination has not been totally resolved, as indicated by the presence of caveats on all of the LIMs of properties in the affected area. This would appear to indicate a continued lack of confidence by the local government over the guaranteed safety of the area. Similarly, the results from the case study indicate that while the actual risk is considered low by official standards, the market perceives the risks to be much higher and hence the associated property value loss to be greater (this response was more apparent in the control group survey than the resident survey). These findings may indicate that even if the LIMs are lifted, there will still be evidence of stigma in the area generally in the form of reduced values.

As no guidelines exist as to the level of asbestos contamination in the soil that is safe for habitation, uncertainty remains and people's perceptions are consequently adversely affected to the point that once the site has been remediated, a stigma may remain.

It must be kept in mind that these results are the product of a single, albeit limited, case study carried out in a specific neighbourhood (Flat Bush, Auckland) at a specific point in time (2002) and that caution must be used in making generalisations from the study or applying the results directly to other similar situations. The value-effects from asbestos contamination may vary over time as market perceptions change due to increased public awareness regarding the potential adverse health effects of living near land contaminated with asbestos and

with reassurances from local government that the issue will be dealt with in an environmentally satisfactory manner.

While the research served to indicate the degree to which residents' perceptions towards living near asbestos contaminated land may be reflected in lower prices, to provide more defensible results, it would have been useful to compare these results with a statistical analysis of the sales transaction data had this been possible. Such a comparison would show whether the negative perceptions are indeed reflected in lower property sales prices. However, the results could be improved by investigating other cultural, demographic and geographic settings and by studying these impacts over time.

Results from the current study, together with those from the further research suggested, will be useful to property owners, property valuers and local authorities in determining the perceived level of risk associated with asbestos and other contaminants from geographically and socio-economically diverse areas to aid in the valuation of property affected by these. Similarly, knowledge of the extent these risks are incorporated into property prices and how they vary over time will lead to more accurate value assessments of properties in close proximity to affected land and help in resolving compensation issues in a quantitative way.

Acknowledgements

We would like to offer special thanks to Penelope Quinn of the Manukau Asbestos Action Group, and the Manukau City Council for the use of their resources and time.

REFERENCES

Abelson, P. W. (1979). Property prices and amenity values. *Journal of Environmental Economics and Management*, Vol. 6, pp. 11-28.

ANZECC (1992). *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*. Australian and New Zealand Environment and Conservation Council, National Health and Medical Research Council (1992).

Appraisal Institute (2000), *Proposed USPAP Statement on Appraisal Standards- First Exposure Draft: Utilization of Statistical and Market Survey Techniques in Real Estate Research, Appraising, Counselling and Consulting Assignments* (Exposure Draft). Appraisal Institute: Task Group for the development of standards for determining the acceptability of applications of statistical and market survey techniques to the valuation of real property, Chicago.

Bond, S.G. (2001). Stigma assessment: the case of a remediated contaminated site. *Journal of Property Investment and Finance*, Vol. 19, No. 2, pp. 188-210.

- Bond, S. G., Kinnard, W., Kennedy, P. J. and Worzala, E. M. (2001). An international perspective of incorporating risk in the valuation of contaminated land. *The Appraisal Journal*, July, pp. 258-265.
- Bond, S. G., Kinnard, W. N., Worzala, E. M. and Kapplin, S. D. (1997). Lenders' and investors' attitudes and policies toward property contamination: New Zealand and America compared. *Australian Land Economics Review*, Vol. 3, No. 2, pp. 11-18.
- Bond, S. G., Kinnard, W. N., Worzala, E. M. and Kapplin, S. D. (1998). Market participants' reactions toward contaminated property in New Zealand and the USA. *Journal of Property Valuation and Investment*, Vol. 16, No. 3, pp. 251-272.
- Chalmers, J. A. and Roehr, S. A. (1993). Issues in the valuation of contaminated property. *The Appraisal Journal*, Jan, pp. 28-41.
- Chan, N. (2002). Stigma assessment: a multi-criteria decision-making approach. *Pacific Rim Property Research Journal*, Vol. 8, No. 1, pp. 29-47.
- Closser, B. M. (2001). Fuel-oil contamination of a residence: a case study in stigma. *The Appraisal Journal*, July, pp. 307-311.
- Dale, L., Murdoch, J. C., Thayer, M. A. and Waddell, P. A. (1999). Do property values rebound from environmental stigmas? Evidence from Dallas. *Land Economics*, Vol. 75, No. 2, pp. 311-326.
- Dotzour, M. (1997). Groundwater contamination and residential property values. *The Appraisal Journal*, Vol. 65, No. 3, pp. 279-284.
- Elliot-Jones, M. (1995). Valuation of post-cleanup property: the economic basis of stigma damages. *Bureau of National Affairs Toxics Law Reporter*, February 1, pp. 944-955.
- Harsveld, S. (1994). *Contaminated Land*. For BProp Research Project, unpublished (held in the Architecture Library on desk copy).
- Healy, P. R. & Healy, J. J. (1992). Lenders' and investors' perspectives on environmental issues. *The Appraisal Journal*, Vol. 60, No. 3, pp. 394-398.
- Jackson, T. O. (2001). Environmental risk perceptions of commercial and industrial real estate lenders. *Journal of Real Estate Research*, Vol. 22, No. 3, pp. 271-288.

Jayne, M. R. (2000). An analysis and comparison of public perceptions of the risks of certain land based activities to aid sustainable development. RICS Cutting Edge Conference, London, UK, September 6-8.

Kara, S (1999). Asbestos risk “low” but fears continue. *The New Zealand Herald*, 7/12/1999.

Kinnard, W. N., Geckler, M. B. and Dickey, S. A. (1994). Fear (as a measure of damages) strikes out: two case studies comparisons of actual market behaviour with opinion survey research. Paper presented at *The Tenth Annual American Real Estate Society Conference*, April, Santa Barbara, California.

Kinnard, W. N., Worzala, E. W., Bond, S. G. and Kennedy, P. J. (1999). Comparative studies of United States, United Kingdom and New Zealand appraisal practice: valuing contaminated property. Paper presented at *The Fifteenth American Real Estate Society Conference*, April 7-10, Tampa, Florida.

Levesque, T. J. (1994). Modelling the effects of airport noise on residential housing markets. *Journal of Transport Economics and Policy*, Vol. 28, May, pp. 199-210.

Lusvardi W. C. (2000). The dose makes the poison: environmental phobia or regulatory stigma? *The Appraisal Journal*, April, pp. 184-194.

Mäler, K. G. and Wyzga, R. E. (1976). Economic measurement of environmental damage: a technical handbook. *Organization for Economic Co-operation and Development*, Paris, France.

Manukau City Council (06/12/1999). *Agenda for Special Meeting of the Manukau City Council*, Manukau Civic Centre, Wiri Station Rd, Manukau.

McCluskey, J. J. and Rausser, G. C. (2000). *Stigmatized Asset Values: Is it Temporary or Permanent?*, Research paper, Department of Agricultural Economics, Washington State University, WA.

McLean, D. G. and Mundy, B. (1998). The addition of contingent valuation and conjoint analysis to the required body of knowledge for the estimation of environmental damages to real property. *Journal of Real Estate Practice and Education*, Vol. 1, No. 1, pp. 1-19.

Mitchell Partnerships Environmental Consultants (NZ) Ltd (1999). *Flat Bush Asbestos Contamination Scoping Report*, Level 1, 25 ANZAC St, Takapuna, Auckland.

- Occupational Health and Safety (OHS) (1991). Why asbestos kills. *Safeguard - The Journal of Occupational Safety and Health*, Dec, pp. 12- 13.
- Patchin, P, J. (1988a). Valuation of contaminated properties. *The Appraisal Journal*, Vol. 56, No. 1, pp. 7- 16.
- Patchin, P. J. (1988b). Contaminated properties - stigma revisited. *The Appraisal Journal*, April, pp. 167-172.
- Perrott, A. (2000). Asbestos compo demanded. *The New Zealand Herald*, 15/12/2000.
- Perrott, A. (2001). Asbestos: the killer in the soil. *The New Zealand Herald*, 20/06/2001.
- Perry, N. (1999a). Killer waste delivered by the truckload. *The New Zealand Herald*, 10/04/1999.
- Perry, N. (1999b). Anger boils over in asbestos country. *The New Zealand Herald*, 10/04/1999.
- Priestley, T. and Evans, G. (1990). *Perception of a Transmission Line in a Residential Neighbourhood: Results of a Case Study in Vallejo, California*. A report prepared for Southern California Edison Environmental Affairs Division, San Francisco.
- Priestley, T. and Ignelzi, P. (1989). *A Methodology for Assessing Transmission Line Impacts in Residential Communities*. A report prepared for Edison Electric Institute: Siting and Environmental Planning Task Force, San Francisco.
- Sheard, E.M. (1992). Valuation of contaminated land: current theory and practice. *Journal of Property Valuation and Investment*, Vol. 11, pp. 17- 27.
- Simons, R. A., Bowen, W. and Sementelli, A. (1997). The effect of underground storage tanks on residential property values in Cuyahoga County, Ohio. *Journal of Real Estate Research*, Vol. 14, No. 1, pp. 29-41.
- Statistics New Zealand (2001). *Census of population and dwellings*. Retrieved October 3, 2003, from <http://www.stats.govt.nz/census.htm>.
- Syms, P. (1997). *Contaminated Land: The Practice and Economics of Redevelopment*, Blackwell Science, Oxford.

Szmigielski, S. and Szmigielski, E (2000). Cellular phone systems and human health - problems with risk perception and communication. *Environmental Management and Health*, Vol. 11, No. 4, pp. 352-368.

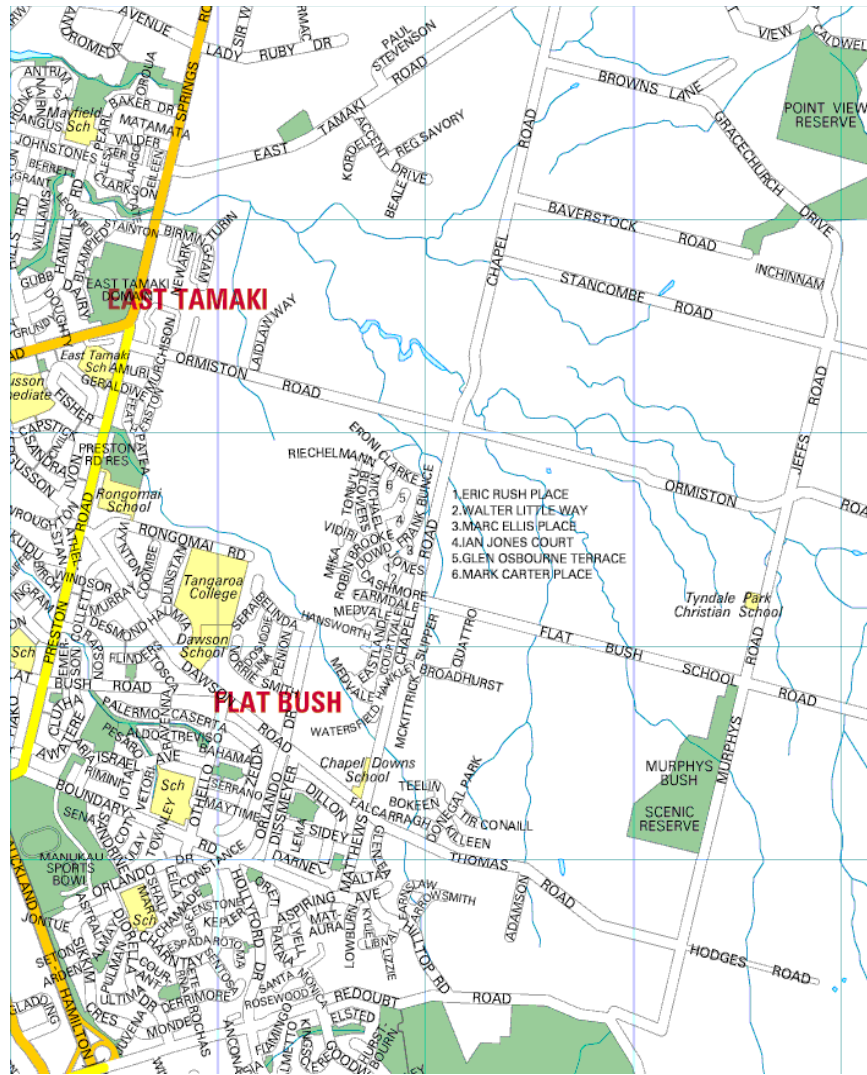
Thomson, W. (2003). Relief as asbestos dump removal work begins. *The NZ Herald*, 14/01/2003.

Weber, B. R. and Syms, P. M. (2002). A beginning best practice Brownfield valuation model. *The Appraisal Journal*, Vol. 70, No. 1, pp. 60-75.

Wilson, A. R. and Alarcon, A. R. (1997). Lender attitudes towards source and non-source impaired property mortgages. *The Appraisal Journal*, Vol. 65, No. 4, pp. 396-400.

APPENDIX

Flat Bush



Auckland City

