A Political Ecology of Household Waste Management in Cleveland:

The Role of Energy from Waste

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Ph.D. Thesis

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Thesis Summary

Increasing quantities of household waste, and its rise as a social and environmental problem, has lead to waste becoming increasingly politicised in Britain. This politicisation is reflected in a raft of legislation emphasising targets and obligations for waste management. Energy from waste is being promoted as a means of meeting targets which aim to reduce the amount of waste being landfilled. A modern energy from waste plant has recently opened in Cleveland, in the Northeast of England, which is the case study area for this thesis.

This thesis argues that the householder has a significant role in the management of domestic waste, and their perspectives, behaviour, and attitudes towards waste have important influences on waste strategies. The theoretical approach of political ecology is adopted to examine these relationships, since it seeks explanation for environmental problems from a range of nested scales of analyses. As a key element of this approach the thesis introduces the innovative technique of Q Methodology to the field. Q Methodology is an emerging variation on ethnographic techniques, but takes the process of analysis further by involving the participants in the assessment of their own discourses.

This analysis reveals that there are a number of complex and varied relationships between householders, waste and the environment in Cleveland. These interrelations are manifest at many different levels and help to explain how all parties involved in waste management, from the householder to international waste management businesses, are implicated in the legitimisation of waste. While all waste recovery techniques legitimise waste, energy from waste is the best means of legitimisation because it transforms waste into a clean and easily convertible currency (electricity) which can be used in further production.
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<th>Description</th>
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<tbody>
<tr>
<td>BATNEEC</td>
<td>Best Available Technology Not Exceeding Excessive Costs</td>
</tr>
<tr>
<td>BPEO</td>
<td>Best Practicable Environmental Option</td>
</tr>
<tr>
<td>CCC</td>
<td>Cleveland County Council</td>
</tr>
<tr>
<td>CWM</td>
<td>Cleveland Waste Management Ltd.</td>
</tr>
<tr>
<td>CWT</td>
<td>Cleveland Waste Triangle</td>
</tr>
<tr>
<td>DETR</td>
<td>Department of the Environment Transport and Regions</td>
</tr>
<tr>
<td>DoE</td>
<td>Department of the Environment (preceded DETR)</td>
</tr>
<tr>
<td>DTI</td>
<td>Department of Trade and Industry</td>
</tr>
<tr>
<td>EA</td>
<td>Environment Agency</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>EfW</td>
<td>Energy from Waste</td>
</tr>
<tr>
<td>INCPEN</td>
<td>Industry Council for Packaging and the Environment</td>
</tr>
<tr>
<td>IWM</td>
<td>Integrated Waste Management</td>
</tr>
<tr>
<td>LCA</td>
<td>Life Cycle Analysis</td>
</tr>
<tr>
<td>MRF</td>
<td>Materials Reclamation Facility</td>
</tr>
<tr>
<td>MSW</td>
<td>Municipal Solid Waste</td>
</tr>
<tr>
<td>NEM</td>
<td>Northumbrian Environmental Management Ltd.</td>
</tr>
<tr>
<td>NFFO</td>
<td>Non Fossil Fuel Obligation</td>
</tr>
<tr>
<td>NIMBY</td>
<td>Not In My Back Yard</td>
</tr>
<tr>
<td>NIMCBY</td>
<td>Not In My Children’s Back Yard</td>
</tr>
<tr>
<td>PP</td>
<td>Proximity Principle</td>
</tr>
<tr>
<td>PPP</td>
<td>Polluter Pays Principle</td>
</tr>
<tr>
<td>PRN</td>
<td>Packaging Waste Recovery Note</td>
</tr>
<tr>
<td>SEPA</td>
<td>Scottish Environmental Protection Agency</td>
</tr>
<tr>
<td>TDC</td>
<td>Teesside Development Commission</td>
</tr>
<tr>
<td>tpa</td>
<td>tonnes per annum</td>
</tr>
<tr>
<td>WMC</td>
<td>Waste Management Company</td>
</tr>
<tr>
<td>RGC</td>
<td>Renewable Generators’ Consortium</td>
</tr>
<tr>
<td>REC</td>
<td>Regional Electricity Company</td>
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1. Introduction

1.1 The problem of household waste

The problem of household waste has become an issue of increasing concern for environmental groups, politicians, industrialists, and the general public. As environmental issues continue to climb the social and political agenda, issues of waste management have followed suit. In many ways, household waste has become a tangible and symbolic focus for the concerns over the current ecological crises faced in the modern world, as it is both a visible sign of the profligacy of modern western society and a problem in which we all play a role.

These concerns coincide with very real crises in the waste management industry, where steadily rising quantities of domestic waste are being met by the decreasing ability of the waste industry to cope with these pressures. Hard choices on the future of waste management are being made met with competing demands and expectations, which are shaping current and future strategies, against a dynamic social and economic backdrop. This thesis will attempt to unravel these complex issues and relationships using a case study in Cleveland, north-east England in order to understand the wider problems of waste which the developed world faces now and in the future.

1.2 Research objectives

The objective of this study is to analyse local perspectives on the origins of and options for the disposal of domestic waste, with particular emphasis being given to EfW. In pursuing this objective the analysis takes into account the perspectives of local campaigners, politicians, planners, and waste managers, but the central focus of this research is on the household and its occupants. There are over 23 million households in Britain (OPCS, 1993), each home functions, to varying degrees, as miniature waste management units. Individuals within these this units will influence the ways in which we manage domestic waste, and equally, each home and its occupants will be affected by particular waste management strategies.
Even at its most basic level, waste management requires the input of labour from each waste producing domestic unit. For example, householders have to place waste outside their homes once or twice a week. This means that of all waste produced, domestic waste affords special status because it necessitates local management by millions of individuals who are involved in daily management practices.

While a large volume of work has been undertaken on the recycling of domestic refuse, and the domestic labour required to participate in recycling, comparatively little is known about the public’s understanding of EfW, their input into this means of recovery, and the impact the householder may have on the development of EfW in Britain. Yet within the chosen area of study, EfW has become a dominant waste management option, and the exploratory research presented in this thesis will help to assess the public’s knowledge of, and involvement in EfW, while also elucidating some issues which might influence energy from waste’s future in Britain. In approaching this wide subject, three general themes will be explored:

- What are the outlooks, perspectives and expectations of the central players in any waste management strategy: the individual householders. Without a better understanding of their perceptions, motivations, and involvement, then solutions to the waste problems will be difficult to find.

- What are the reasons behind the various waste management decisions that have been taken in Cleveland and what has been the general reception of these ideas? In particular, what are the reasons for and against the adoption of EfW as a management option in Cleveland?

- How far do all waste management strategies fail to address reducing the origins of waste?

As the householder is seen to be the instrumental actor in a waste management strategy, the thesis intends to explore the influences and interactions of these players and the wider political economy in which they are situated. As will be explained later, the chosen theoretical framework will involve the field of political ecology. This approach
centres on the perspectives of such individuals and tries to explain their relationships with their environments against the background of the political economy.

1.3 Household waste

Household, or domestic waste accounts for 5% of the total amount of waste generated in Britain and is therefore not particularly significant in terms of the total tonnage produced. However, there are four main issues which illustrate the significance of household waste.

Firstly, household waste contains a great variety of materials, ranging from plastic packaging to old batteries, and this diversity means that implementing efficient strategies to recover materials from this waste stream is extremely difficult. Secondly, domestic waste is voluminous and of a low weight, and this low density causes particular management problems. For example, one tonne of household waste will use more landfill void than one tonne of construction waste. Thirdly, household waste is geographically widespread, since there are millions of homes across Britain, each of which produces just under a tonne of waste per annum. Lastly, over a third of household waste constitutes discarded packaging typically from fast moving consumer goods, such as food. Packaging has been criticised because it appears as a wasteful use of resources, since packaging is removed and discarded as soon as a product is consumed.

Since most citizens come into contact with household waste almost every day of the year, it has become a conspicuous reminder of the throw-away society in which we live. While domestic waste is an important issue, it could be argued that it has received more attention from environmental groups and concerned householders than it deserves when the total amount of waste produced is considered. However, the fact that such a small proportion of the total waste stream should attract so much attention indicates that domestic waste is a significant environmental concern for contemporary western societies. While the total domestic waste stream is considered in this thesis, particular attention is given to the third of this waste stream which comprises post consumer packaging.
1.4 Waste management at the crossroads

Historically, Britain (and other countries), disposed of their refuse by throwing into the street where it would be left to decompose or be washed away. As society progressed this waste was taken from the streets and disposed of in disused quarries and mines, now more familiarly known as landfills. Landfill management has developed considerably over time and the process now involves strict environmental controls. However, the process is essentially the same, whereby untreated waste is disposed through burial in the ground\(^1\). Britain disposes of 90% of domestic refuse through this process because it offers the cheapest means of disposal and there has been sufficient availability of landfill capacity. Currently, most areas of Britain have sufficient landfill capacity, although there are six trends which mean that landfill is becoming increasingly difficult as a method of disposing of domestic refuse:

- There is limited landfill availability close to urban areas, meaning that refuse from large conurbations has to be transported considerable distances producing high disposal costs;

- Obtaining planning permission to open or further develop landfills is becoming difficult;

- A tax has been introduced on waste disposed in landfills;

- There is wide public and community opposition to landfill;

- The EC waste management hierarchy adopted by Britain places landfill at the bottom, as the least favourable management method; and

- The impending EC Landfill Directive will require most wastes to be pre-treated prior to landfill disposal.

These pressures have forced Britain to adopt more proactive waste management policies which favour waste reduction and recovery as an alternative to waste disposal. While this thesis considers the issue of waste reduction, the main focus of the study is on the

\(^1\) There are also areas of raised land where waste is placed, sealed and covered with topsoil.
management of wastes with the intention of recovering value from them. At present, value can be recovered from waste by either recycling it into a new product, composting to produce a medium to improve soil, or by burning it to produce energy which can be used for heating or to generate electricity (EfW). Therefore, while there are obvious ‘push’ factors favouring waste recovery (i.e. it is not landfill), there are also a number of ‘pull’ factors which make recovery an attractive option:

- Local authorities have aspirational targets to recycle 25% of waste;
- Waste recovery businesses are becoming increasingly profitable;
- A number of legislative tools are in place to support recovery techniques;
- Recycling is popular with most members of the public; and
- There are legal requirements on some producers to recover packaging.

These issues will be explored further throughout the thesis. As will be discussed in Chapters 3 and 4, material recycling and EfW are the main techniques through which domestic waste can be diverted from landfills. Recycling involves the removal of materials from the waste stream, and these materials are then collected and transported to a reprocessing facility where they are manufactured into new products, or materials from which new products can be made. Energy from waste on the other hand usually involves the collection of mixed waste which is than transferred to an EfW plant where all components of the waste stream are incinerated at high temperature. Energy is then recovered from the resultant heat. While some EfW plants only incinerate a certain fraction of the waste, EfW as discussed here refers to ‘mass-burn’ incineration which involves incinerating the total household waste stream.

Although modern EfW plants recover thermal value from waste, Britain has in the past employed simple incinerators to reduce the volume of domestic waste prior to landfilling. A legacy of these incinerators - which employed limited pollution abatement facilities - is the hostility that the public can show when plans to build
modern EfW plants are disclosed (Department of the Environment, Transport and Regions, 1998). It is often the case that the public’s perception of incinerators is based on fundamental misunderstandings of the processes involved in the operation of a modern EfW plant (Petts, 1995:520; Porteous, 1997). These misunderstandings are often compounded by a lack of public participation at the planning stage (Petts, 1995). Public perspectives can be difficult to change and perceptions which associate any form of incineration with environmental pollution are often firmly established in people’s minds (Department of Trade and Industry, 1995a:34).

The low public opinion of EfW plants can lead to the NIMBY (not in my back yard) syndrome because many communities do not want waste facilities built in their neighbourhoods, even when they realise the need for such facilities. Lack of public acceptability has meant that numerous economic, environmental and engineering studies have been undertaken (e.g. Porteous, 1990), with the purposes of promoting EfW. These efforts are typically unsuccessful because the public have, on many occasions, opposed the construction of incinerators in their neighbourhoods (Department of Trade and Industry, 1995a and Petts, 1992 and 1995).

1.5 Case study in Cleveland

For reasons which will become clear, Cleveland was chosen as the location for the case study in this thesis. Cleveland is a compact county in the Northeast of England which has had a long industrial history based on steel and ship manufacturing. As a county, Cleveland has a combination of factors which lend themselves to creating problems for waste disposal. Cleveland has the highest population density of any shire county in England and Wales, it has few extractive industries, but a high concentration of specialist industries. This combination means that when measured on a per capita basis Cleveland is the highest generator of waste in Britain (4 tonnes per capita per annum). Clearly, not all of this waste is domestic, but the high level of wastes means that there is a great deal of competition for local management options such as landfill.

2 Participants in a recent survey by Waste Watch (1998) found that 98% of the public accept recycling as a good waste recovery option.
While there is potential to conduct this study in many other locations (see Appendix B), Cleveland is chosen for this case study for three key reasons. Firstly, EfW has already been chosen as a large scale solution for the county’s waste management. This dominance is interesting in light of current waste policy, which is moving towards integrated waste management (Chapter 3). Secondly, Cleveland has a high population density, it could, therefore be argued that this region is better suited to recycling, since it is easier to collect waste materials from a dense metropolitan population. Third, studies in the social sciences often focus on areas where there has been or are signs of local struggle against environmental hazards. While the role of local resistance movements is considered, the key objective of this study is to analyse the individual householders and ascertain their perspectives on waste management.

1.6 Situating the householder centrally

In recent years there has been a great deal of change occurring in waste management practices and in Britain’s legislative context for waste management. As an accompaniment to these changes, the public are increasingly being asked of their opinions about waste, and they are being asked to participate more in waste management, through collection of materials for recycling, for example. While a study based solely on the legislative changes in waste management could be justified, this study intends to focus more on the householder, examining their reactions to waste management issues, and the ways in which they are influenced by the broader context of waste management. Situating the householder centrally in this way is important because the changing context of waste management will mean that the role of householders may alter in a number of ways, directly and indirectly affecting waste management through their individual actions.

1.7 Political ecology

Individual experiences of waste do not occur in social, political, economic, environmental, or geographical vacuums, rather they interact with the diverse elements associated with waste at many levels to provide a context for local circumstances. The theoretical approach of political ecology, which is discussed in detail in the following
chapter, situates the householder centrally in its analysis of individuals and their interrelations with the political economy of waste.

Political ecology is concerned with the interplay of local perspectives of waste and the ways in which these influence, and are influenced by, broader waste management and environmental issues. This political ecology of waste, therefore, requires an in-depth analysis of the household and its occupants and the ways in which they interact with the broader political, social and economic context of waste. Household waste and its management is an issue with ramifications at many levels, it is an institutional issue for local, national and European governments, while also being a political issue from a global to a grass-root level. The composition of domestic refuse is determined by factors ranging from personal tastes, through regional or national cultures, up to the global prices for raw materials such as pulp, oil and metal ores. The management of waste depends on factors ranging across a number of levels from an individual’s environmental ideology, to national geology and global prices for raw materials and energy.

Prescriptive waste management practices applied at national or regional scales may be insensitive to differences between localities, each of which will each have its own particular waste circumstances. Applying waste management in this way can have negative social, environmental and economic effects since local circumstances are ignored. Political ecology is a particularly valuable approach for a study such as this because it takes into account the local situation and places it within the context of the region and the nation as a whole.

Several methods were employed in order to fulfil the research objectives and to satisfy the demanding theoretical framework of political ecology. Firstly, a number of in-depth and ethnographic interviews were undertaken. The in-depth interviews provided a broad context of the main issues surrounding the management of waste in Cleveland. These views are explored through a review of waste management policy which focuses on Britain and pays particular attention to waste management issues in Cleveland. The ethnographic interviews also provide specific insights of local perspectives of EfW, domestic refuse, and the Cleveland environment. These interviews also provide the
basis for Q Methodology which is the central research method used here to examine the perspectives of 108 of Cleveland's householders.

Q Methodology provides a novel means by which ethnographic approaches can be extended to enable participants to measure their own attitudes and views on particular issues, here relating to waste and the environment. While ethnographic techniques have been used extensively in political ecology, this methodology has never previously been employed in political ecology studies, and as such represents an exploratory use of this technique within this field.

1.8 Summary

This thesis will argue that the householder has a significant role in the management of domestic waste, and their perspectives, behaviour, and attitudes towards waste will have an important influence on waste strategies. The proposition which is made here is that there are a number of relationships between the householder and the political economy of waste. These relationships are important in defining and maintaining waste management ideologies. The next chapter discusses, political ecology, the theoretical approach which is used to examine individuals within the context of British waste management.
2. Political ecology and waste management

This chapter places this study within the context of relevant theoretical debates which will form the theoretical framework for the development of the thesis. Particular attention is given to the contributions made by geography, environmental sciences, and emphasises the chosen approach of political ecology.

2.1 Introduction

In essence, political ecology attempts to theorise the important linkages between the global political economy and local environmental issues. As Peet (1998:95) describes, political ecology attempts "to weld together issues of how communities are integrated into the global economy with issues of local resource management and environmental regulation and stability." In this thesis it is used to show how an understanding of these relationships may explain the response to the particular waste management issues faced by Cleveland residents. The use of the political ecology approach will situate the householder centrally in the analysis and try to explain the interactions between the household, individuals and the wider political economy of waste management in Cleveland. This chapter will therefore discuss key themes in political ecology which form the basis of the analysis.

As stated in Chapter 1, the issue of EfW will be used as a focus for understanding this interplay at various scales of analysis. Currently, Britain has a waste management policy which encourages the development of energy from waste as a means of recovering value from refuse and reducing its volume before landfilling. There are differing opinions about EfW, and these are effectively divided between those who see it as being an environmentally beneficial means of managing waste (Porteous, 1990), and those who believe it is an unnecessary hazard which competes with recycling (British Newsprint Manufacturers’ Association, 1995; Friends of the Earth, 1991 and 1992a). In addition to these differing opinions there have also been cases where local pressure has aimed to have EfW planning applications refused. As EfW is a contentious waste management issue which attracts differing opinions at various scales, it is used in this thesis as a
means of highlighting the interplay between the individual and the wider political economy of waste management within which they are situated. The variability of public responses to EfW must be explained *in context*, and the political ecology approach is a particular ‘lens’ through which it is possible to view local perspectives.

Other theoretical frameworks for analysing these relations could have been used. These could have explained siting decisions in terms of environmental justice (or injustice), perhaps as a result of the political economy of British waste management over which local people have little control. Equally, an approach which could have viewed EfW as a technological ‘hazard’ or a ‘risk’ to modern society could have been taken. The utility of these approaches has been demonstrated in studies reviewed later in this chapter. However, it is argued that political ecology provides a more appropriate framework for analysing human-environment relations from the level of the individual to the level of the political economy. The following sections will discuss the key areas of human-environmental thought which serve to form the basis of the political ecological approach.

### 2.1.1 Defining environments

Before political ecology is discussed in greater detail it is necessary to briefly clarify the use of the term ‘environment’. In assessing environmental literature, Cooper (1992), a British philosopher, invokes an important distinction between environments at different scales and this work is relevant to the human-environment tradition in geography. Cooper (1992) argues that the concept of ‘the environment’ in contemporary discussions about an ecological solution to the environmental crisis (such as the sustainability debate), is too large. What Cooper means by this is that no distinction is made between the original meaning of the word ‘environment’ which means the immediate surroundings, or *milieu*, of a person, animal, etc. and the contemporary meaning of the ‘environment’ which means the whole world, or biosphere. This ‘big’ definition, whereby everything, from “the street corner to the stratosphere” (Cooper, 1992:168), is included in the term ‘environment’. Cooper (1992) overcomes this problem of definition by terming the immediate surroundings of a particular organism *the environment*, and the whole biosphere upon which all organisms depend, *The Environment*. Such
distinctions are important for political ecology, which analyses human interactions at different scales. However, this study will adopt a modified version of Cooper’s (1992) classification. If the unaccompanied terms environment or environmental are used, they convey a generic or abstract meaning, relating to non-specific ecological concepts. Where specific scales are associated with the term then these will be named specifically (e.g. domestic environment, regional environment etc.).

2.2 Key themes in human-environment theories

Since classical times a persistent theme in geographical inquiry has been the relationship between people and the environment. Many theories have evolved which have attempted to explain the complexities of cultural, social and environmental factors, and their relationships to particular societies or regions (for an overview see Emel and Peet, 1989). Some approaches stress the social institutions which influence peoples’ actions, while others stress environmental factors and natural laws. The following section discusses the two key analytical perspectives in human-environment studies which were crucial to the evolution of the political ecological approach; human ecology and political economy.

2.2.1.1 Human ecology

Neo-classical economic theories are the dominant perspective in resource use geography according to Emel and Peet (1989) and Rees (1990). These optimising theories were first challenged in a coherent fashion by the Chicago School of geographers led by Gilbert White. In his analysis of the issue of floodplain management White (1945) argued that it was necessary to optimise both the economic and social resource on a floodplain to manage it effectively. This early work analysed human adjustments to floods in light of the United States 1936 Flood Control Act, which invested heavily in technological methods of flood prevention such as dams, dykes and levees. White’s (1945) investigations led him to examine a range of flood management strategies, evaluating each in terms of its effectiveness. From these evaluations, he hoped to determine whether the 1936 Act would lead to an increase or decrease in flood related damages. Would increased expenditure lead to a new sense of security, resulting in
flood plain encroachment and development, or would people avoid flood plain development?

White (1945) isolated the flood plain problem as: "...how best to readjust land occupancy and flood plain phenomena in harmonious relationship" (in Kates and Burton, 1986:16). This problem existed because the three public measures for flood prevention (engineering, disaster relief and flood forecasting) were being implemented incorrectly. What was needed, White argued, was a more comprehensive approach to alleviating the hazard of flooding which moved from examining just economic relations towards introducing human relations to the floodplain discourse. In his reappraisal, White (1945) merged the engineering, disaster relief and flood forecasting approaches to the flood problem in a fashion which aimed to both maximise the economic use of the flood plain resource and minimise social costs associated with flooding.

White's early work was significant because of the emphasis it placed on assessing all forms of adjustments before the most beneficial adjustment, or combination of adjustments, could be assured. White identified that human-environment relations on the flood plain are very complex and thus he rejected the simplistic notion of economic justifications for flood plain occupancy. Instead, White argued that a valuable flood control programme for the USA "...will demand an integration of engineering, geographic, economic, and related techniques" (ibid. p.24). The pragmatic approach to resource use and hazardous events taken by the Chicago School continued to develop under the summary heading of human ecology throughout the post war years, and received a great deal of funding from both the private and public sectors (White, 1945, 1963, 1961; Kates, 1962; and Burton and Kates, 1964).

In confronting neo-classical theory, studies of resource use within the paradigm of human ecology include non-economic considerations in the debate (White, 1961, 1963; Kates and Burton, 1986; and Burton et al., 1978). This applied perspective tends to focus on the local scale, since it is here that it is most expedient to detail and explain human interactions. Human ecology examines local issues at the expense of giving due attention to broader political, economic and social structures. A 'lack of theory' was often deliberate in human ecology, with proponents trying to get along without theory...
when necessary often on the grounds that policy makers need clear answers (Braybrooke and Lindblom, 1963). The work of White and other human ecologists (e.g. Kates, 1962) formed an important contribution, by demonstrating the limitations of traditional cost-benefit analysis for understanding human decisions in risk prone environments and the importance of social causality. Yet the approach lacks theories which are capable of addressing process, organisation, or change. It is this deficit which led neo-Marxists to question the validity of the human ecology approach in the late 1970s.

2.2.1.2 Political economy

Core critiques of human ecology came from neo-Marxist scholars such as Watts (1983a), Harvey (1977), Hewitt (1983), and Susman et al. (1983). These scholars argue that the central problem with human ecology was its viability to examine effects of broader structures which influence local resource users and/or human interaction with hazardous environments. Hewitt (1980) believes that the original idea of a human ecological framework is adequate for explaining these broader structures, but “the actual work, despite the expanded number of topics, has remained too narrow” (p.308). As a consequence the broader political and economic context in human ecology is “never been paid more than lip-service” (p.308).

Hewitt (1983) offers a further critique of the work undertaken in human ecology by arguing that its core failings lie deeper in its societal construct, and not necessarily with its scientific method. For example, he points out that a great deal of the work undertaken by the human ecologists in the 1960s and 1970s was funded by the governments and institutions which were themselves the subject of the investigations (see for example White’s (1963) work with the United Nations Panel on Integrated River Development). Such arrangements, Hewitt (1983:8) argues, compromise academic freedom and unbiased reporting, and this leads him to explain that the “...‘natural science-technological fix’ approach to hazards [is] itself, essentially, a socio-cultural construct reflecting a distinct institution-centred and ethnocentric view of man and nature”.
Hewitt (1983) argues that the accepted means of studying and interpreting human action are matters of social order, and are founded in a deeper social construct. As such, the objective ‘facts’ produced in such studies, although useful for pragmatic recommendations, are loaded with the vested interests of the sponsors and fail to recognise deeper social structures. Human responses to the environment are not, therefore, objective facts which arise as a consequence of humans interacting with a "...limiting, non-dynamic and generally stable" environment at the local level (Watts, 1983b:235). People make socially and politically informed responses to changes to a dynamic environment, they do not operate within discrete and non-dynamic environments which are either ‘hazardous’ or ‘normal’.

In his explanation of natural hazards, Hewitt (1983) adopted a political economy approach to stress the importance of social causation in hazards. He found three key areas where an alternative to a human ecology explanation of hazards could be found. These are summarised as follows:

- natural hazards are not explained by, nor uniquely dependent upon the geophysical process that may initiate damage;

- hazard is seen to depend upon concerns, pressures, goals, risks, and above all, orchestrated social changes that are tangential to, if not wholly indifferent to the particular society-environment relations where disaster has occurred;

- natural disaster, its causes, internal features and consequences is not explained by conditions or behaviour peculiar to calamitous events, but depend upon the ongoing social order, its everyday relations to the habitat and the larger historical circumstances (Hewitt, 1983:24-5).

This explanation focuses more on the overarching structures of society with less stress being placed on the perspectives of local resource users. Emel and Peet (1989:71) summarise this intellectual shift when they explain that in political economy “...stress is laid not on the psychological attributes of peasants, who traditionally had a series of effective response strategies, but on the present precariousness of the rural poor, caught in a simple reproduction squeeze.” This intellectual shift is further illustrated by Watts
(1983a; 1983b) who studied the 1969-74 North Nigeria droughts and the human-environment relations of the native Hausa. Watts found that previous famine studies relied on technocratic explanations, and had a serious neglect of underlying historical and political economic structures.

In his study Watts (1983b:249) illustrates that prior to the arrival of the colonials, security from climatic risks was "...grounded in and inseparable from the architecture and constitution of the social relations of production and were indeed instrumental in the reproduction of society at large." Colonials, however, introduced a cash economy and the resultant extraction of surplus value from the economy degraded the social risk buffers and as a consequence vulnerability to environmental hazards increased. While there had been many droughts in Nigeria prior to the arrival of the colonials, Watts (1983a) argues that their arrival led ultimately to a vicious cycle of "...vulnerability and marginality [which] is highlighted in four major famines which occurred during the colonial period in 1914, 1927, 1942 and 1951" (Watts, 1983b:249). The importance of this work is in its recognition of social structures in human-environment relations and the centrality of these structures for the Hausa who relied on them to reduce the risks brought by drought.

Like Hewitt (1983) and Watts (1983a), Susman et al. (1983) take issue with human ecology and offer an alternative view of a supposed 'natural' disaster. Rather than stressing the importance of natural phenomena Susman et al. (1983) emphasise the role of social and political order as causal factors in 'natural' disasters. Susman et al. (1983) incorporate political and social theories into a concept of marginalisation which they use to explain disasters. After extensive research Susman et al. (1983) found that during the 50 years preceding their study the number of natural disasters had increased, but there had been "...no major geological or climatological changes over [this period which] adequately explain the rise" (1983:265). Susman et al. (1983) explain this increase in hazards and the associated rise in economic and human loss by inverting the dominant perspective, and instead explained that suffering as a result of hazards increased due to the over-development created by capitalism. Like Hewitt (1983), Susman et al. (1983) argue that the dominant Western model of disasters is 'back to front' and the
marginalisation which results from the uneven development of capitalism increases human suffering when natural disasters occur.

The neo-Marxist perspective on the social causation of natural hazards employed by the above scholars is expanded by Blaikie (1985) in his application of the framework to examine soil erosion in developing countries. Like Hewitt, Blaikie felt that the social causes of hazards were being neglected in a research area which was dominated by technological interventions. To redress the balance, Blaikie outlines a number of nested processes or substructures which, he says influence and lead to certain resource use patterns. For example, a peasant herder may be blamed for keeping too many cattle, when in fact it is the political economic influences acting on the herder which has forced them to increase herd size. This exploitation of resources and labour results in a shift of cultural, economic and political control from the local to the national level as beef is exported and subsistence foods imported. Thus, Blaikie argues that land use choices are often out of the hands of the people who directly use the land.

The significance of Blaikie's work lies in his development of the linkages between resource use, economics, institutions, individuals and society in what he calls "chains of explanation" (Blaikie, 1985). Examining these linkages led Blaikie to conclude that specific management approaches for erosion, or indeed any serious environmental problem, are of limited use. Instead, emphasis should be placed on tackling the social, economic and political origins of environmental problems.

In criticising human ecology, the neo-Marxist perspectives taken by Watts, Hewitt, Blaikie and others have developed into theoretical frameworks which focus overtly on political, economic and social structures. While this focus was partly a reaction to human ecology's lack of theory, it led political economic approaches to neglect important local human factors which human ecology often explained in detail. Bassett (1988:455), sums up the overtly structured nature of political economy when he argues that the approach provides only a "...descriptive check list of social and economic factors... which are summarily described as the reasons for land use conflicts." What is required, therefore, is an approach to human-environment relations which examine overarching structures, while also appreciating the interconnections between these.
Chapter 2: Political ecology and waste management

overarching themes and the local environment. This thesis will attempt to identify such structures and relationships between waste management and householders in the context of Cleveland.

Blaikie teamed up with Harold Brookfield in an attempt to address the overtly structural approach in political economy which lead to a neglect of the local scale in political economy. In *Land Degradation and Society* (1987) Blaikie and Brookfield set out their approach for analysing human-environment relations which result in land degradation, this approach has been widely acclaimed as the founding statement in the approach known as regional political ecology.

It is important to note at this stage the academic pursuits of Brookfield before he teamed up with Blaikie. Brookfield worked with American cultural ecologists, both in North American universities and on shared field projects in Pacific Asia. Cultural ecology is a sub-field, or speciality-group, within the larger human-environment arena of geography which has strong interdisciplinary connections with anthropology, archaeology, and ecology. Butzer (1989: 192) explains how contemporary cultural ecology is concerned with “...how people live, doing what, how well, for how long, and with what environmental and social constraints.” Research by Butzer (1980) on the rise and fall of Egyptian civilisations exemplifies cultural ecology, where a plethora of cultural, social and political causal factors are taken into account to show how civilisations fluctuate through states of stability and instability over time.

Brookfield provides a central link between the structural political economy previously employed by Blaikie, and methods in cultural ecology. Blaikie and Brookfield complement one another in bringing together the social and political theory of political economy with the applied and local based specialities of human and cultural ecology. The cross-over of ideas between cultural and political ecology are recognised by advocates of both approaches; Butzer (1989:203), believes that the perspectives of Watts, Blaikie and Brookfield have moved “...cultural ecology from the context of a

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3 The term political ecology has been used a number of times previously and Atkinson (1991) traces the development of the term. Prior to Blaikie and Brookfield, political ecology was used in the human-environment field by Hecht (1982) and Place (1985), while Peet and Watts (1996) trace its use back to Wolf (1972) who integrated land-use with a local-global political economy.
small, closed society into a broad, hierarchical system.” Equally, the influence of cultural ecology can be seen in many political ecology works (Zimmerer, 1993; Herskovitz, 1993; and Muldavin, 1996).

2.3 Political ecology

What distinguishes the political ecology approach from that of human ecology is the detailed attention to the relations between different levels of political and economic activity. It is these interrelations which give Blaikie and Brookfield’s approach its strength, which they use to show how processes at one scale affect those at another, and how this enables them to observe “...conflict and contradiction in the spheres of production, consumption, and nature...” (Emel and Peet, 1989:57). In essence, Blaikie and Brookfield define their political ecology as an approach which:

“combines the concerns of ecology and a broadly defined political economy. Together this encompasses the constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself” (Blaikie and Brookfield, 1987:17).

The key to political ecology is in seeking to look for the reasons behind certain human-environmental interactions by analysing “a suite of processes, all operating at different scales and with different periodicities” (Batterbury, 1997:31). Furthermore, such processes are best viewed “through a nested scale of analysis which begins with the actions of [the] individual ... and considers the equally important influence of these wider processes” (Batterbury, 1997:32).

Blaikie and Brookfield’s (1987) approach facilitated an examination of the interactions between groups within society, under certain conditions of production which influenced land use strategies leading to actual or potential land degradation. Blaikie and Brookfield (1987:155) argue that this contextual analysis is vital because “...the individual ‘land manager’ cannot be viewed in isolation from the social relations of production, or the access to and control over the means of production and the allocation of the product among various groups.” By situating the land manager centrally Blaikie

\footnote{Blaikie and Brookfield (1986:74) define land managers as people who have “control of land, labour, inputs and outputs; who decides upon cropping and grazing strategy, and upon investments...”}
and Brookfield's work facilitates an examination of the interactions between global, corporate, national, regional, local and individual levels.

A number of studies focused in the Third World utilise Blaikie and Brookfield's research template of political ecology, where the actions of local resource users are explained through situating them at the centre of the global political economy. While there is a large body of work on this subject (Peet and Watts, 1993; Emel and Peet, 1989; Bryant, 1992; Bryant and Bailey, 1997), it is essential to examine some critiques of this work in order to determine the directions in which political ecology has developed and how such approaches relate to this thesis.

2.3.1 Critiques of political ecology and new directions

While the human-environment tradition in geography has evolved through examinations of a broad array of subject matter and case studies, both in developed and developing countries, political ecology has tended to focus on rural, agrarian Third World issues (Bassett, 1988; Bryant, 1992; Herskovitz, 1993; Jarosz, 1993; Watts, 1983b; and Yapa, 1993). This focus could in part (but not wholly) be attributed to the early studies in political ecology such as those by Watts (1983a and 1983b) and Blaikie (1985) which were firmly based in rural societies in developing countries. Whatever the reason there has been a backlash from geographers and anthropologists who feel a general political ecological approach should be extended to the study of urban and industrial cultures. At the same time, the broader use of the term 'political ecology' and 'environmental politics' (see earlier footnote) to describe the political dimensions of environmental issues, has been more widely used to good effect (M. O'Connor, 1994).

However, the original focus on Third World and land based issues are explanations which emphasise poverty, and specifically the onset of poverty, following the introduction of capitalist economic relations in rural Third World regions. Scholars then argue that this poverty is the central causal factor which leads to environmental deterioration. While explanations based on poverty can provide some, but by no means complete, explanation in the Third World, they provide much less explanation of environmental degradation in the First World where poverty is often less of an issue.
This point is developed by Peet and Watts (1996) who argue that affluence and the accumulation of capital, can lead to as much, if not more environmental degradation. Household waste provides a useful example here because it increases in proportion to the wealth of a population. For example, New Yorkers produce four times more domestic refuse than Cairo residents (Gourlay, 1992:33). Disposing of this waste, which arises as a consequence of ‘over’ consumption leads to environmental degradation. Obviously the more waste which arises as a consequence of affluence the greater the problems faced with its disposal.

The question that arises therefore is whether or not a political ecology approach is able to examine human-environment issues which are not based in rural agrarian societies and not based on poverty? As Peet and Watts (1996:7) question, how can poverty or political ecology “…help explain worker injuries in the maquila plants in northern Mexico, toxic dumping in Nigeria, or urban water pollution in Turin?” In addition, is such an approach appropriate to analyse waste disposal problems in Britain?

How may political ecology develop from an analysis based on poverty in Third World agrarian societies to an approach which can be successfully applied to analyse human-environment relations in the First World? Blaikie (1994) usefully summarises three main areas which illustrate how environmental issues are also social issues. These three areas form a useful framework for discussing the key works in political ecology which contribute to an analysis based in the developed world. According to Blaikie (1994), environmental issues are also social issues for three main reasons:

- People experience environmental change, but different people experience this change in different ways;

- environmental issues require a political vehicle before they become an environmental issue, and such political vehicles can operate at any level from the local to the global; and

- understanding environmental issues depends on the actors involved and how they interact with the global environment and their immediate local and regional environments.
Environmental problems can therefore be seen as involving a complex mixture of plural perspectives, operating in increasingly politicised contexts. In order to attain a more sophisticated understanding of environmental problems it is essential to examine the socio-politic and economic circumstances which contextualise such problems.

2.3.1.1 Experiencing environmental change

Studies in political ecology illustrate how different people experience the environment and how these experiences influence their actions, whether these are ones of resignation, struggle or respect for the natural world. One of the most important developments in this area of political ecology is that there are multiple discourses about the ways in which people experience the environment.

The different aspects of these multi-teneted discourses are often irrational and contradictory. Therefore no single view, or experience about the environment can be said to dominate. For example, Blaikie (1994) explains that some people may take out a subscription to Greenpeace, while also keeping their second car. Recognising these pluralities of environmental experiences is important in political ecology because they are often irrational and contradictory, as Blaikie (1995:209) states: "Only by acknowledging multiple views, understanding the politics of how actors present their views [of the environment] and pursue their projects, can current....thinking be literally brought down to earth." Again, this is no more evident than with individual perspectives of waste and the environment, as many people participate in recycling but then undermine any good intentions by driving several miles to a recycling facility. It will become evident throughout this study that Cleveland residents have a plurality of views about the environment in terms of their perceptions and behaviour, and these are examined in relation to waste and the environment in Chapter 6.

\[\text{A large body of work has also looked at gender and environmental perspectives, this thesis does not address this literature because it is not concerned with the gendered nature of the environment (Agarwal, 1995; Leach, 1994; Mohanty, 1991; Rocheleau, 1995; Schroeder, 1993; Townsend, 1995; Carney and Watts, 1991; Carney, 1996; and Seager, 1996).}\]

\[\text{This study provides another example when a Cleveland activist who talked in an interview for over an hour about the pollution in and around her neighbourhood, but chain smoked throughout the interview.}\]
In addition to these plural views of the environment, it is necessary to situate environmental change within a historical perspective. The political ecology approach recognises the importance of historical environmental change in examining human-environment relations. For example, Blaikie and Brookfield (1987:239) argue that the relationship between the land manager and nature must be considered in a "historical, political and economic context." A body of literature specifically examines the historicism of environmental change and the regulatory economic tools which have often been introduced to try to control this change (Gandy, 1993; Cronon, 1992). This literature is not addressed here, but the importance of situating environmental issues and historical environmental relationships is recognised. As a result, Chapter 3 discusses the historical context of waste management in Britain, and Chapter 4 briefly considers the history of Cleveland’s environment in relation to waste, particularly its recent history of toxic waste movements.

2.3.1.2 Politicisation of the environment

In order for environmental issues to attain a level of importance in society, they need a political vehicle. Such vehicles come in many forms and guises throughout the world, from the global activities of Greenpeace, political forums such as UNCED, and local action groups who work to protect the environment at local meetings or through direct action groups such as Reclaim the Streets. The last fifty years has seen the numbers and types of political vehicles increase and as a consequence the environment has become increasingly politicised (Blaikie, 1994; 1995). In 1971, Friends of the Earth fuelled the politicisation of domestic waste when they campaigned outside Schweppes in London demanding that they “Bring Back the Bring Back” following the introduction of non-returnable bottles by Schweppes. In many ways, this marked the beginning of a period of concerted action in Britain against corporate waste and environmental damage. Chapters 3 and 4 of this thesis illustrate that waste management is now politicised across most levels from global forums such as the UNCED, through to EC policy, and down to the individual level of the householder.

Parallel developments in media and information technology over the past decades have increased the effectiveness raising awareness of environmental issues and provided new
vehicles for politicising the environment. For example, indigenous Nigerian farmers use 'camcorders' to record the destruction of their farmlands by oil pipes, while groups such as Reclaim the Streets organise their direct actions against the domination of the car on the internet. Many environmental groups of all sizes have had their voices heard and amplified by these technologies.

It is clear that studies utilising a political ecology approach must give particular attention to the politicisation of the environment, how it manifests itself at many levels, and the way in which it is embedded in social structures. Despite this requirement, Peet and Watts (1993:239) argue that the political ecology employed in Third World studies has little real understanding of politics and "...there is no serious attempt at treating the means by which control and access of resources or property rights are defined, negotiated, and contested within the political arenas of the household, the workplace, and the state...". Despite this claim, more emphasis has been placed on the politicisation of resources and the environment since Blaikie and Brookfield's original studies in the mid 1980s. This detailed treatment of politics in human-environment relations can be divided into two broad levels: politicisation at the local and household level (Agarawal, 1992; MacKenzie, 1991; Carney, 1996; and Schroeder, 1993 and Schroeder and Suryanata, 1996), and the politicisation of the environment at the level of regions, states and multilateral institutions (Rich, 1994; Sand, 1995; Peluso, 1993; and Seager, 1993).

Local struggles over environmental degradation have been discussed a great deal in the environmental justice literature, which has a different intellectual ancestry dating from post 1960s ecological Marxism. While these studies are discussed further below, it is important to acknowledge the important role that environmental justice movements have played in raising the political perspective of the local environment. Many of these movements have focused on waste disposal siting issues and they are, therefore, particularly relevant for this project.

Closer attention to politics in political ecology is, therefore, necessary when one considers the politicised character of the environment (Blaikie, 1994; and Pepper, 1984). Political ecology allows the examination of political factors operating at different
scales and in different socio-economic groups. This is important in a study such as this which analyses the contentious and politicised issue of waste and its management.

2.3.1.3 Understanding environmental issues

The ways in which different actors understand environmental issues depends very much on their social, academic, political and economic background. While there are common themes which run between grass-root justice battles in the First World and environmental struggles in the Third World (Pulido, 1996, and Rocheleau et al., 1996), disparity in environmental understanding is common.

While many academics and environmental activists have illustrated how our dominant political and economic institutions subsume 'the environment' as an issue, some have directly challenged the hegemonic view of environmentalism (Dobson, 1990; and Pulido, 1996). Pulido's (1996:21) views are interesting here because she challenges the environmentalism practised by groups such as the Sierra Club and the Audubon Society, as they only really represent the concerns of white middle class conservatives and distance themselves from urban and industrial problems experienced by minority groups. Pulido's aim is to develop an "environmentalism of everyday life" (p.30), and in so doing she argues that such a perspective of environmentalism must also include an understanding of livelihood, poverty and race etc. in addition to environmental debates. This richer view of environmental motivations and struggle is an important addition to political ecology because it begins to highlight some of the common themes of livelihood, as well as the similarities between environmental struggles in the Third and First worlds.

2.3.1.4 Revisiting political economy

As discussed above, the theoretical core of the political ecology approach is the use of premises and categories drawn from political economy. Bryant (1992:13) argues that political ecology often "...fails to attribute explanatory significance to ecological factors", but in their later work, Blaikie and Brookfield (1987) emphasise the important role of states, NGOs, multinationals and other bodies in influencing environmental outcomes. To some extent these failures were inherent in Marx's political economy,
which has weaknesses in theorising the impact of the environment on social relations. Bryant argues that the changed social relations, which occur as a consequence of the expansion of the economy, produce new and complex dialectics of nature-society relations which political ecology can sometimes fail to theorise.

A number of works have sought to address these weaknesses in political economy, both at a broad philosophical level (Benton, 1989, 1993; Grundemann, 1991; Brennan, 1993; Leff, 1995; and Redclift, 1987a) and at a more theoretical level (J. O'Connor, 1988 and 1994; M. O'Connor, 1993 and 1994; Leff, 1995; Salleh, 1994; and various issues of CNS). All of these debates cannot be given justice in this thesis, however it is important to briefly discuss the work of a group of scholars known as ecological Marxists who have revisited political economy at a theoretical level. It is important to discuss this work here because it provides some explanation of capitalist relations in the developed world.

The work of ecological Marxism is interesting in political ecology because it tries to extend political economy in a way which makes it "..capable of comprehending the relation of ecology and politics without simply subsuming the one under the other" (Hayward, 1994: 11). This process is important for political ecology which has evolved in a way that tries to avoid either economic or environmental determinism. Utilising a political economic framework which avoids these determinisms elaborates the explanation of human-environment relationships.

Central to this re-theorisation of political economy is the notion of the second contradiction in capitalism which is introduced by J, O'Connor of the 'CNS group'. While the first contradiction is concerned with the destruction of labour, the second is concerned with the destruction of the environment. Both the first and second contradictions theorise how the current economic paradigm destroys its conditions of production. O'Connor (1988:25) summarises the second contradiction as: "...the way that the combined power of capitalist relations and productive forces self-destruct by impairing or destroying rather than reproducing their own conditions." Therefore, as a

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7 Capitalism, Nature, Socialism (CNS) is a journal dedicated to exploring issues involving Marxism and ecology
result of economic development, there has been widespread environmental degradation, and ecological Marxists argue that the evidence of this contradiction is everywhere evident both globally and locally.

Ecological Marxism has looked primarily at the inherent contradiction of capitalism to theorise the ecological crisis. Giddens (1995: 13) also saw the crisis in broad terms: “The ecological crisis is a crisis of a ‘damaged modernity’, but should not be identified solely with environmentalism.” This broader perspective concurs with Pulido’s argument to broaden the hegemonic definition of environmentalism to include livelihood struggles, and indeed it concurs with political ecology’s requirement to situate local resource users within a broader social, economic, and political framework.

Tied in with this re-theorisation of political economy and political ecology’s bias toward poverty is the observation made by Bryant (1992) that political ecology has often neglected sources other than social change which may also contribute to environmental change. Bryant (1992: 14) suggests that a neglect of the other sources of environmental change, such as the role of institutions like the state, market and property rights, “...devalues the role and importance of state and interstate forces.”

These criticisms question the original aim of political ecology which is concerned with “...how to analyse the interrelations between local-level field studies and macro-level processes” (Bassett, 1988: 470). While Bryant emphasises broader processes, Moore (1993) critiques the approach for failing to address micro-scale processes, which Moore argues is a consequence of political ecology’s employment of a ‘macrostructural’ framework of analyses. Debates such as these are common place in political ecology, and achieving a balance between a political economic framework, while avoiding the “structural tendency dominating political ecology” (Moore, 1993: 382) is a constant challenge. In Liberation Ecologies, Peet and Watts (1996) move this debate in political ecology forward when they discuss a theoretical engagement between post-structural theories and political ecology.
2.3.1.5 Environmental Justice

As outlined, the genealogy of society-environment approaches in geography has, in simple terms, moved from a human ecology perspective (which was vital in bringing together for analysis the physical environment and human occupancy of this environment), through to political economy which has focused on the influence of larger social and economic issues in determining local resource use. Finally, political ecology has developed to examine human resource use issues as responses in context to the meso (managers) and macro (state) scales (Palm, 1990). Yet the centrality of grass-root groups and the individual in human-environment relations are key issues in a further critique of political ecology, and this is now discussed.

In spite of the firm intentions of advocates of political ecology to analyse the interrelations between the micro, meso and macro scales, Bryant (1992) argues that the approach has underestimated socially disadvantaged groups, such as peasants, and the power they hold in society. While managers and the state undoubtedly influence local resource users, activities at the micro scale also influence decisions made at the managerial and state levels, through recursive processes. To illustrate this point Bryant (1992:14) quotes Giddens: "..all power relations, or relations of autonomy and dependence, are reciprocal: however wide the asymmetrical distribution of resources involved, all power relations manifest autonomy and dependence 'in both directions'." This is clearly the case when one considers the environmental justice literature.

Cutter (1995) traces the origins of the environmental justice movement back to North Carolina when, in 1982, African Americans mobilised a coalition to protest against plans for a landfill which was to be used for the disposal of PCB-contaminated soil. Although this protest was unsuccessful it marked the beginning of grass-root environmental justice movements in America which soon evolved in other parts of the world. While environmental justice is often the preferred term to describe environmental inequalities, the initial term coined by Benjamin Chavis, who headed the United Church of Christ's Commission for Racial Justice, was environmental racism. While this body undertook ground breaking work based on racial and environmental inequalities, studies based on this approach have moved beyond racism to include other
sectors of society who have environmental rights withheld, such as women, children and the poor and hence this literature has a broader title (Cutter, 1995).

Like the movement itself, environmental justice literature developed from a pragmatic perspective which linked siting injustices with minority populations, typically racial and ethnic minorities (Bullard, 1990; United States General Accounting Office, 1983; and the United Church of Christ, Commission for Racial Justice, 1987). While this pragmatic approach enlightened academics and helped progress the movement itself, it has led to environmental justice literature being criticised for lacking theoretical rigour (Cutter and Solecki, 1996). In facing this lack of theory some academics have, however, addressed theoretical questions in debates, exemplified by Cutter (1994), Gould et al. (1996), Pulido (1996) and Harvey (1996). Although Cutter and Solecki (1996) have turned to the theoretical constructs of hazard geography to address this weakness of environmental justice literature, the work of Gould et al. (1996) and Pulido (1996) approach this issue with reference to political ecology.

Where much literature in environmental justice has been criticised for concentrating on the justice movement itself rather than the context in which the movement arises, the work of Gould et al. (1996) and Pulido (1996) concentrate on the context in which environmental movements arise in much the same way that political ecology contextualises resource users in the Third World (Pulido, 1996). To illustrate this, Gould et al. compare environmental justice movements with citizen worker groups. Both are similar in that they are protesting against their lack of environmental rights over issues such as the environmental toxicity generated by waste dumping. Unlike environmental justice movements, citizen-worker groups do not aim for a total ban on environmentally deleterious activities, rather they demand a reduction in activities which degrade their local environment or jeopardise their health. Gould et al. (1996) argue that the key to understanding this difference lies within the context of the movement. Citizen-worker groups favour reductions rather than bans because they recognise the economic importance of polluting activities for their local economies. A total ban, therefore, would lead to job losses and a reduction in the local economic base (Gould et al., 1996:2). The economic and social context (jobs and money) of a local
struggle are as important as the environmentally deleterious activity which is targeted by a community. This recognition ties in with the broader definition of environmentalism proposed by Pulido (1996).

It could be argued that it would be more appropriate to take an environmental justice perspective in this study. However, this is not necessarily the best approach for two main reasons. Firstly, the aim of this thesis is to analyse human-environment relations in terms of waste and the environment, in a context where the primary focus is not on a particular ‘struggle’. While there is evidence of environmental injustice taking place in Cleveland, the region is not a ‘hot-bed’ of political activism and resentment about local household waste management strategies. Secondly, environmental justice literature has tended to focus on the movements themselves, often at the expense of studying the influence and actions of individuals. However, the householder is central to the management of domestic waste in this study, although individuals may not necessarily be associated with any group seeking ‘environmental justice’.

Having said this, the observations made by Gould et al. (1996) of citizen-worker groups, and the theoretical insight of Pulido (1996) are particularly relevant for this study because Cleveland hosts one of Europe’s largest petro-chemical complexes, a number of heavy industries, and a number of waste management facilities. Although there are protest groups in Cleveland (see Chapter 4), most are concerned with the impacts of waste imported from outside the region, or from facilities which are seen to be unnecessary. Industrial and waste facilities which are linked to the Cleveland economy are tolerated because they are essential for maintaining the region’s economic base.

While environmental justice literature does not provide an adequate theoretical framework for this study, it is evident that some areas of the human-environment tradition in geography and environmental justice literature are converging. While some advocates of environmental justice are seeking theoretical rigour in the human-environment field of geography, this field, and particularly political ecology, can gain useful analytical insights from justice literature. Environmental justice literature can provide political ecology with further analytical tools with which to examine human-environment relations from local to global contexts.
Chapter 2: Political ecology and waste management

It is clear from this discussion that there are no well defined boundaries within or outside the realm of geography to the approach summarily known as political ecology. While this chapter has discussed some of the critiques, developments and ongoing debates in and around this rapidly developing sub-field of geography, it is best to illustrate the utility of the approach by illustrating how it is to be used in this study. As Blaikie (1995:26) points out:

"It is much easier to demonstrate swimming by doing it than by standing by the pool explaining how it should (or should not) be done."

2.4 A political ecology of waste

Having reviewed key themes in the human-environment tradition in geography, the role of this final section is to illustrate how the political ecology approach will be used as the theoretical framework for this study of domestic waste management. The aim here is to illustrate how political ecology can provide an aid to understanding the ‘nested scales’ and relationships that may determine perceptions and practices in household waste management in Britain.

Domestic refuse has become a major issue of concern to society because it poses a real or perceived threat to ‘the environment’. While household waste is a social and environmental problem, it is perceived as being primarily an environmental problem because it triggers the most concern when it interacts with the environment at the point of its disposal. This has resulted in numerous studies which analyse waste only when it interacts with the environment (Strange, 1994b; Porteous, 1994a; Petts and Eduljee, 1994; Newsday, 1989; Friends of the Earth, 1992a; Curzio, et al., 1994; Bailey and Hawkins, 1983; Blumberg and Gottlieb, 1989; and Crooks, 1993). However, waste is not only an issue at the point of its disposal. Instead, the household, politics, the state, the market, and producers influence waste and waste management practices. This study aims to shift the emphasis in waste management analysis from a disposal-centred perspective, to one which emphasises the broader relationships between social and political structures and householders, and how such interrelationships may affect decisions in formulating waste management strategies.
It will be argued that the issue of household waste illustrates human-environmental impacts at many different levels and these levels interact with one another in different ways. The first aspect of a political ecology of waste is to identify the different activities, their scales and some of the associated interactions. A simple illustration of this concept is given in Figure 2.1 below.

Many of these scales of analysis are discussed in the next two chapters. The more difficult task is to explain these relationships and how they operate from day to day. It is the aim here to introduce the key themes central to this task, while later chapters discuss in detail the interrelations between the different levels of activity in this political ecology of household waste.

2.4.1 Key themes in a political ecology of household waste

It is important that the householder is situated centrally in the political ecology approach to be used. Situating the householder centrally is essential in an examination of household waste because it is a ‘non-point source’ of pollution, meaning that household waste is produced at many millions of geographic locations, not at a particular plant or
locality. The nature of household waste, therefore, means that consumer choices and individual behaviour represent important variables in its management (Curzio et al., 1994:2). The influences which individuals have on waste management cannot be summarised at this early stage (see Chapter 6), but the key themes of the household waste context are summarised below.

2.4.1.1 Politics and the environment

The politicisation of the environment in Third World political ecology has tended to focus on grass-root political struggles where the aim is to resist the introduction of global economics to local agrarian economies. Since this study is based in the First World, and has tried to avoid an area where struggle over the local environment is obvious, resistance to the global economy is less relevant. In spite of this, the politicisation of the environment within a global economic context is still central to this First World political ecology, because the processes are similar in all environments.

It is important to acknowledge the politics of waste and the environment since this politicisation has been, and continues to be, responsible for the development of waste management legislation. While such legislation has led to the improvement of waste management, in some cases it has resulted in management practices being steered away from sound economic and environmental values. This was demonstrated in Germany as a result of the Packaging Ordinance which resulted in a huge effort to collect waste materials for recycling. The success of these collections overwhelmed the reprocessing industry, and thus many collected materials were landfilled or exported. Although Germany has now resolved many of these problems, it could be argued that the hasty response to political pressure on household waste led to the introduction of an inappropriate solution to the problem, leading to further environmental degradation through the increased cost of collection and landfill. While many local and international environmental groups have fought to politicise waste, policy reactions to this political

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8 For comparison, a 'point source' of pollution would be a large power station which emits both gaseous and solid wastes from a single location.

9 The Packaging Ordinance was passed in Germany in 1991 and it requires the majority of post-consumer packaging waste to be recycled.
Chapter 2: Political ecology and waste management

pressure can sometimes lead to more environmental damage than was previously the case\(^\text{10}\).

2.4.1.2 **Commodification of waste**

A primary concern with political ecology studies in the Third World is with the commodification of the local environment which occurs when the economic organisation of a capitalist economy is introduced to a non-capitalist economy (see section 2.2.1.2). For this First World political ecology, the concern is not with the arrival of a capitalist economy, but with the expansion of the economy and its contradictions. This expansion leads to the commodification of two key areas in waste management. Firstly, the waste itself becomes a commodity, and secondly the means of managing this waste are increasingly commodified.

In relation to commodification (Oxford English Dictionary, 1989), waste is partly defined as "unserviceable material remaining over from any process of manufacture; the useless by-products of any industrial process." This definition no longer holds true for an increasing proportion of waste, which has instead become a saleable commodity or resource. This means that waste is now more accurately described as "feedstock" or recyclate. While this commodification of waste is returned to later, it is worth demonstrating the saleable nature of recyclate at this juncture. At the present time a tonne of post-consumer mixed plastic waste or recyclate has a market value of £50-£100 and if this plastic were packaging waste the associated ‘packaging waste recovery note’ (PRN\(^\text{11}\)) could be worth as much as £200. This trend to commodify waste is global. Increasingly, recyclate is being traded as a global resource in much the same way as virgin raw materials.

Furthermore, the means of managing waste have become increasingly commodified, both at the level of global waste management corporations, and at the level of the household and its occupants. The waste business has shifted its focus significantly in

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\(^{10}\) Waste management policy has a long standing focus on materials recycling, however, some life cycle analysis studies have highlighted that in some cases recycling is not always the best environmental option. This issue will be returned to later in the thesis.

\(^{11}\) See Chapter 3
the past twenty years, from regionally based disposal companies to global corporations, who have the political and financial power to determine national and international waste strategies. The home has also become commodified as a site for waste management. For example, successful waste collection schemes often rely on the pre-sorting of refuse by householders. Equally, the home becomes a commodity for storing waste where alternate weekly collections are implemented for collecting different materials.

2.4.1.3 Local-global interrelations

Many studies in waste have looked primarily at management strategies at a regional or state level where waste is seen to be a problem only at the point of disposal. The aim here is to broaden these perspectives to look at the interconnectedness of waste management from a variety of scales.

State level influences clearly affect micro-scale waste management issues. For example, the German packaging ordinance means most Germans have more than one bin in their homes. However, micro-scale issues in waste management may also influence the broader political economy. A good example of householder influence over waste management issues is the move towards building more EfW facilities in Britain. As previously mentioned, many recycling schemes rely on pre-sorting waste by householders, yet if they are unwilling to participate in this unpaid activity the success of a recycling scheme could be jeopardised. Unwillingness to pre-sort waste has been experienced in Britain and this has contributed to the decision to promote EfW in Britain, because the need to pre-sort is bypassed. Equally, where EfW plants have been refused planning permission it has often been due to a few householders influencing the broader waste management agenda. Bearing in mind that domestic refuse is a non-point source problem (unlike many commercial and industrial wastes), local and micro-scale factors play a significant role in determining the outcome of management practices. It is clear that there is a significant range of relationships that exist between the disaggregated local scale (where waste is ‘produced’) and the aggregate regional and state scale where waste is managed.
2.5 Summary

This chapter has outlined the key developments in the thinking behind the political ecological approach and its potential as a theoretical framework in this study of household waste. Political ecology embraces a range of perspectives from geography and other disciplines, which means that it is not an approach which is "...set in concrete as an already formed structure of ideas. It is a discourse about nature...[which is]...subject to the fiercest of debates" (Peet and Watts, 1996:37).

While the theoretical content of political ecology continues to be debated, its use in the First World has been somewhat limited. Through the adoption of political ecological thinking as a framework for analysis, this thesis will not only analyse the local experiences and actions in relation to the management of household waste, but in so doing, it will attempt to demonstrate the applicability of political ecology to a First World issue such as waste management.

In such an analysis, the perspectives and actions of the householder will be situated centrally within the multi-levelled contexts of waste management policy (at local, regional, national and international levels), and the study of these complex relationships will help to provide a better understanding of the decisions and outcomes of waste management strategies. The task of the next chapter is to provide the broader political, economic and social waste management context in which the householder is situated.
3. Domestic Waste Management

While Chapter 2 outlined the theoretical approach that will underpin the analysis of waste management in Cleveland, this chapter will take a more detailed look at the history and development of domestic waste management strategies at a range of levels, from the global situation to the level of the household.

3.1 Introduction

Until the 1970s, household waste was not seen to be particularly hazardous to the environment. The disposal of this waste was merely one of the tasks for local governments, who had autonomy over arranging for the collection and disposal of municipal solid waste (MSW)\textsuperscript{12}. However, recent increases in the volumes of household waste, mounting evidence of groundwater pollution from landfills, increasing public opposition to new incinerators and landfills, and pressure from the European Commission (EC), has meant that domestic waste management in Britain is an increasingly complex and politicised issue which evokes responses from householders, environmental groups, local authorities and national governments.

In order to introduce the concept of a political economy of household waste management in Britain, four main areas are discussed in this chapter. Firstly, the broader contexts which define waste management historically, across Europe and throughout the rest of the world are addressed as means of placing the British situation in a global context. Second, the sources of domestic waste are briefly described, emphasising the transformation of the 'value' items and materials possess (as something which has a purpose and function) to the concept of 'waste', and how such transformations influence the composition of MSW. Thirdly, the increasingly complex nature of waste policy is discussed, and its influence on the types of management techniques which are employed. Finally, management techniques themselves are discussed, with particular emphasis being placed on energy from waste (EfW).

\textsuperscript{12} In this thesis, MSW and household waste refer to the same waste stream, that of post-consumer waste generated from the household unit.
Before discussing these issues further, it may be useful to briefly provide some definitions of waste management. Table 3.1 below gives brief definitions of key terms used in the discussion. While some issues (e.g. source reduction and re-use) are marginal to the focus of the discussion, they are defined below for purposes of clarity.

Table 3.1 Explanation of key terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source reduction</td>
<td>Essentially avoiding the production of waste in the first place refers to avoiding the situation whereby waste arises, this usually means minimising the use of materials which end their lives as waste.</td>
</tr>
<tr>
<td>Re-use</td>
<td>This is when products (usually items of packaging) are manufactured using more durable materials so that they can be returned to producers to be re-filled.</td>
</tr>
<tr>
<td>Landfill</td>
<td>This is the means by which waste is buried and in the ground.</td>
</tr>
<tr>
<td>Recovery</td>
<td>The universal term used here to describe waste management technologies which recover value from waste. Recovery can include composting where organic material is digested aerobically or anaerobically to produce a medium to improve soil. However, for the purpose of this thesis recovery is taken to mean recycling and EfW.</td>
</tr>
<tr>
<td>Recycling</td>
<td>Involves the recovery of materials from waste which are then reprocessed into new products (see Figure 3.5).</td>
</tr>
<tr>
<td>Energy from waste</td>
<td>The recovery of calorific value from waste through incineration at high temperatures. This energy is usually converted to electricity (see Figure 3.6).</td>
</tr>
</tbody>
</table>

While the actual processes of recycling and EfW occur at specific locations, the management strategies to collect, sort, and deliver waste for these means of recovery involves many more sites and resources. In this thesis recycling refers to the whole process of pre-sorting, collection, sorting, cleaning and reprocessing, while EfW also refers to the processes of collection and incineration which are required to recover the calorific value from waste in this way. Constituent parts of these processes are referred to by name, such as collection for recycling, reprocessing, or incineration.
3.2 The global problem of waste

As Chapter 2 demonstrated, the problem of waste is coming to be viewed as an increasingly critical environmental and social problem, not only at a local and national level, but also on a global scale. However, there are wide variations between countries in both the sources of waste, and the methods and practices employed to mitigate the problem. Table 3.2 illustrates the amounts of household waste arising in different countries. It is quite clear that more economically developed countries produce greater quantities of waste than developing countries (e.g. Egypt, Nigeria, India).

Table 3.2 Amounts of household waste in different countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Amounts (1,000 tonnes)</th>
<th>Amounts per capita (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>140,000</td>
<td>208,760</td>
</tr>
<tr>
<td>Japan</td>
<td>38,074</td>
<td>48,283</td>
</tr>
<tr>
<td>West Germany</td>
<td>20,423</td>
<td>19,483</td>
</tr>
<tr>
<td>Italy</td>
<td>14,095</td>
<td>17,300</td>
</tr>
<tr>
<td>France</td>
<td>12,000</td>
<td>17,000</td>
</tr>
<tr>
<td>Spain</td>
<td>8,028</td>
<td>12,546</td>
</tr>
<tr>
<td>Belgium</td>
<td>2,009</td>
<td>3,470</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1,900</td>
<td>2,850</td>
</tr>
<tr>
<td>England &amp; Wales</td>
<td>16,000</td>
<td>18,000</td>
</tr>
<tr>
<td>North America</td>
<td>151,000</td>
<td>225,000</td>
</tr>
<tr>
<td>OECD Europe</td>
<td>104,000</td>
<td>136,000</td>
</tr>
<tr>
<td>EC</td>
<td>86,000</td>
<td>104,000</td>
</tr>
<tr>
<td>OECD</td>
<td>302,000</td>
<td>423,000</td>
</tr>
<tr>
<td>Egypt*</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Nigeria*</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>India*</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Curzio et al. (1994:19) & *Gourlay (1992:33)

The USA has 44%, Japan 12%, Germany 7% and Britain 5% of total waste created in developed nations, in many ways reflecting the relative wealth of these nations. The wider international trend of increasing waste generation in developed nations, is especially an issue within the European Commission, where the level of MSW produced among member states increased from 280kg per capita to 350kg per capita between 1975 and 1990 MSW (Arango, 1994:27). Clearly, the overall quantity of household
waste produced in the developed world is increasing, as is the amount produced per capita, whereas in the developing world the amount of household waste produced per capita is much less.

While there is a trend of increasing waste production in the developed world, the quantities of MSW arising in different countries is not uniform, and these variations are often a result of different cultural factors. For example, the USA produces more than twice as much household waste per capita as France, which Curzio (1994:23) suggests could be a consequence of the following cultural differences:

1. average US dwellings are twice the size as those in France;
2. approximately 2% of USA waste is telephone directories, the French use Minitel;
3. fast food in USA is self service and served in disposable packages, in France food usually is bought at a café or patisserie where re-use is the norm;
4. on average one third more packaging is used in USA than in France.

As a further example, Britain produces more waste per capita than France but less than the USA. This may be a reflection of the fact that Britain has adopted many cultural aspects of North American lifestyles, while also maintaining a European identity.

3.2.1.1 International trends in waste management

International trends in waste management parallel many of the changes which have occurred in Britain and Europe. In most First World countries, there has been a shift from landfill, with more emphasis placed on recycling and EfW, where landfill is still employed it is managed more carefully than it has been in the past.

The waste management situation in the USA since the 1970s typifies this trend of shifting emphasis from landfill toward recovery. As a consequence of the USA’s shift from landfill to recycling and EfW, the amount of waste being incinerated increased tenfold from 2 - 15% throughout the 1980s (Curzio, 1994:15). Recycling and composting also increased during the same period, which had the overall effect of reducing the amount of MSW being disposed in landfills from 83% to 67% in the
decade between 1980 and 1990 (US Environmental Protection Agency, 1992). The USA’s Environment Protection Agency (EPA) believe that this trend will continue, and they expect recovery rates to double by 2000 when only 49% of household waste will be landfilled (US EPA, 1992).

These changes also occurred in Europe, with more emphasis being placed on recycling rather than EfW, but as in America, waste was diverted from landfill. In the decade between 1980 and 1990, Britain’s waste recovery performance was poor in contrast to America and other parts of Europe, only marginally reducing the amount of waste going to landfill. This was primarily due to the lack of regulation, and the availability of cheap landfill sites, owing to suitable geology.

Although Britain performed relatively poorly in contrast to other parts of Europe, it did manage to increase recycling rates between 1980 and 1990. Particular success was found with paper and glass recycling, which increased to 40% and 30% respectively by 1991. In general, the developed world is utilising recycling more than EfW technologies as the preferred means of recovering value from waste (OECD, 1991).

3.2.1.2 International trends in EfW

It will become evident from the later discussion that Britain has a long history of using incineration to deal with domestic refuse\textsuperscript{13}. However, its current use of incineration and particularly modern energy from waste facilities trails behind many other countries. Japan, Switzerland, France, Germany, Sweden and the Netherlands rely heavily on waste incineration, and many employ modern EfW facilities to recover heat and electricity from waste. Table 3.3 summarises the status of EfW throughout Europe.

\textsuperscript{13} A more detailed history of Britain’s experience of waste incineration is included in Appendix **
Table 3.3 European EfW facilities

<table>
<thead>
<tr>
<th>Country</th>
<th>% waste incinerated</th>
<th>Country</th>
<th>% waste incinerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland</td>
<td>80</td>
<td>Germany</td>
<td>30</td>
</tr>
<tr>
<td>Japan</td>
<td>73</td>
<td>Denmark</td>
<td>23</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>69</td>
<td>Norway</td>
<td>20</td>
</tr>
<tr>
<td>Sweden</td>
<td>53</td>
<td>United States</td>
<td>17</td>
</tr>
<tr>
<td>France</td>
<td>41</td>
<td>Italy</td>
<td>16</td>
</tr>
<tr>
<td>Netherlands</td>
<td>37</td>
<td>United Kingdom</td>
<td>13</td>
</tr>
</tbody>
</table>

Source: Curzio et al. (1994:17)

There are currently 500 incinerators in Europe, of which 80% recover energy, EfW is the dominant waste management method in Sweden, Denmark, Luxembourg and Switzerland. The use of EfW is much further advanced in Europe than in Britain, and it appears to be viewed more favourably, especially since a number of facilities are built in town centres and major residential areas. Town centre EfW facilities have been built in Malmö, Sweden, and the modern Saint Ouen plant in Paris is a local attraction, since it was designed by a popular architect (Groupe Esys-Montenay, 1994). Despite the extensive usage of EfW as a recovery option throughout Europe, it is increasingly being realised that a more integrated approach is required to tackle waste issues where EfW forms a component of waste management strategy (see section 3.6.6).

3.3 Household waste in Britain

There are over 23 million households in Britain (OPCS, 1993), and each one produces approximately one tonne of waste each year. Although this is a significant amount of waste, it constitutes only 5% of total waste created in Britain as shown in Figure 3.1. This section examines the types of waste produced, where it arises and how the amounts produced fluctuate over time. Determining these factors is important because people influence the composition of waste, where it is produced and how it arises and these factors in turn influence and help define waste management strategies.
Chapter 3: Domestic Waste Management

Figure 3.1 Estimated total annual waste arising in Britain by sector

Source: Department of the Environment (1997)

3.3.1 The spatial differentiation of waste

The types and quantities of refuse produced in different regions of Britain vary substantially. Research by M.E.L (1994) investigated the quantities and composition of household refuse in the West Midlands using samples of household waste taken from census enumeration districts in Coventry, Birmingham and Wolverhampton. Their findings showed that “...households in Coventry generated the smallest quantities of waste (11.6kg), compared with 12.9kg in Birmingham and 16.6kg in Wolverhampton” (MEL, 1994:11). In addition to these regional variations in the quantity of waste arising, there are also regional compositional variations in MSW, Table 3.4 illustrates some of these variations.
3.3.1 The spatial differentiation of waste

The types and quantities of refuse produced in different regions of Britain vary substantially. Research by M.E.L (1994) investigated the quantities and composition of household refuse in the West Midlands using samples of household waste taken from census enumeration districts in Coventry, Birmingham and Wolverhampton. Their findings showed that "...households in Coventry generated the smallest quantities of waste (11.6kg), compared with 12.9kg in Birmingham and 16.6kg in Wolverhampton" (MEL, 1994:11). In addition to these regional variations in the quantity of waste arising, there are also regional compositional variations in MSW, Table 3.4 illustrates some of these variations.
Table 3.4 Regional variations in MSW in Britain (% of weight)

<table>
<thead>
<tr>
<th>Region</th>
<th>Screenings &lt; 20mm</th>
<th>Vegetables &amp; putrescibles</th>
<th>Paper</th>
<th>Metals</th>
<th>Textiles</th>
<th>Glass</th>
<th>Plastics</th>
<th>Unclassified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleveland</td>
<td>6.4</td>
<td>31.9</td>
<td>34.5</td>
<td>4.3</td>
<td>3.9</td>
<td>6.5</td>
<td>8.6</td>
<td>3.9</td>
</tr>
<tr>
<td>Isle of Wight</td>
<td>10.0</td>
<td>10.0</td>
<td>35.0</td>
<td>9.0</td>
<td>3.0</td>
<td>6.0</td>
<td>16.0</td>
<td>11.0</td>
</tr>
<tr>
<td>Dundee</td>
<td>12.9</td>
<td>18.3</td>
<td>26.9</td>
<td>6.1</td>
<td>3.5</td>
<td>9.8</td>
<td>15.7</td>
<td>6.9</td>
</tr>
<tr>
<td>Birmingham*</td>
<td>4.1</td>
<td>27.5</td>
<td>27.2</td>
<td>6.1</td>
<td>2.7</td>
<td>6.9</td>
<td>9.8</td>
<td>15.7</td>
</tr>
<tr>
<td>Coventry*</td>
<td>2.8</td>
<td>27.3</td>
<td>30.6</td>
<td>6.3</td>
<td>2.2</td>
<td>7.3</td>
<td>10.8</td>
<td>12.7</td>
</tr>
<tr>
<td>London#</td>
<td>10.4</td>
<td>18.8</td>
<td>33.7</td>
<td>8.0</td>
<td>4.7</td>
<td>6.7</td>
<td>8.1</td>
<td>9.6</td>
</tr>
<tr>
<td>Newcastle#</td>
<td>10.5</td>
<td>18.6</td>
<td>34.3</td>
<td>6.7</td>
<td>4.2</td>
<td>8.4</td>
<td>6.8</td>
<td>10.5</td>
</tr>
<tr>
<td>Portsmouth#</td>
<td>8.1</td>
<td>20.2</td>
<td>38.0</td>
<td>6.5</td>
<td>3.3</td>
<td>5.8</td>
<td>8.8</td>
<td>9.2</td>
</tr>
<tr>
<td>Southampton#</td>
<td>5.6</td>
<td>22.0</td>
<td>33.1</td>
<td>8.3</td>
<td>2.4</td>
<td>8.7</td>
<td>9.7</td>
<td>10.3</td>
</tr>
<tr>
<td>Doncaster#</td>
<td>19.3</td>
<td>17.7</td>
<td>24.5</td>
<td>9.3</td>
<td>3.5</td>
<td>8.0</td>
<td>7.4</td>
<td>10.3</td>
</tr>
<tr>
<td>UK range</td>
<td>4.1-19.3</td>
<td>10.0-27.5</td>
<td>24.5-38</td>
<td>4.3-9.3</td>
<td>2.2-4.7</td>
<td>5.8-9.8</td>
<td>6.8-16.0</td>
<td>3.9-15.7</td>
</tr>
</tbody>
</table>


3.3.2 The social stratification of waste

While the types and quantities of domestic waste vary between different regions, there is also evidence to show that variations in the composition of waste between individual homes is linked to socio-economic status. The National Household Waste Analysis Project (NHWAP), which collected waste samples from five local authorities around Britain between 1992 and 1993, observed that more affluent people produce more waste, particularly paper, board, plastics, and glass. The most significant socio-economic variance in waste generation is paper, because the most affluent householders produce approximately two and a half times more paper than some of the least affluent (ACORN category F) households.

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14 Putrescible is the collective term used to describe organic wastes which decompose, however, organic garden waste is sometimes classified separately.

15 Here 'affluent' households include those in the ACORN classifications of J and F. ACORN being a standard socio-economic classification of household types which are based on census data (Department of the Environment, 1994a).
3.3.3 Seasonal fluctuation in waste generation

In any one household, there are noticeable changes in the amount of waste produced over the year. Figure 3.2 illustrates the changes in waste arisings from an affluent home from October 1991 to December 1992 (Department of the Environment, 1994a). It is clear from this figure that waste arisings vary substantially over the period of a year, peaks in waste output are found around Christmas, New Year, Easter, and possibly other celebrations, such as birthdays.

*Figure 3.2 Variations in the waste arisings for an affluent home in St. Albans during 1991/92*

![Graph showing seasonal waste generation]

Source: adapted from Department of the Environment (1994a:24).

3.3.4 Longer term changes in waste generation

While the amount of waste generated changes considerably over the course of a year, the types of materials arising in household waste has changed relatively little over the last century (the obvious exception is plastic). Although the types of waste materials have not changed significantly, the proportions of these materials in domestic waste have changed considerably. Figure 3.3 shows the general trends of these changes since 1879.
Figure 3.3 illustrates that in 1879 almost 80% of domestic waste consisted of dust and cinders. This high proportion was due to the fact that almost every house had an open fire which burned coal, wood or a similar fuel. Additionally, in many households, combustible waste such as paper and food remains were also burned – leaving the home as dust and cinders. The decline of cinders and ash in refuse began after the 1956 Clean Air Act was passed, since this required the use of smokeless fuels, leading to the reduction in the number of open fires\(^{16}\). Of significance today are the increases in the proportions of paper & board, textiles, and plastics. These are important here because they make up the portion of refuse with a high calorific value, and this has clear implications for EfW.

It is of interest to note that the increases of paper and board, metals, and glass have all been slight (glass has in fact declined) between 1981 and 1992. These slight increases could be due to the counteracting effect of increased recycling. Despite the fact that Rathje and Murphy (1992) have attributed similar trends in the USA to recycling, this is only likely to be part of the reason for this decline because Britain’s level of household...
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waste recycling remains low. A more plausible explanation for this change is the decrease in the quantity of materials needed to make equivalent products. For example, five times less metal is needed to produce a drinks can today than in 1950. Equally, there has been a shift in the types of materials used for the manufacture of goods, most noticeably plastics, which are increasingly used as substitutes for glass, paper and metal.

3.3.5 Packaging - the controversial and conspicuous ‘third’

Although it is interesting to analyse household refuse in terms of its material composition, it does not inform what function the material served before it became waste. Over a third, by weight, of household waste is post-consumer packaging (Department of the Environment & the Welsh Office, 1995). This proportion is reflected across the rest of the developed world, and Curzio et al. (1994:2) estimate that one third of MSW in OECD countries also consists of used packaging. Packaging is used to fulfil the following functions:

- protection and preservation of products;
- promotion and identification of products;
- reduction in the quantity of domestic putrescible waste arising;
- keeping products clean, fresh and safe from contaminants; and
- promotion of products.

Packaging waste became an emotive issue a number of decades ago, with environmentalists campaigning for more reusable containers and increased recycling facilities in the seventies. Long after their initial “Bring Back the Bring Back” campaign in 1971, Friends of the Earth continue to criticise packaging waste in publications such as Don’t Throw it all Away (1992a), and Bring Back the Bring Back (1992b). Friends of the Earth make their position clear in Overpackaging wasting.

While this reduction in home waste incineration would lead to a reduction in the ash component of domestic refuse, it must also be noted that the ash content of smokeless fuels is less than most coals.
money, wasting resources (1993) when they state that excess packaging is causing "... global degradation and adding prices to the householders shopping list".

Post-consumer packaging has attracted a great deal of attention for a number of reasons:

- it has more potential for recovery than some other wastes;
- the amount discarded is increasing;
- it is seen and handled by householders every day;
- there is a large amount of it (in Britain 18,000 tonnes arises each day);
- it is bulky; and
- it is a conspicuous reminder of the 'throw-away' culture of industrial economies.

The high waste levels and the conspicuous nature of post-use packaging has resulted in the introduction of legislation to divert waste, particularly packaging waste, from landfill and promoting waste reduction, reuse and recovery.

3.4 Legislation affecting British waste management

Having examined the significance and composition of domestic waste, it is appropriate to now consider the impacts that different environmental legislation has had on British waste management. The past few decades have seen a transformation of waste management in Britain through the implementation of legislation, ranging from anti-pollution laws, general environmental protection, through to specific waste legislation. This legislation has been implemented by the Department of the Environment Transport and the Regions (DETR) and its earlier incarnations, and policed by regional Environment Agency (EA) offices or earlier bodies such as WRA, HMIP and the NRA. Although these organisational changes occurred during the period of this research, their current names and organisation are referred to throughout this thesis.

17 The EA formed in 1996 from an amalgamation of the three pollution control agencies responsible for the contamination of land (Waste Regulation Authorities - WRA), water (National Rivers Authority - NRA), and air
By way of illustrating the breadth of legislative tools which steer waste management practice and policy, key enactments are summarised in Table 3.5 below. These tools are discussed in more detail in the relevant sections in the remainder of this chapter.

Table 3.5: Summary of key legislation and publications steering waste management

<table>
<thead>
<tr>
<th>Name</th>
<th>Main feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control of Pollution Act (1974)</td>
<td>Introduces formal responsibility for waste management.</td>
</tr>
<tr>
<td>Environmental Protection Act (1990)</td>
<td>Formation of LAWDCs(^{18}), Integrated Pollution Control, Proximity &amp; Polluter Pays Principals.</td>
</tr>
<tr>
<td>Waste management hierarchy (1991)</td>
<td>Best principles for waste management</td>
</tr>
<tr>
<td>Local authority set ‘aspirational’ recycling targets (1990)</td>
<td>‘Aspirational’ target to recycle 25% of household waste by 2000 &amp; recover 40% by 2005</td>
</tr>
<tr>
<td>Non Fossil Fuel Obligation (1989)</td>
<td>Preferential access to the electricity market for renewable generators (includes EfW)</td>
</tr>
<tr>
<td>Landfill Tax (1997)</td>
<td>Tax (£7 rising to £10) on household waste being landfilled</td>
</tr>
<tr>
<td>Producer Responsibility Obligations (Packaging Waste) Regulations (1997)(^{19})</td>
<td>Obligation on producers of packaging waste to recover a percentage of packaging materials produced</td>
</tr>
<tr>
<td>Statutory Guidance on Accreditation of Reprocessors (1997)</td>
<td>Enables waste reprocessors to provide proof of compliance for producers with obligations under the packaging regulations</td>
</tr>
<tr>
<td>Landfill Directive (expected 1999)</td>
<td>Pre-treatment of 65% biodegradable waste being landfilled by 2020</td>
</tr>
</tbody>
</table>

\(^{18}\) Local Authority Waste Disposal Companies

\(^{19}\) Here on in these Regulations will be referred to as the ‘packaging regulations’
3.4.1 Control of Pollution Act (COPA), 1974

The COPA requires only brief attention here because all its functions relating to waste management have been superseded by the Environmental Protection Act (EPA), 1990. However, the COPA was important because it set a precedent by classifying household waste as a ‘controlled waste’, and thus introduced a degree of responsibility for waste and its management. Previously, household waste had been viewed as an inconvenience, requiring cheap and convenient disposal. However, the formality required by the COPA meant that planning strategies had to incorporate provisions for waste management. As a consequence, large urban local authorities were required to produce ten year waste disposal plans to outline their management options. Prior to the COPA, waste disposal was largely unregulated, so the COPA introduced a licensing system for waste sites which brought a degree of control and accountability to waste management.

3.4.2 Environmental Protection Act, 1990

Passed in 1990, the EPA comprises of two parts. Part II is of most relevance here because it replaced and added to the functions of the COPA. The EPA is a far reaching policy based on the principle of Integrated Pollution Control for managing materials which have the potential to be hazardous to the environment. Integrated Pollution Control requires that all environmental media (air, water and land) are protected through the imposition of “a new duty of care on persons concerned with controlled waste” (Department of the Environment et al., 1993:1)\textsuperscript{20}.

Part II of the EPA requires that managers of controlled waste implement better practices, and these are enforced through waste management licences (cf. disposal licences with the COPA) which place greater responsibility on disposal, pollution abatement, and post-disposal management. A major flaw with the COPA, which caused problems for local authorities, was the concept of ‘after care’ of a waste site once its commercial viability had ceased. The COPA did not require site owners to put provisions in place for the management of waste sites once operations had ceased, so

---

\textsuperscript{20} The EPA defines controlled wastes as those comprising household, industrial and commercial waste, however, much of this classification is dependent on the source of the waste, and whether it is excluded from definitions of special or hazardous wastes (Petts and Eduljee, 1994). Approximately 40% of Britain’s wastes are classified as controlled.
this meant that waste management companies could hand their disposal licences back to the local authority at any time. Once the local authority had received this licence all legal responsibilities for the management of a disposal site were transferred back to the authority. This has had serious implications for local authorities who have inherited badly managed waste sites which demand expensive ‘after care’ in order to prevent potential environmental damage\(^\text{21}\). This problem has been rectified with the EPA through the introduction of ‘civil liability’ which requires that licences can be surrendered only if the relevant authority (at present the Environment Agency) accepts the licence. Until this occurs, the licence holder remains responsible for the disposal site until the threat of environmental damage has passed.

The EPA is designed to transpose guidelines for waste management set out in two Directives which were enacted in 1975 and in 1991. These Directives require that the following principles are followed when developing strategies for managing waste:

- prioritise the minimisation, recycling and recovery of waste;
- adhere to the Best Possible Environmental Option (BPEO) in waste disposal (BPEO is restrained by BATNEEC which requires that management uses the Best Available Technology Not Entailing Excessive Cost);
- conform to the Proximity Principle (PP) which requires waste to be disposed as close as possible to source\(^\text{22}\); and
- enforcement of the Polluter Pays Principle (PPP), which demands that the producers of waste pay for its management (OECD, 1975).

\(^{21}\) Landfills can pose particular problems, for example, a methane explosion at Loscoe, Derbyshire in 1986, resulted after methane had migrated into homes which were sited on an old landfill site, this caused an explosion which demolished several houses. This accident was due largely to the failure of the landfill managers to properly control methane discharges.

\(^{22}\) While the PP applies to waste disposal the EC encourages the free movement of waste for recycling. Whether waste to be incinerated with energy recovery should be permitted to move freely, or whether the PP should apply is currently under review in the EC.
3.5 Privatising waste management

Public investment in waste management was central to disposal strategies from the late nineteenth century until the 1970s because it was perceived that the private sector could not carry out such tasks in a cost effective and safe manner (Gandy, 1994). Since the election of the Conservatives in 1979 there has been a substantial shift from the Keynesian model of public expenditure, towards a laissez-faire approach, which has seen the extension of market forces (Gandy, 1994; Hutton, 1995).

The EPA requires that local Waste Disposal Authorities (WDAs) transfer their waste disposal operations to ‘arms-length’ local authority waste disposal companies (LAWDCs), or tender waste disposal operations to a private waste management company (WMC). To ensure that waste disposal operations transfer from the local authority to the private sector or an ‘arms-length’ LAWDC in a fair manner, local authorities must offer the disposal contract via compulsory competitive tendering (CCT). This process prevents local authorities automatically transferring a waste disposal contract to a LAWDC because private WMCs are invited to bid for the contract alongside a LAWDC.

Where a LAWDC does not exist, such as in Cleveland23, a number of WMCs are invited to bid for the waste disposal contract. Under these circumstances, a local authority may want to form a joint venture company (JVC) with a private waste operator. The main difference between a LAWDC and a JVC is that with the former the WDA operates and manages waste disposal, whereas JVCs usually require all assets to be transferred to the WMC managing the waste disposal operations. Responsibility for waste collection remains with the local authority under the remit of the Waste Collection Authorities, but authorities can also tender these contracts to WMCs, many of which specialise in waste collection.

23 The timing of the EPA meant that CCC forms a temporary LAWDC, but this organisation did not bid for the management contract.
3.5.1 Waste Management Companies

Private waste management companies have traditionally been small, family run businesses. However, increasing operational costs, coupled with the increasing profitability of these businesses, means that British WMCs are currently in a period of consolidation similar to that which has already occurred in the USA (Gandy, 1994:13; and Crooks, 1993). For example, Northumbrian Environmental Management (NEM) operates numerous waste management companies and is a daughter company to Northumbrian Water, which itself is owned by a French utility company called Lyonnaise des Eaux, which has further international waste management concerns. Another example is Waste Management International, the world’s largest waste management company, which owns UK Waste and has major operations in the USA, Canada, Europe and other parts of the world. Similar to Northumbrian Water’s ownership of Northumbrian Environmental Management, South West Water owns Haul Waste and recently purchased Terry Adams, which was the largest family owned WMC in the Southwest of Britain. These acquisitions mean that many WMCs have a great deal of capital, expertise, and financial underwriting potential at their disposal. Consequently, the potential for operating projects with large capital investments, such as EfW facilities, is much greater than with smaller, family owned businesses.

3.6 The waste hierarchy

The EC’s Community Strategy for Waste Management (1991) forms the cornerstone of planning disposal strategies in Britain, this strategy is founded on a hierarchy for the best means of managing waste (DTI, 1995a). This hierarchy has been adopted by Britain in its national waste strategy: Making waste work (1995)\(^\text{24}\). However, Britain’s hierarchy differs from the EC hierarchy because EfW and recycling are stated as equal recovery options, whereas the EC hierarchy places recycling above EfW in the hierarchy. At the time this caused many advocates of recycling (who also dislike EfW) to protest about this adoption of the EC hierarchy. This issue of how to situate EfW and

\(^{24}\) At the time of writing this strategy is being reviewed in the consultation paper Less waste more value. Responses to this consultation exercise will not be published in time for inclusion here, therefore, this review is not discussed in this thesis.
recycling remains a contentious issue and it is discussed later in this chapter. The current waste hierarchy is summarised in Figure 3.4 and some of the methods of waste management involved in the hierarchy are discussed in more detail below.

Figure 3.4: The waste hierarchy

3.6.1 Reduction

Little needs to be said of source reduction at this stage, other than to highlight the observation made by Rathje and Murphy (1992:214) that:

"Source reduction is to garbage what preventative medicine is to health - a means of avoiding trouble before it happens."

The packaging industry and packaging waste has been an area targeted for source reduction for some time. Although the industry has managed to achieve important reductions in the sources of waste (see Table 3.6), the packaging regulations have been introduced to further promote source reduction. It is easy to assume that the packaging regulations are solely concerned with placing obligations on producers to recover value from packaging manufactured, yet source reduction is also implied in these regulations. The basis of the packaging regulations is on the weight of packaging produced, therefore, reducing the weight of packaging at source means that less needs to be recovered.
Table 3.6 Reductions in the weight of equal volume packaging items

<table>
<thead>
<tr>
<th>Weight of common packaging items (grams)</th>
<th>1950s</th>
<th>1960s</th>
<th>1970s</th>
<th>1980s</th>
<th>1990s</th>
<th>Overall change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk bottle</td>
<td>538</td>
<td>397</td>
<td>340</td>
<td>245</td>
<td>245</td>
<td>-293</td>
</tr>
<tr>
<td>Food cans</td>
<td>69</td>
<td>69</td>
<td>69</td>
<td>58</td>
<td>57</td>
<td>-12</td>
</tr>
<tr>
<td>Yoghurt pot</td>
<td>N/A</td>
<td>12</td>
<td>9</td>
<td>7</td>
<td>5</td>
<td>-7</td>
</tr>
<tr>
<td>Drinks cans</td>
<td>91</td>
<td>91</td>
<td>91</td>
<td>20</td>
<td>17</td>
<td>-74</td>
</tr>
<tr>
<td>Plastic bottle</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>66</td>
<td>42</td>
<td>-24</td>
</tr>
<tr>
<td>Jam Jar</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>160</td>
<td>-20</td>
</tr>
</tbody>
</table>

Source: Biffa, (1993)

3.6.2 Reuse

Although the amount of reusable packaging declined significantly after the 1960s, there has been a recent trend, albeit slight, towards adopting reusable packages. Much of this reuse, however, is in commercial and industrial packaging, where sturdier crates and boxes are required, these can also be easily returned to be refilled on ‘back-filled’ wagons. Having said this, some consumer packaging is aimed at being reused, but not necessarily in the understood sense of returning the packaging to the producer for refilling (e.g. a milk bottle). Contemporary reusable packaging places the further responsibility for reuse on the consumer, thus detergent bottles and boxes can be reused, and many retailers ask customers to reuse carrier bags.

3.6.3 Recycling

While reuse is concerned with using a product again for the same or a similar purpose, recycling involves reprocessing disused products to manufacture a ‘new’, or recycled product which may, or may not be used for the same purpose as the original item. Recycling involves a number of processes and these are summarised in Figure 3.5.
Recycling post-consumer waste is usually more difficult and expensive than industrial recycling. This is mainly because materials in household waste are mixed and the waste is geographically dispersed. For example, the logistics and economics of recycling cardboard boxes from 3-400 large retail stores is more viable than collecting similar, but much smaller amounts of material from a mixed waste stream produced at 23 million locations (households).

A further problem with domestic waste recycling is highlighted in Figure 3.5, in that most domestic recycling schemes require the input of labour from householders. This participation is essential in many recycling schemes because an important element of pre-sorting occurs, whereby the most valuable components of a waste stream are set aside by the householder. Pre-sorting is beneficial, and often vital, for recycling schemes, because it increases the value of the waste material, while reducing the operating costs of the MRF (because less capital and labour is required to sort the collected materials).

These difficulties with recycling domestic waste are reflected in the fact that only 5% of household packaging waste is recycled compared with 28% of commercial and industrial packaging (DETR, 1998). In addition to these difficulties, some of the environmental benefits gained from recycling are questionable (Fairlie, 1992). As many LCA studies have highlighted, waste destined for reprocessing does not have to be
transported many miles before the environmental costs of this transport outweigh any benefits associated with recycling.

Despite these problems, there is a broad consensus that recycling is a useful, if not the best, means of recovering value from waste and a number of tools have been introduced since the EPA to stimulate domestic waste recycling. These are summarised below:

- local authorities have been set ‘aspirational’ targets to recycle 25% of domestic waste by 2000;
- the landfill tax aims to deter waste from being landfilled;
- the packaging regulations incorporate minimum statutory recycling targets; and
- recycling credits have been introduced to encourage recycling\(^{25}\).

Most householders will only see local recycling activities yet many recycling activities take place on an international scale. Unlike waste, materials recovered from the waste stream for recycling can be freely traded on the global market, and this world trade has implications for the management of wastes at a local and regional level in two main ways. Firstly, materials recovered from waste in the developed world have to compete with materials recovered from waste in other parts of the world. Secondly, recovered materials have to compete with virgin feedstock. For example, the price paid to Britain’s local authorities for recovered plastic is affected by the global price of prime polymers (virgin plastic). Curzio \textit{et al.} (1994) summarise the impact of some global factors which influence recycling:

"...an over supply of virgin materials, brought on by technological innovation at the level of economic systems, and the resulting downward trend in international commodity prices that occurred over the last decade, has surely contributed to freezing the popular expectation of the late '70s whereby waste was the 'resource of the future' and most likely has had the effect of discouraging a more widespread implementation of [recovery technologies]" (Curzio \textit{et al.}, 1994:4-5).

\(^{25}\) Waste Disposal Authorities pay authorities and their representatives when waste is diverted from landfill for recycling. WDAs fund these credits from the money saved from the landfill gate fee.
3.6.4 Energy from waste

The benefits of EfW as a means of recovering value from household waste, whilst also diverting waste from landfill, are becoming more widely appreciated. The modern EfW process is summarised in Figure 3.6 below.

Most modern EfW facilities operate on a mass burn basis. Waste arrives at the plant and is tipped in the waste pit which can store 3,500 tonnes. It is then lifted by overhead cranes into hoppers which continuously feed the two incinerators, which each burn 20 tonnes of waste per hour. The incinerators heat water in the boiler to 400°C and the resultant steam powers a turbine which generates electricity. Bottom ash falls through the grates of the incinerators and passes beneath a magnet which removes the ferrous metals, which are baled and sent for reprocessing. The gases resulting from combustion are treated with lime and activated carbon to neutralise the acid, these gases then pass through bag filters which remove large particulates, called fly ash. The bottom and fly ash are then landfilled, although bottom ash is beginning to be used as a substitute aggregate in the construction industry. The mass burn EfW process results in the production of electricity (here 20MW from 250,000 tonnes per annum) while reducing the volume of waste by 80-90%, and the weight by 65-75%.

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26 The process described here is similar for all mass burn EfW facilities, but the figures quoted refer to the EfW facility at Cleveland.
Energy from waste plants have a number of advantages over other recovery methods, particularly recycling. EfW plants are usually located near to urban areas, thus the transportation of waste is minimised. Furthermore, none of the sorting, cleaning and processing activities illustrated in Figure 3.5 are required, so all household waste can be processed with one facility, and contaminated wastes can be made safe through high temperature incineration. These factors, combined with the broad political support which EfW receives (see below), make energy from waste an attractive solution for waste recovery, and as a key component for a regional waste strategy. Despite the advantages of the EfW process, opposition to EfW facilities remains because environmentalists and many of the public are suspicious of incinerators, and often the facts about EfW are misunderstood (DTI, 1995a:34; MRW, 27.03.1998; and Petts, 1992 and 1995).

There have been many concerns about the possible pollution produced by EfW plants and specific concern over dioxins has been a major impetus behind EC legislation on incinerator emissions (see Appendix A). Some incinerators operating in 1996 discharged 45 times more dioxin than new EfW plants, and the Royal Commission on Environmental Pollution (1993) estimated that these incinerators were responsible for a fifth of all human-made dioxin emissions. However, in 1989 two EC directives were adopted which require new and existing waste incinerators to conform to much stricter emission standards. Britain implemented both of these Directives through the Municipal Waste Incineration Directions Order (1991).

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27 Many EfW plants incinerate local hospital waste, but some elements of household waste are hazardous (such as pharmaceutical products and paints) and benefit from being incinerated.

28 There are over 200 dioxins in the family of chlorinated organic compounds. Dioxins are ubiquitous in the environment and occur from both natural and artificial sources (Porteous, 1994b). The dioxin which has received the most attention and caused the most concern, is 2,3,7,8 TCDD. While it is an extremely toxic human-made substance it is also very rare. Despite the unproven risk from dioxins it is important to keep any emissions to a minimum because dioxins persist in the body, in a similar fashion to DDT (Gourlay, 1992).

29 The first directive (89/369/EEC) concerning new plant (constructed after 1990) aims to harmonise EC members' emission standards through BATNEEC. The requirements for emissions vary with the size of plant, and these differences are summarised in Appendix A. The second directive (89/429/EEC) covers plants built before 30 November 1990 and requires incinerators to either meet the emission standards for new plants by 1st December 1996, or close down. This resulted in almost all of the 30 incinerators operating in Britain closing down in November 1996 (Cosslett, 1996). See Appendix B for the current status.
Furthermore, a study by the National Renewable Energy Laboratory (1992) highlights the fact that other waste management techniques which do not have 80 metre high stacks also emit atmospheric pollutants. Table 3.7 which simplifies some of the data from this study, illustrates that EfW has comparable air emissions to other waste management techniques\textsuperscript{30}.

\begin{table}[h]
\centering
\begin{tabular}{|l|l|l|l|l|}
\hline
\textbf{Air Emissions} & \textbf{Landfill with gas recovery} & \textbf{EfW} & \textbf{Refuse Derived Fuel} & \textbf{Kerbside collection, landfill & composting} \\
\hline
Particulate & 4 & 3 & 2 & 1 \\
Carbon monoxide & 4 & 3 & 2 & 1 \\
Hydrocarbons & 3 & 3 & 3 & 1 \\
Nitrogen oxides & 4 & 2 & 3 & 1 \\
Methane & 1 & 4 & 3 & 2 \\
Carbon dioxide & 3 & 1 & 2 & 4 \\
Water & 3 & 1 & 2 & 4 \\
\textit{Sub total score} & 22 & 17 & 17 & 14 \\
Dioxin/furan & NA & 1 & 2 & NA \\
Sulphur dioxide & NA & 1 & 2 & NA \\
Hydrogen chloride & NA & 1 & 2 & NA \\
\textit{Total score} & 20 & 22 & & \\
\hline
\end{tabular}
\caption{Order-of-magnitude of air emissions for waste management strategies (1 = highest emissions)}
\end{table}

\[\text{[NA = Not Analysed]}\]

Adopted from the National Renewable Energy Laboratory, 1992

\textsuperscript{30} It should be noted that this study is used as a basic comparative tool and, for example, no credit has been given to EfW for emissions off-set from the fossil fuel it substitutes.
3.6.5 Disposal

Belief that household waste incineration through EfW is a disposal method, or that recycling stops waste, are mistaken. Complete disposal by incineration of some wastes is possible, and closed-loop recycling is possible for some processes. Domestic waste, however, is excluded from these types of management, and EfW and recycling rely, to some extent, on landfill. Incineration produces three, and sometimes four types of waste. These are bottom ash, fly ash, gaseous waste, and liquid waste (depending on plant design), all of which need to be landfilled. All post-consumer waste entering a recycling process will eventually need landfilling, regardless of whether it is recycled 5 times, or whether it is rejected immediately because of unsuitability (such as high concentration levels).

Yet, despite the nations intentions to recycle more waste and build more EfW facilities, landfill remains the most common form of disposal in Britain, and at present 90% of Britain’s household waste is directly landfilled. A proportion of the remaining 10% will eventually be landfilled after it has been reprocessed several times, or converted to ash through incineration. Landfill, therefore, is extremely important for British waste. However, the amount of waste landfilled in Britain will decrease in the coming years due to various legislative pressures. These are outlined in the following section.

3.6.5.1 Landfill tax

The landfill tax was introduced in October 1996 as an economic instrument to “encourage the pursuit of waste management options higher in the hierarchy, including incineration with energy recovery” (DoE, 1994b). The landfill tax, claimed to be Britain’s first “eco-tax” (Boulton, 1995; Schoon, 1995), is charged at two rates. Household waste falls in the higher tax bracket which is currently set at £7 per tonne, but will rise to £10 per tonne in 1999. A lower bracket of £2 per tonne is set for inert wastes which do not produce methane, such as construction waste, and this will not increase in 1999 (Cove and Meikle, 1995). Opponents of EfW, who believe the process inhibits recycling argue that EfW should be subject to a similar taxation. This was reviewed in the 1998 Budget but the proposals were not developed by the Chancellor (Brown, 1998).
Overall, the tax has been well received and there are signs that it is beginning to work. The tax has more immediate impact on EfW operators than on recycling schemes because to win waste disposal contracts EfW operators have to compete directly with landfill. Recycling, however, only accounts for a proportion of the waste stream and does not, therefore, compete directly with landfill. Opponents of the tax argue that the increased cost of disposal would put many of the smaller, rural landfill operators out of business and possibly encourage illegal waste disposal practices such as fly-tipping. Local authorities have also voiced a number of concerns, arguing that the extra costs associated with the landfill tax will mean that other waste management activities, such as recycling, will be curtailed (Northern Echo, 1995:7).

### 3.6.5.2 The Landfill Directive

A further development of the landfill tax which will stifle the amount of waste being landfilled is the pending EC Directive on landfilling, which is expected to come into force in 1999. In addition to other targets on materials such as waste tyres and hazardous waste, this Directive will require Britain to pre-treat the majority of its domestic waste which is currently directly landfilled. The Directive will also require the total amount of waste being landfilled to be reduced. It is likely that more EfW facilities and recycling activities will be required to meet the targets set under the Directive, although it is unlikely that a further “70 EfW plants at the cost of £5.6 billion” (Helm and Clover, 1996) will be necessary.

### 3.6.6 Integrated waste management (IWM)

What is often forgotten in discussions about the waste hierarchy is that it is not a prescriptive set of rules, nor does it limit the technologies that can be used for waste management. It is instead a guide to waste management, with management methods being informed by the principles of BPEO in addition to their place in the hierarchy. The hierarchy implies an integrated approach to waste management because it permits the use of a number of technologies, rather than a single management method (providing these conform to BPEO principles). Although IWM is implied in Britain’s waste strategy, *Making Waste Work*, it has often been overlooked. As a consequence
the current review of Britain’s waste strategy has provided an opportunity to define IWM in a particular way. In essence, this describes the purpose of an integrated strategy as being a means to deal with all the different waste streams flowing from an area in the way which represents the Best Practicable Environmental Option for each. Therefore, a range of options is required which are capable of functioning side by side (Environment, Transport & Regional Affairs Committee, 1998).

Although IWM development is more advanced in Europe (DTI/ETSU, 1994), local authorities in Britain are beginning to organise integrated solutions to waste management. Local authorities in Hampshire are taking an integrated approach to waste management which involves keeping the amount of household waste at 1995 levels, and promoting a more balanced range of management methods as shown in Figure 3.7. This contrasts starkly with Cleveland which is dominated by EfW as a strategy.

Figure 3.7 Comparison of Hampshire and Cleveland waste management strategies

It should also be noted that the dominance of EfW in Cleveland means that there is insufficient waste available for the local authorities to meet their aspirational targets of 25% in 2000. However, they will easily meet the overall recovery target of 40% (Department of the Environment and the Welsh Office, 1995:6).
3.7 Producer Responsibility

In 1994, the EC set out a framework document called the Packaging Directive which demanded that member states undertake a review, and form legislation, to arrest the increasing amount of packaging waste produced within the EC. In response to the Packaging Directive, the Secretary of State for the Environment and the President of the Board of Trade requested that packing producers prepare "...a staged plan to recover (value from) between 50% and 65% of packaging waste by 2000" (Producer Responsibility Group, 1994:1). To prevent EC members committing to single recovery strategies such as EfW, the EC set minimum material specific recycling targets for glass, steel, aluminium, plastic, and paper within the Directive (EC Directive 94/62/EC).

After a considerable amount of debate between the Government and a committee of producers, the Producer Responsibility Group (PRG) formed. The PRG operated for two years as a consultation body to provide the government with an industry plan for increasing the rates of recovery from used packaging in all sectors of the production chain. Britain's legislation for transposing this Directive is based on the concept of shared producer responsibility which was developed by the PRG. The Producer Responsibility Obligations (Packaging Waste) Regulations 1997 (here on in the 'packaging regulations') require producers in all sectors of the packaging chain to take on obligations to recover packaging. 

Producers with obligations under these regulations must either register with the Environment Agency (EA), and prove to the EA that recovery and recycling of packaging has taken place. Alternatively, producers can register with collective schemes called Compliance Schemes which co-ordinate the recovery and recycling of packaging waste on behalf of producers. The main compliance scheme in Britain is called Valpak and it is useful at this stage to briefly describe Valpak's activities to illustrate some of the impacts which the packaging regulations could have on British waste management.

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31 Equivalent legislation in other member states places the obligation at a single point in the packaging chain, such as with the packer/fillers.
3.7.1 Valpak

Of the ten registered Compliance Schemes, Valpak is the largest, having about 80% of the compliance market which equates to more than 2,000 obligated companies. Valpak’s mission is to meet “the legal obligations of its members at the lowest possible cost” while also working “with reprocessors, local authorities, waste managers and voluntary bodies to increase recovery and recycling” (Vantage, Winter 1997/98:3).

Obligated producers and Compliance Schemes must offset their recovery obligations by demonstrating to the EA that packaging waste has been reprocessed (Environment Agency and SEPA, 1997). This is demonstrated through the purchase of ‘compliance evidence’ which usually comes in the form of a Packaging Waste Recovery Note (PRN). PRNs are issued by accredited waste reprocessors, such as paper and steel mills, but also EfW operators. EfW operators and the EA have agreed a protocol on incinerated MSW which permits PRNs to be issued on 19% of the total weight of waste processed.

Valpak are also keen to work with local authorities to extract more packaging from domestic waste. While this will be the most expensive proportion of the packaging waste stream to reprocess (commercial waste is easier and hence cheaper to recover), the targets are sufficiently demanding that it will be necessary to recover materials from MSW. Many in the waste industry believe that the packaging regulations, and schemes such as Valpak, will have a significant impact on both the waste management industry and on householder’s participation in waste management32.

3.8 Non fossil fuel obligation (NFFO)

Prior to income from PRNs modern EfW plants relied on two main sources of income; the gate fee and the sale of energy. The NFFO is an essential component of these energy sales because it gives EfW operators preferential access to the electricity market.

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32 For example, the leading waste management magazine Materials Recycling Weekly has run numerous editorials on the Regulations and Valpak, the issues surrounding the Regulations have been discussed every week since August 1997 and the magazine now publishes a PRN price guide.
Chapter 3: Domestic Waste Management

As part of the privatisation of the electricity industry the NFFO was introduced. The original and main aim of the NFFO was to support the nuclear industry following its privatisation as a result of the 1989 Electricity Act. However, the sale of the nuclear industry did not go as planned, but the NFFO has been left in place to support the other renewable generators. The NFFO gives renewable energy operators preferential access to the electricity market, to help Britain reach its target of generating 1,500MW of energy from renewable sources by 2000. The NFFO requires electricity purchase to pay premium prices for non-fossil fuel electricity; this includes electricity generated from among others, wind, water, biomass, and EfW.

The Electricity Act (1989) introduced the concept of NFFO which requires Regional Electricity Companies (RECs) to buy a contracted amount of electricity from electricity generators who have obtained NFFO quota. The price of electricity from NFFO generators is higher than the pool price for electricity (the pool price is a reflection of the lowest cost fossil fuel derived electricity). RECs recover the high prices paid for renewable energy by inflating the cost of electricity sold to consumers. The Non-Fossil Purchasing Agency (NFPA) was formed in 1990 by the RECs to administer the non-fossil contracts which RECs have a legal requirement to fulfil. The role of the NFPA is to receive and distribute the non-fossil levy to renewable generators, manage non-fossil contracts, and to co-ordinate the RECs’ arrangements for meeting future renewables obligations.

To obtain the advantages of a NFFO contract, generators must bid for and win a limited amount of the quota from the relevant NFFO tranche. For example, an EfW operator can bid for some NFFO prior to completing a package to build a facility. This means that there has been over 2000 MW of NFFO contracted to renewable projects, but only 500 MW of power is being generated (ETSU, 1998). Some details of the NFFO, as it applies to EfW operators, are shown in Table 3.8.

It can be seen from this table that EfW plays a significant part in Britain’s renewable energy strategy. More than a third of all NFFO contracts are for EfW, and just less than

---

ETSU, the energy technology support unit estimate that the peak cost of NFFO contracts will equate to £8 per annum per household (ETSU/DTI, 1998).
half of all NFFO projects which have reached fruition are EfW generators. Although the NFFO is an essential subsidy for EfW generators, it is not central to their success\textsuperscript{34}. The success of EfW projects can more likely be attributed to an urgency to divert waste from landfill, rather than an urgency to generate power. Although the prices paid for electricity generated from waste is diminishing, the 15 and 20 year length of the later tranches has made the NFFO much more suitable for EfW operators who are financing their plants over 25-30 years.

Table 3.8 Non-Fossil Fuel Obligations\textsuperscript{35}

<table>
<thead>
<tr>
<th>NFFO Tranche</th>
<th>Energy from Waste</th>
<th>Total NFFO (including EfW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>contracted for</td>
<td>41</td>
<td>152</td>
</tr>
<tr>
<td>projects</td>
<td>271</td>
<td>472</td>
</tr>
<tr>
<td>242</td>
<td>626</td>
<td></td>
</tr>
<tr>
<td>241</td>
<td>842</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>795</td>
<td>2092</td>
</tr>
<tr>
<td>On-line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>generating</td>
<td>141</td>
<td>145</td>
</tr>
<tr>
<td>capacity</td>
<td>32</td>
<td>182</td>
</tr>
<tr>
<td>28</td>
<td>138</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
<td>466</td>
</tr>
<tr>
<td>Highest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>price contracted</td>
<td>6.0</td>
<td>10</td>
</tr>
<tr>
<td>(p/kWh)</td>
<td>6.6</td>
<td>11</td>
</tr>
<tr>
<td>4.0</td>
<td>8.8</td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td>5.8</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>19.6</td>
<td>35.6</td>
</tr>
<tr>
<td>Expiry date</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>1998</td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>1998</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>2014</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>2017</td>
<td></td>
</tr>
</tbody>
</table>

Prior to the landfill tax, the NFFO was a means by which EfW operators could receive extra income to subsidise gate fees and therefore to compete with landfill. This is now

\textsuperscript{34} This is reflected by the fact that EfW projects have received the second lowest prices in NFFO tranches. Power generated from landfill gas received the lowest.

\textsuperscript{35} Renewable generators are currently bidding for NFFO 5 capacity, which will also be valid for 15-20 years.
less critical because the price of the two management methods has converged since the introduction of this tax. However, the NFFO is still an important source of revenue for EfW operators, but offer incomes such as PRN revenue are important.

3.9 Summary

This chapter has outlined the development of waste management strategies, with particular reference to the situation in Britain. By examining the composition and significance of domestic waste, and the range of legislative and management approaches introduced to tackle the problem, there are a number of key themes that emerge which are of importance to the development of the thesis.

Firstly, the problem of domestic waste is most acute among ‘First World’ developed nations, including Britain, where ‘waste’ is a tolerated by-product of the dominant mode of production. Furthermore, the volume of waste produced shows no sign of decreasing, making the management of waste an increasingly important issue on the political agenda. Secondly, because of the rise to prominence of waste as a social and environmental problem, the issue has become increasingly politicised, with a raft of legislation emphasising targets and obligations. This is particularly important as it marks a shift in emphasis from waste management as merely a problem for local government, to a situation which broadens responsibility for waste to other sectors, as exemplified by the Polluter Pays Principle and the packaging regulations. As a third point, this chapter has highlighted that while waste management strategies are already in place in Britain, these are constantly shifting as waste management ideologies continue to evolve. Yet within these current strategies, it is clear that EfW and recycling have key (although at times seemingly opposing) roles in this new ideology, so it is around these two issues that the thesis will focus from now on.

Finally, it is already becoming clear that there are several scales of analysis which are necessary for understanding the development of waste management strategies in Britain. Waste is an issue which is symptomatic of developed industrial economies, but which is tackled at a range of levels - international (e.g. the EC directives to member states),

36 See Appendix N for a further discussion
national government (e.g. EPA), industrial co-operation (e.g. the packaging regulations) and local government (e.g. Cleveland). There are a number of tensions at, and between, these levels and the next chapter will begin to analyse these further by discussing the status of Cleveland’s waste management within the context of the political economy introduced here.
4. Waste Management in Cleveland

4.1 Introduction

Chapter 3 discussed waste management practices and policies, highlighting the increasingly politicised nature of waste. This chapter moves to the regional scale to offer a detailed examination of the issues of waste and the environment within the specific context of Cleveland. To understand the regional setting of waste management in Cleveland it is necessary to examine broader environmental and political struggles which have occurred, and continue to occur, in Cleveland. Typical struggles are between residents and institutions whose actions, residents believe, have or will cause degradation to their local and regional environment. These struggles reached a climax in the early 1990s when there were several proposals to manage and/or dispose of waste in the region, and it will become apparent that these contests, and the plurality of environmental perspectives in Cleveland, serve to contextualise the decision to build this EfW facility in a particular way. One of the interesting aspects which comes out of this analysis is that the decision to build a new EfW plant was not contested, whereas nearly all other waste management plans in the region have been.

The majority of the material discussed in this chapter is original and was obtained from numerous in-depth interviews which were conducted in Cleveland throughout 1995 and 1996. These interviews were undertaken with key policy makers, politicians, industrialists, academics and members of environmental organisations. The interviews were necessary for developing a contemporary understanding of waste management in Cleveland. The issues discussed during these interviews are shown in the following box. An interview guide was used during the in-depth interviews to remind the interviewer of the topics which needed to be discussed (Newell, 1993). This guide is included in Appendix C. A list of the people interviewed is included in Appendix D.
Chapter 4: Waste Management in Cleveland

Issues covered during interviews with key figures
- Definitions of waste
- Responsibility for waste
- Energy from waste
- Recycling
- Composting
- Specific difficulties for waste management in Cleveland
- The suitability of the British waste strategy for Cleveland
- The role of the NFFO in waste management
- Public accountability
- Long term views of waste management
- Public perceptions

4.2 Cleveland

As Figure 4.1 shows, Cleveland is mainly an urban and industrial area, and at 228 square miles it is one of the smallest counties in England and Wales. Divided by the River Tees, Cleveland comprises of four local authorities: Hartlepool and Stockton-on-Tees to the North; and Middlesborough and Redcar & Cleveland (formerly Langbaurgh) to the South. At the time of the 1991 census the population of the County was 550,290 (OPCS, 1993), producing approximately 225,000 tonnes of household waste per annum.

Geographically, Cleveland is a county of contrasts. South of the Tees, the Eastern seaboard is bounded with 600 foot cliffs (Cleveland means 'land of cliffs'), yet to the North of the Tees there is an expanse of tidal flats, many of which have been drained and reclaimed from the sea at Seal Sands. Well farmed agricultural land stretches out to the North and West of the county, while the Southern border is defined by the moorland of the Cleveland Hills.
4.2.1 Industrial history

While heavy industries (such as steel and ship manufacturing) and trading developed beside the Tees in the 19th century, a new kind of industry boomed in Cleveland in the 20th century, and it continues to dominate the county today. At the turn of the century several companies began producing chemicals and fertilisers in the county, primarily around Billingham. In 1926 a number of these formed Imperial Chemical Industries (ICI), and the ICI factory at Billingham soon became the largest of its kind in the Commonwealth. The dominance of the chemical industries continues today, with ICI continuing operations at Billingham, and at Wilton in the south-east of the region.
(Wilton is also the home to 12 other chemical companies). Additionally, Seal Sands to the Northeast hosts industries processing North Sea petroleum products. The presence of the chemical and petro-chemical industries means that Cleveland is one of the largest chemical processing sites in Europe. Cleveland also hosts a number of large power suppliers. In 1983, Hartlepool’s nuclear power station was commissioned and sited on the Tees to provide cooling water. A decade later the ‘dash for gas’ and Cleveland’s proximity to North Sea gas fields meant that an American company (Enron) has built a large power station South of the Tees at Eston. Despite the high demand for power by petro-chemical and other industries in Cleveland, the region is a net exporter of energy.

4.2.2 Political context

The two-tier system of four local authorities and the County Council came to an end on 1st April 1996 when CCC was abolished and the four Borough Councils became Unitary Authorities (UAs), forming a single tier local government structure. The new UAs maintain the same geographic limits as the Borough Councils and keep the same names, except Langbaurgh which is now called Redcar and Cleveland. ‘Cleveland’, or ‘Cleveland county’ will be used here to describe the four areas administered by the UAs. The political composition of these four authorities in 1997 is summarised in Table 4.1. Cleveland is Labour dominated and is also represented in the European Parliament by a Labour MEP.

Table 4.1 Political composition of Cleveland (000's votes cast in 1997 General Election)

<table>
<thead>
<tr>
<th></th>
<th>Labour</th>
<th>Conservative</th>
<th>Liberal Democrat</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middlesborough</td>
<td>62.3</td>
<td>26.6</td>
<td>7.9</td>
<td>2.8</td>
</tr>
<tr>
<td>Stockton</td>
<td>58.5</td>
<td>25.6</td>
<td>9.5</td>
<td>3</td>
</tr>
<tr>
<td>Redcar &amp; Cleveland</td>
<td>33.0</td>
<td>11.3</td>
<td>4.7</td>
<td>0</td>
</tr>
<tr>
<td>Hartlepool</td>
<td>27.0</td>
<td>9.5</td>
<td>6.3</td>
<td>1.7</td>
</tr>
</tbody>
</table>


However, the Teesside Development Commission (TDC), the regions development commission, was not an elected body, but it made important planning decisions and had

37 Some people still use the name Teesside to describe Cleveland county, unless a specific area is referred to this colloquialism will be upheld.
considerable local power between 1987 and 1997. The TDC, which is now being run-down, was set up as a result of the 1980 Local Government Planning and Land Act in 1987. Its remit was to develop the most economically depressed areas of Cleveland, including 12,000 acres along the Tees corridor and a pocket of land around Hartlepool’s docks. The TDC had planning control for these areas, and in most cases a TDC planning decision would override decisions made by CCC, or the 4 local authorities. The TDC meant that from 1987 to 1997 some parts of Cleveland had three tiers of planning authorities - the TDC, CCC and 4 local authorities.

In addition to elected MPs, local government officials, and the TDC, there are a large number of local activist groups based in and around the Cleveland area, and most of these are summarised in Table 4.2. All the known groups are included at this point so that an idea of the depth of feeling about the local environment can be gained.

The summary in this table clearly indicates that there is a considerable amount of concern about the local environment in Cleveland, particularly when residents feel it is threatened by industrial activities. This concern has, to some extent, been countered with the formation of a unique body called the Industry Nature Conservation Association who aim to promote both the interests of the environment and industry in Cleveland. Most members are local companies who are given ecological advice on techniques of protecting plant and animal life in and around industrial areas (Muir, 1996).38

38 As a result of the large ‘exclusion zones’ round many of the chemical plants Cleveland has some undisturbed habitats which are chosen by timid birds and other wildlife.
### Table 4.2 Campaign groups in Cleveland

<table>
<thead>
<tr>
<th>Group</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save Our Sun</td>
<td>Residents campaign to make Enron take action to stop the large clouds of steam emitted from the squat cooling tower of their power station which engulfs homes.</td>
</tr>
<tr>
<td>STINC (Stop Toxic waste Incinerators in Cleveland)</td>
<td>This group ran a successful campaign in the late eighties to stop 3 of 4 merchant waste incinerators being built in the county. They are currently disbanded, but some members are still 'active' locally.</td>
</tr>
<tr>
<td>Red Alert</td>
<td>A Billingham based pressure group which formed to protest against Whelan Environmental opening a toxic waste treatment plant in Billingham. Permission for the plant was obtained despite their objections. Red Alert have led other protests, including one against the H.J. Banks landfill at Haverton which is discussed below.</td>
</tr>
<tr>
<td>BAND (Billingham Against Nuclear Dumping)</td>
<td>This group formed in 1983 when NIREX proposed to dump high and intermediate level radioactive waste in anhydrix mines under Billingham. The group later grew into B(ritain)AND who still hold meetings. There was also a L(angbaurgh)AND.</td>
</tr>
<tr>
<td>Battle for Bottle Hill</td>
<td>This group fought off proposals by CCC to open a landfill at Bottle Hill near Wolviston in the early 1990s.</td>
</tr>
<tr>
<td>West Lane Residents Associations</td>
<td>West Lane Residents Association have been complaining about emissions from the Portrack incinerator since 1976.</td>
</tr>
<tr>
<td>Carlin Howe Residents</td>
<td>Several residents living near to Carlin Howe Farm landfill at Dunsdale organised a coherent campaign in opposition to the site. Permission for the landfill was obtained despite their objections.</td>
</tr>
<tr>
<td>Langbaurgh Against Pollution Group</td>
<td>Support the activities of STINC.</td>
</tr>
<tr>
<td>Neon</td>
<td>Protested when Union Carbide bought a plant at ICI Wilton and continue to protest against their presence in Cleveland.</td>
</tr>
<tr>
<td>Teesside Green Party (TGP)</td>
<td>Although the party lacks funding to run in local elections, the Teesside Green Party successfully raise various environmental issues in the public domain. The Teesside Green Party are opposed to all incineration.</td>
</tr>
<tr>
<td>Friends of the Earth</td>
<td>Similar role to Green Party, currently concentrating on transport.</td>
</tr>
</tbody>
</table>

### 4.2.3 Social structure

Household waste is directly influenced by personal consumption, hence the socio-economic status of a population influences domestic refuse, and this relationship was discussed in Chapter 3. Until the 1970s, Cleveland was a relatively prosperous region with residents enjoying good employment prospects within the ship, steel and chemical industries. This prosperity began to decline in the seventies as the ship, steel, and chemical industries faced foreign competition while also becoming increasingly

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39 Here the term 'merchant' is used to describe commercial incinerators which burn clinical, toxic and industrial wastes. The term does not include 'in-house' dedicated incinerators or household waste incinerators.
mechanised, and this resulted in the loss of a huge amount of jobs in the 1980s. For example, ICI once employed 40,000 people on Cleveland; today they employ only 9,000 (Lee, 1995). Table 4.3 provides summary socio-economic details of the region.

Table 4.3 Socio-economic group and unemployment by region in 1995/96

<table>
<thead>
<tr>
<th>Socio-economic group (%)</th>
<th>Hartlepool UA</th>
<th>Redcar and Cleveland UA</th>
<th>Middlesborough UA</th>
<th>Stockton UA</th>
<th>England and Wales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employers, managers &amp; professionals</td>
<td>17.7</td>
<td>19.3</td>
<td>19.4</td>
<td>23.3</td>
<td>28.0</td>
</tr>
<tr>
<td>Other non-manual</td>
<td>18.0</td>
<td>22.4</td>
<td>24.2</td>
<td>24.7</td>
<td>24.4</td>
</tr>
<tr>
<td>Skilled manual</td>
<td>36.2</td>
<td>33.1</td>
<td>29.8</td>
<td>30.3</td>
<td>29.6</td>
</tr>
<tr>
<td>Semi-skilled manual</td>
<td>21.2</td>
<td>18.9</td>
<td>18.4</td>
<td>16.0</td>
<td>13.8</td>
</tr>
<tr>
<td>Unskilled manual</td>
<td>7.0</td>
<td>6.3</td>
<td>8.2</td>
<td>5.7</td>
<td>4.3</td>
</tr>
<tr>
<td>Unemployed</td>
<td>12.7</td>
<td>12.4</td>
<td>15.1</td>
<td>12.0</td>
<td>8.4</td>
</tr>
</tbody>
</table>


It is clear from the above table that the region as a whole has a less affluent population than the national average and unemployment rates throughout the region are considerably higher than for the rest of England and Wales. These levels of unemployment, and the largely urban and industrialised nature of the region, have health implications for Cleveland. Table 4.4 provides some key health indicators for the region and it is clear that the region generally has higher mortality and morbidity rates than the national averages.

Table 4.4 Cleveland's health in 1995/96

<table>
<thead>
<tr>
<th>Health indicator</th>
<th>H</th>
<th>R &amp; C</th>
<th>M</th>
<th>S</th>
<th>Cleveland</th>
<th>E &amp; W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality ratio</td>
<td>117</td>
<td>114</td>
<td>121</td>
<td>113</td>
<td>116</td>
<td>100</td>
</tr>
<tr>
<td>% deaths cancer</td>
<td>28.9</td>
<td>26.2</td>
<td>27.3</td>
<td>27.8</td>
<td>27.4</td>
<td>25.2</td>
</tr>
<tr>
<td>% deaths heart</td>
<td>42.2</td>
<td>45.9</td>
<td>42.2</td>
<td>42.5</td>
<td>43.3</td>
<td>44.3</td>
</tr>
<tr>
<td>% deaths respiratory</td>
<td>14.9</td>
<td>14.7</td>
<td>11.0</td>
<td>14.3</td>
<td>14.3</td>
<td>15.3</td>
</tr>
<tr>
<td>Infant mortality</td>
<td>8.2</td>
<td>8.1</td>
<td>7.8</td>
<td>6.9</td>
<td>7.7</td>
<td>6.9</td>
</tr>
<tr>
<td>Morbidity ratio</td>
<td>130</td>
<td>127</td>
<td>131</td>
<td>118</td>
<td>126</td>
<td>100</td>
</tr>
</tbody>
</table>


Although Cleveland has a relatively small population, it has a high population density. When discussing the management of household waste, population densities are usually
more significant than total populations. Table 4.5 shows that the regional population density is 9.4 people per hectare, while the average for England and Wales is only 3.4 people per hectare.

<table>
<thead>
<tr>
<th>Population</th>
<th>H</th>
<th>R &amp; C</th>
<th>M</th>
<th>S</th>
<th>Cleveland</th>
<th>E &amp; W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (000's)</td>
<td>91.8</td>
<td>144</td>
<td>143.6</td>
<td>177.2</td>
<td>546.6</td>
<td>49,890</td>
</tr>
<tr>
<td>Population density</td>
<td>9.7</td>
<td>5.9</td>
<td>26.6</td>
<td>8.9</td>
<td>9.4</td>
<td>3.4</td>
</tr>
</tbody>
</table>


It can be seen from this table that Stockton has the highest population of the four UAs, while Middlesborough UA has the highest population density because of its compact urban nature. Aside from Redcar and Cleveland UA, which is experiencing gradual re-population, Cleveland is depopulating and it is predicted that this trend will continue into the next millennium (INFOS, 1996).

**4.3 Waste management in Cleveland**

Cleveland's industrial heritage has broad implications for waste management in the county. Despite limited iron and potash mining there have been few extractive industries in the region, and consequently there has been an ongoing scarcity of landfill sites. This has led to some alternative approaches to waste management in Cleveland. The Tees, and its low lying marshland, have been the focus for much of these approaches since the industrial revolution. Slag from Middlesborough's ironworks was used on the North side of the Tees to build embankments to safeguard the area from flooding (Clapp, 1994:232). The form of these embankments was first engineered with slag and then all manner of wastes were used as back-fill. In 1871 twenty miles of slag embankments had been built along the Tees, and by 1952 a foreshore area of 3,600 acres had been reclaimed for subsequent development (Moorsom, 1995). These dumping/reclamation projects began to delineate what will be referred to later as the Cleveland Waste Triangle or CWT, discussed in section 4.3.5. The most recent project of this kind was the reclamation of tracts of tidal mud flats at Seal Sands, where
millions of tonnes of slag, power station ash, household, and commercial waste have been dispersed.

Until the mid-eighties it was sufficient for much of the industrial waste to exit the region via the Tees, or to be used in land reclamation projects. The problem of household waste disposal, however, became a problem earlier because it was not suited to land reclamation and could not be dumped at sea. This meant that until 1976 the region landfilled most household waste, although some was incinerated in an old fixed grate incinerator.

The shortage of landfill sites and increased pressure to dispose of household waste in a safe and efficient manner resulted in a Local Government Operational Research Unit (LGORU) examining the region’s waste disposal provisions. The study concluded that even if more landfill capacity could be found, some form of waste treatment plant was necessary to minimise future demands for landfill void. The LGORU study recommended processing waste by means of a single incinerator sited at Portrack Marshes. When Cleveland County Council was formed in 1974, waste management officials were keen to implement this recommendation because they preferred a region-wide disposal strategy and felt that a single incinerator would provide a secure strategy for the county.

As a consequence, the construction of the Portrack incinerator went ahead and when the 200,000 tonnes per annum (tpa) incinerator was opened in 1976 it was one of the largest of its kind in the country. In addition to incinerating household waste, Portrack was designed to burn sewage sludge, the idea being that the heat from the burning refuse would be sufficient to dry and burn the sludge, there was also an auxiliary incinerator for incinerating animal carcasses. It was felt that the innovative Portrack incinerator would be the solution to Cleveland’s waste disposal problems (Moorsom, 1995).

Despite these high expectations, the Portrack incinerator got off to a precarious start, with the co-incineration of sewage sludge being plagued from the beginning. Insufficient heat coupled with wet sludge resulted in poor combustion causing serious
problems for stack emissions and ash disposal. The attempt at co-incineration at Portrack finally ceased in 1984 when the Northumbrian Water Authority built a new treatment plant near to the incinerator and obtained a licence to dump sewage sludge at sea.

When the Control of Pollution Act was enacted in 1974 it stated that disposal authorities (then it was CCC) had to produce 10 year waste disposal plans, with periodic reviews. CCC produced their first plan in 1982 and reviewed it in 1987. As in the LGORU study, the 1987 review revealed that there would be a short-fall in Cleveland’s landfill capacity in the coming decade. After considering many options, including constructing a smaller incinerator in the east of the county, the 1987 Disposal Plan recommended that new landfill capacity had to be found and that the use of the Portrack incinerator, which had been burning less waste than its design capacity, must be maximised. Shortly after 1987, Portrack’s operation was extended from 5 to 7 days a week and all year round. This increased the volume of waste which could be incinerated to 210,000 tonnes per annum.

The announcement of the 1989 EC Directive on municipal incinerators (89/429/EEC) meant that Cleveland’s Waste Management Committee needed to review the operations of Portrack because it would not meet the standards introduced under this Directive, which was implemented in 1996. In light of this directive CCC decided to retain the county’s reliance on incineration as the primary disposal method. This decision meant that Portrack would need to be either upgraded or replaced (Walsh, 1996).

Shortly after the EC directive on incinerator emissions was announced, the County Council were notified of plans to abolish the two tier local government system. These plans effectively imposed a second deadline (of April 1996) on CCC because they felt that they had a responsibility to implement a new waste strategy before they were disbanded (Walsh, 1996).

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40 The ash contained organic matter which gave off methane when landfilled. This problem was compounded by the fact that the methane emissions were rapid and therefore particularly hazardous.

41 Details of the emissions from the Portrack incinerator are included in Appendix E and details of the EC emission limits are given in Appendix A.
The County’s initial response to the directive on emissions was to announce publicly that it would upgrade the Portrack incinerator, and in so doing it would not need to submit either a planning application, or an Environmental Statement (ES), because there was no change of land use. The TDC, who were the planning authority for this site, took a very different view of the Portrack incinerator, which is located at the western edge of their prestigious riverside developments. The TDC insisted that CCC should submit both a planning application and an ES if they wished to upgrade the Portrack incinerator and it was clear from their response that the TDC were not particularly keen on the idea of refitting Portrack.

The tone of the TDC’s response was such that CCC abandoned the idea of a retrofit and instead submitted a planning application and ES which proposed building a modern EfW facility on the Portrack site. The rebuild would require considerable private finance and CCC submitted their plans in 1992 with Northumbrian Environmental Management (NEM), who were their preferred Joint Venture Partner (JVP).

Several over-lapping and interacting issues emerged after CCC had decided to retain incineration at the core of its disposal strategy. These issues need examining because they frame the final proposal to build the EfW facility at Haverton, Billingham.

4.3.1 The CCC/NEM joint venture

CCC estimated that it would cost £50 million to build a new EfW facility and to go ahead with this plan a private waste management company would be needed as a joint venture partner (JVP) to raise capital and enter the tendering process for a long term disposal strategy for the county. The process of selecting a partner is undertaken through compulsory competitive tendering (CCT), where WMCs can bid for a waste contract defined by a set of criteria. Although NEM was CCC’s ‘preferred’ partner, the county had to go through the CCT process and invite other WMCs to bid for the waste contract.

When the County Council advertised for a Joint Venture Partner the criteria were extremely specific, with the Council requesting a local partner with waste management experience and financial security. CCC could not specify that they wanted to build an
Chapter 4: Waste Management in Cleveland

EfW facility because it would be deemed non-competitive. However, "... it was tacitly accepted that incineration would continue to be an option for waste disposal on Teesside" (O'Rourke, 1996:5). Allowing this level of specificicity distorts the CCT process because contract specifications can be so particular that they serve to exclude all but the preferred partner. This appears to be the case in Cleveland and despite other bids, the NEM proposal to build an EfW plant was accepted as the best option.

Some of the local authorities and interested parties (such as Teesside Tomorrow) felt that it was hypocritical of CCC to choose NEM as its preferred partner, due to the fact that CCC had opposed the company's proposals for a sludge and toxic waste incinerator 200 metres to the West of the Portrack site. There was a feeling among some people in Cleveland, that by collaborating with NEM, the County Council were not taking a coherent position in supporting local concerns for 'the environment' (Ivan, 1995; Holmes, 1995; and Woodhouse, 1996).

4.3.2 Environmental protest in Cleveland

NIREX, the nuclear waste executive, ignited a decade of intense protest in Cleveland when in 1983 they proposed to dump nuclear waste in anhydrite mines under Billingham. This proposal resulted in the formation of BAND who engaged in a battle with NIREX until the plan was finally suspended. Shortly after the NIREX controversy there were several proposals to build merchant waste incinerators in Cleveland. Having cut their campaigning teeth at BAND, several former campaigners helped to form STINC to mount further protest.

STINC formed in 1989 when "... people living in Cleveland began to become aware of the interest being shown by (as many as five) 'merchant' trading waste disposal companies, in building high temperature toxic waste incinerators in Cleveland" (STINC, 1991). The protestations of STINC were central in determining the future of merchant incineration and other waste disposal practices in Cleveland. At the time STINC were active, Cleveland was being targeted as a suitable place for siting disposal facilities for British and European waste. This type of land use was encouraged in the late 1980s when the TDC advertised Cleveland throughout Europe as a suitable site for waste
management operations (Palmer, 1995). Three merchant incinerators (and a fourth at Gateshead) became central to shaping the future of waste operations in Cleveland. Table 4.6 illustrates the abundance of waste facilities which sought planning permission in the late 1980s and 1990s.

Table 4.6 Proposed waste facilities in Cleveland

<table>
<thead>
<tr>
<th>Proposal and year</th>
<th>Developer</th>
<th>Competent authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal Sands toxic waste incinerator (1988)</td>
<td>Cory Environmental Ltd.</td>
<td>CCC</td>
</tr>
<tr>
<td>Tyne Tees Wharf incinerator (1989)</td>
<td>Caird Group Plc.</td>
<td>CCC</td>
</tr>
<tr>
<td>Portrack sewage sludge incinerator (1989)</td>
<td>NEM and ITE who wanted to use chemical waste to fuel process</td>
<td>TDC</td>
</tr>
<tr>
<td>Clinical waste incinerator (1990)</td>
<td>Caird Group Plc.</td>
<td>CCC</td>
</tr>
<tr>
<td>Tyne Tees Wharf incinerator (1990)</td>
<td>Dynochem</td>
<td>TDC</td>
</tr>
<tr>
<td>Bottle Hill Farm landfill (1992)</td>
<td>CCC</td>
<td>CCC</td>
</tr>
<tr>
<td>Carlin House Farm Landfill (1993)</td>
<td>CCC/NEM</td>
<td>CCC</td>
</tr>
</tbody>
</table>

Source: Petts and Eduljee (1994).

The three merchant incinerators central to STINC’s campaign were: a toxic waste incinerator to be built by CORY Environmental Ltd (CEL) at Seal Sands; a combined toxic waste and sewage sludge incinerator to be built by International Technology Europe (ITE) and NEM at Portrack (this was a novel process); and the Caird Group were to build a clinical waste incinerator at Tyne Tees Wharf, Middlesborough. As a result of mounting public pressure all three incinerators were refused planning permission - CEL’s by CCC and the other two by TDC. Both CEL and NEM/ITE appealed against the planning decision and in March 1990 the Secretary of State for the Environment set up a ‘Linked Public Enquiry for the Northern Region’. The linked enquiry involved the two Cleveland incinerators and a third NEM/ITE incinerator at Howdon (Gateshead) which had also had its planning application turned down. The Caird proposal also went to a public enquiry, but it was separate from the linked enquiry. The outcome of both the linked and separate public enquiry was to refuse all
but one of the planning applications, and the exception was CEL, who were granted permission to build a toxic incinerator at Seal Sands\textsuperscript{42}.

The actions of STINC and the outcome of the public enquiries were significant in setting the general context of household waste incineration in Cleveland. However, it also formed a substantial public diversion while CCC were revising their incineration strategy. STINC were at the end of an exhaustive two year campaign when CCC announced that they were rebuilding Portrack. Even after an arduous 10 year struggle trying to prevent the county from becoming a recognised place for waste disposal, even those who were fundamentally opposed to any incineration, notably STINC, did not have the energy to enter into another planning battle. Under such circumstances, a modern EfW plant, which replaces an old polluting incinerator and reduces the region's demand for landfill, might well be perceived as being less problematic. A Stockton local authority waste manager summed up the Cleveland context in the early nineties:

"At the public level it's fair to say that people were punch drunk with applications for incinerators" (Milne, 1996).

Although STINC raised some objections to the CCC/NEM proposal for rebuilding Portrack they soon disbanded due to other commitments and campaign exhaustion (Holmes, 1995 and Palmer, 1995). Although there is a rich history of community protest in Cleveland, it is perhaps ironic that the fatigue from earlier struggles could have resulted in the new municipal incinerator gaining planning permission more easily than might otherwise have been the case.

4.3.3 The image of the Tees corridor

A central remit of the TDC was to elevate the image of Cleveland to provide an attractive place where people can live and new businesses locate. This remit and the actions of a group called Teesside Tomorrow, who aim to promote business in Cleveland, led the TDC to turn down CCC and NEM's planning application to build a new EfW facility at Portrack.

\textsuperscript{42} Since the 1990 linked enquiry CEL have failed to build their incinerator due to a lack of material requiring disposal. This is due to the increased use of clean technologies which promote source reduction and the use of toxic waste as a fuel in cement kilns (Middletown, 1996).
When TT heard of the CCC/NEM proposal they launched an injurious attack on both parties and the plans for the Portrack rebuild. The goal of TT was not to have CCC reconsider its waste strategy, rather they wanted the site for a new incinerator moved away from the Portrack location, which was close to the main areas of redevelopment. In practising corporate NIMBYism, TT and TDC wanted to shift the new EfW plant further into the CWT. Although the argument for enhancing Teesside’s image was central to TT’s attack on the CCC/NEM proposal, those who spearheaded the campaign used many arguments to get the facility moved. Teesside Tomorrow accused CCC of having double standards because in the year prior to them choosing NEM as their JVP they refused the company permission to operate an incinerator adjacent to Portrack. These arguments prompted a leading figure at TT to conclude the following:

“I believe CCC are not playing with a straight bat. They are not making it clear that the application is being put forward as an independent company. They are hiding behind the coat of the Council’s respectability and accountability. ... I firmly believe that to continue to improve the future of Teesside for the next 30 years, the incinerator must be moved as it is a visual eyesore as well as a perceived hazard” (Ivan, 1995:7).

Although many a varied argument was pitted against the Portrack rebuild, the critical argument which led to the application being refused was that CCC and NEM had not adhered to the principle of adopting the BPEO (best practicable environmental option) in selecting a site. This was because no other locations for the plant had been considered and it was argued that there were many more appropriate locations.

4.3.4 Role of the Unitary Authorities

By the time CCC had announced its desire to retain incineration at the core of its disposal strategy the Local Government Commission had recommended the abolition of CCC. This reorganisation has meant that the UAs have inherited the disposal contract agreed between CCC and NEM. Realising that this would be the case, the then Borough Councils asked CCC to have a more active role in planning Cleveland’s waste strategy. However, this request was ignored by the County Council, principally because the UAs were opposed to incinerating the majority of the county’s waste. In light of this the UAs asked the Department of the Environment to intervene, to permit them more input into

43 In fact TDC commissioned an independent study which identified 76 other suitable locations.
the waste plan, however, the UAs were told that waste management plans would continue to be a county matter until April 1996.

Rather than a long term commitment to EfW, the local authorities, principally Stockton and Hartlepool, argued that a more integrated strategy based on recycling should be developed (Moorhead, 1995, and Craig, 1995). In addition to an integrated approach, Redcar and Cleveland UA suggested that a shorter term contract, for example 10 years, should be considered while a proper evaluation of the county’s requirements was undertaken. The Stockton authority opposed the Portrack rebuild, which fell in their jurisdiction, arguing that the site was unsuitable for redevelopment because it is classified as ‘green belt/landscaping’ in the Stockton Local Plan.

The feeling that CCC had not addressed all the possibilities for waste management in Cleveland was such that the four authorities commissioned a study to “..identify a range of possible options for the management of wastes currently handled by Cleveland County Council ... to help the Borough Councils assess an appropriate waste management strategy” (AEA Technology, 1994). The local authorities hoped that this report would give mettle to their argument that other (non-incineration) components of an integrated strategy should be considered. This report, however, did not lend support to their alternative proposals of the local authorities because the report concluded that “based solely on environmental and technical grounds, there is little to choose between the various options presented, given that each would be undertaken using Best Available Techniques as currently available...” (AEA Technology, 1994:V).

4.3.5 The Cleveland Waste Triangle

Nearly all of the waste facilities which have been built, or proposed to be built, have been targeted in a particular area of Cleveland (the exception is Guisborough which is an established landfill area). This area of Cleveland is named here as the Cleveland Waste Triangle (CWT), and it is illustrated in Figure 4.2 below. The CWT has been designated as an area to dispose of waste for many years beginning with the 19th Century foreshore reclamations.
Chapter 4: Waste Management in Cleveland

Figure 4.2 The Cleveland Waste Triangle

It is clear from Figure 4.2 that many of the waste facilities built or proposed in Cleveland have been sited in the CWT, and in particular, the area around Haverton has been targeted as a suitable location for many of these waste facilities. In the 1960s, Haverton was branded as the most polluted town in Britain and today it is the focal point of the CWT. In addition to toxic and nuclear waste, the CWT has been targeted as an area suitable for domestic waste management for many years. Although the EfW facility and the H. J. Banks landfill are all within the CWT, as shown on Figure 4.2, the area delineated by the triangle has become consolidated since Portrack’s closure. The controversy which surrounded the relocation of the Portrack incinerator epitomises the way in which the CWT is used as the region’s scapegoat for waste. While the TDC and Teesside Tomorrow did not approve of plans to rebuild at the Portrack site, which is on the edge of the CWT, they soon came up with a suggestion to build a new EfW plant deep within the triangle.

The area defined here as the CWT, and in particular the area around The Clarances (Haverton), is viewed openly as an acceptable area in which Cleveland’s waste can be disposed. However, this area of Cleveland may actually be unsuitable, in terms of its potential for waste disposal, because it is low lying and near to the river. Nevertheless, the CWT has become defined as an area which is already socially and environmentally deteriorated. A view toward the area prevails which assumes that where an area has
been used for waste management previously, it can continue to be used for such purposes. This type of thinking has been advocated by planners in the area, particularly the TDC when they, along with Teesside Tomorrow, practised corporate NIMBYism and pushed the new EfW facility from the Portrack site further into the waste triangle. This action is particularly inconsistent because the TDC was formed to break the cycle of environmental degradation and social deprivation on Teesside, yet this cycle is reinforced through the consolidation of the CWT. This pattern is also occurring in other parts of Britain where new EfW plants are being built, or are being planned on the same sites as old incinerators (e.g. Dundee, Birmingham, Bolton, Hampshire, and London).

In addition to this approach to locating waste sites, there is also an issue of environmental injustice in this area. Most of the waste facilities in the CWT, including the EfW facility, are situated within the electoral wards of Portrack & Tillery and Saint Cuthberts. These wards have some of the highest percentages of health problems and mortality ratios in the county. Unemployment rates are also higher than Cleveland and national averages. Clearly the area around The Clarances and the CWT is a deprived area of the county, and this deprivation is compounded by the addition of the region’s waste facilities. Therefore, while many residents might be concerned about the pollution associated with EfW, it is only a limited section of the Cleveland population who will experience these local impacts.

Therefore, the physical impacts and associated costs of an EfW facility which manages most of the county’s waste are borne by a few. It is often the case that this minority are the socially and economically deprived members of a region who do not have the means to defend their neighbourhood from industrial development. This was demonstrated quite vividly in Cleveland when the actions of a group of privileged businessmen served to push the EfW facility into the heart of the deprived area shown as the CWT in Figure 4.2

4.4 Cleveland Waste Management

After the TDC refused the CCC/NEM partnership permission to rebuild at Portrack, Cleveland County Council, Northumbrian Environmental Management, and the
Teesside Development Commission worked together to find an alternative site. To prove that CCC and NEM had not adhered to BPEO in choosing a site the TDC had already commissioned an independent study to locate suitable sites. This study identified 76 sites, mainly industrial, which were suitable for waste disposal, and after several reviews this list was reduced to two sites; one at Seal Sands, and the second at Haverton. The Haverton location was chosen in preference to Seal Sands because transportation costs would have been higher at the Seal Sands site because it is further from the main population centres.

There are many components which need to be co-ordinated before a disposal company can begin to construct an EfW facility. Figure 4.3 summarises the order of events which took place in Cleveland leading up to the creation of the private waste disposal company in July 1995. While this diagram is a useful summary, it understates the complexity inherent to both forming a JVC and gathering all the components which are integral to an EfW scheme. The administration and detail of some of the above activities are given further attention below.
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Figure 4.3 Events leading to the construction of the Cleveland EfW facility

1988
- Pending EC legislation brings Portrack into the spotlight

1989
- CCC announce re-fit of Portrack
- TDC dispute CCC re-fit, arguing they need ES and planning permission. CCC drop plans for a re-fit.

1990
- CCC forms WDA in accordance with EPA
- WDA review 1987 waste disposal plan and confirm incineration as the chosen option.

1991
- Studies on Portrack conclude that an upgrade is insufficient
- WDA concludes that it is necessary to pursue a joint venture to obtain capital for a Portrack re-build
- CCC set up a LAWDC for the interim period before the planned JV takes over

1992
- WDA invites companies to tender for the joint venture
- Criteria for JVP are very specific
- NEM selected as joint venture partner

1993
- Negotiations of the JVC
- Objections from TDC and TT
- Submission of Planning and ES for Portrack re-build
- CCC, NEM, & TDC work to find new site

1994
- CCC invites tenders for the disposal contract
- Submission of Planning and ES for Haverton
- Planning permission granted

1995
- Decision making process
- Contract awarded to NEM
- Joint Venture Company (CWM) is set up
- Construction of EfW plant starts

1998
- Construction of the facility complete

Adapted from O'Rourke (1996)
### 4.4.1 Environmental statement

An environmental statement (ES) has to be submitted at the same time as the planning application with large developments such as EfW facilities. The ES for the Haverton site was similar to the ES for the Portrack re-build because the same technology was being used, although there were some key changes. Although the Portrack incinerator was refused planning due to a failure to adhere to the principles of BPEO, the image of the plant was one of the main reasons parties such as TT and the TDC became involved. As a result, substantial changes to the architecture of the building proposed for the new site were made.

An interesting and telling change which was made between the Portrack environmental statement and the Haverton ES was the description of the incinerator stacks. In the ES for the Portrack rebuild the stacks were described as follows: "The plant will be furnished with three steel chimney, one for each furnace line and one as a spare for future expansion of the plant" (Environmental Resources Limited, 1992). However, in the ES for the Haverton incinerator "a third stack will be present for both aesthetic and stability purposes..." (Environmental Resource Management, 1992: 34). The possibility of expanding the Haverton site is discussed later, but it is interesting to note at this stage the more cautious approach in the second environmental statement.

### 4.4.2 Planning

Since CCC and NEM had consulted the TDC and TT before the planning application was submitted, neither of these parties raised any opposition to the Haverton planning application. Both parties felt that Haverton was a more suitable site for the incinerator, having minimal impact on the region’s image. It was argued that the Haverton site had less impact because it was away from the main roads running through the county and also from Middlesborough and Stockton town centres. While the TDC were the

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41 Attention also had to be given to the ecological impact of the Haverton incinerator because it lies within the Tees Wildlife Corridor. Some EfW schemes reuse their cooling water, passing it through a series of cooling towers, however, this system extracts cooling water from the Tees at the rate of 3,400 cubic metres an hour, and returns it at 16°C above ambient temperature. At the time, the only concern of the National Rivers Authority with this rise in temperature was the possibility that it would cause a thermal barrier, impeding the movement of migratory fish, particularly salmon smolts.

42 Note that in Figure 4.4 only two of the stacks are shown.
planning authority for the Portrack site, Cleveland County were the planning authority for the Haverton site, and this eased the application further.

Public consultation is an important process in any planning application. While CCC and NEM followed the mandatory procedures by advertising the application in the local papers, they failed to muster much public interest in the plans. Blame for this failure cannot be placed with the developers because several factors resulted in there being little public involvement in the development of this EfW plant. Firstly, there is a lengthy history of well organised protest in Cleveland, and there are several groups in the Haverton area who are not happy with the EfW facility. These groups never mustered any protests at the time the planning application was submitted because they were at the end of long campaigns to stop other, mainly hazardous, facilities. Red Alert were engaged in a battle to prevent Whelan Environmental from opening a toxic waste processing facility in Billingham, and STINC had recently opposed several merchant incinerators around the county. When asked, environmental groups in Cleveland expressed a concern for the Haverton EfW proposals, but all the groups said that at the time they were unable to organise a coherent voice of opposition.

Secondly, there was very little coverage of the Haverton planning application in the local press, this could be due to the fact that the story was not as exciting as when TDC and TT opposed the Portrack rebuild. In this case, influential business leaders were involved in public confrontations with councillors, (thus making an interesting news story), and also, business leaders had the appropriate connections to influence local media coverage (Ivan, 1995). Neither of these factors were apparent with the Haverton application and consequently there was little coverage in the press.

The third reason why there was limited public interaction at the planning stage is due to planning requirements. Developers are required to advertise their proposals in several places, principally at the site of the development and in the local papers, they are also obliged to contact local interested parties and hold public meetings. These methods of communication often attract little attention and several developers have run into problems after the planning application has reached its final stages due to limited public involvement at an earlier stage (Petts, 1995). This problem is highlighted by Patel
(1995:5): "Some schemes have visibly failed because of a lack of communication and planning in the development process..."

These problems are beginning to be resolved by developers because it is being increasingly realised that more rather than less public consultation leads to a smoother passage of planning permission. In their best practice guide for EfW the DTI recommend 19 techniques for consulting with the public, from the initial development of the EfW plans, through to the day to day operation of the completed facility (DTI, 1995a). To their credit, when they wanted to re-build at the Portrack site, NEM and CCC produced a brochure pitched at lay understanding. Unfortunately this was not revised and reissued when the Haverton site was proposed, but some community groups in the development area were consulted.

Although there was very limited public discussion of the Haverton EfW scheme, the developers did not attempt a cover-up with the hope that the planning application would pass unnoticed. From the evidence available, it seems that CCC and NEM were willing to go towards a full consultation process if it became necessary. The developers realised, however, that if they avoided excess publicity, while also fulfilling planning obligations then they might move forward with a rapid and smooth planning application. This approach worked, all the relevant parties were contacted and CCC and NEM concluded that "...there were very few objections to the proposals" (O'Rourke, 1996:13).

4.4.3 Landfill

One practice which is central to EC and UK environment policy is the Proximity Principle (PP) and CCC made the express request that the PP be applied in developing a waste strategy for Cleveland. This request led to the development of the 60 acre Carlin Howe Farm landfill at Dunsdale, in the South of the county. The Dunsdale area has had landfill sites for many years and the prospect of an additional site for 14 years was not well greeted by some of the residents.46 The Carlin Howe Farm site has received

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46 Residents living in a row of miners cottages to the West of the site made an unsuccessful attempt to have the planning permission refused.
permission to landfill inert waste, household refuse, incinerator residues, and street
sweepings. This landfill is central to the EfW project as it receives all of the bottom
ash, however, the fly ash is disposed out of the county in Tyneside.

It is estimated that the new EfW plant at Haverton will produce up to 10,000 tpa of
damp fly ash, and up to 60,000 tpa of bottom ash as a result of burning 250,000 tpa of
waste. These ashes are managed separately, and the fly ash is an especially difficult
waste to deal with. Consequently, it is disposed in one of NEM’s special waste landfills
in Tyneside.

On the other hand, bottom ash can be managed in a number of ways. At present bottom
ash from incinerators is landfilled, or used as an intermediary cover on landfill to
prevent light waste blowing away. As a consequence of rising landfill costs, due to more
stringent management requirements and the landfill tax, EfW operators are developing
alternative uses for bottom ash (ETSU, 1996a, 1996b). The main EfW operators in
Britain are developing ash recycling to make a substitute aggregate, and trial plants have
been built at Tysley, SECHP, and Edmonton. If the EfW facility at Cleveland diverts
ash from landfill there could be two main implications, neither of which were raised at
the planning stage. Firstly, ash could be transported further afield, and this could have
impacts on local roads in and around Cleveland. Secondly, ash recycling would release
landfill capacity at Carlin Howe (up to 60,000 tpa), this void could be filled with
commercial waste sourced from within the county, or wastes imported from elsewhere.

4.4.4 The Cleveland Waste Disposal Contract

When CWM were awarded the waste disposal contract in April 1995 they received
several assets from CCC: the staff operating the current disposal operations; the
Portrack incinerator; and several small landfills. The civic amenity sites and waste
collection services are not part of the contract and their operation is controlled by the
UAs. When CCC tendered the disposal contract there were no parameters set for the
length of the contract, other than the need for a “long term” option. As a result, CWM
requested that the contract be set for a 25 year period, CCC were satisfied with this time
The most contentious component of the CWM contract is the ‘must-take’ clause, which is binding for the length of the contract. The “must-take” states that the four UAs must deliver a minimum tonnage of waste to CWM each year consisting of 180,000 tonnes for incineration and 20,000 tonnes for landfill (Thurtle, 1998). The contract contains a penalty clause, and if these tonnage are not met the UAs have to pay CWM compensation, equal to the gate fee per tonne.

The tonnage agreed under the “must-take” component of the contract was calculated by CCC, and at the time of its estimation the UAs felt that the County had overestimated the tonnage (Sherwood, 1996a). This overestimation has come to light within the first year of the contract when the UAs met the incineration tonnage, but fell short of the landfill component (Sherwood, 1997), consequently the four authorities have to pay compensation to CWM for failure to deliver sufficient waste. The four authorities expect this situation to continue in future years, consequently compensation payments are being included in future budgets (Sherwood, 1997). This overestimation of waste arisings is common amongst local authorities and CIPFA (1997:5) believe that nearly all authorities who estimate waste arisings return higher per-capita figures than authorities who weigh waste on collection.
Minimum tonnage 'must-take' clauses are common with long term EfW contracts, both in Britain and the USA, these are necessary for the operators to plan the long term finance necessary for large EfW plants. The concept of 'must-take', and the tonnage of the must-take in Cleveland is discussed later because it raises a number of issues about EfW in Cleveland and elsewhere.

In addition to the gate fee paid by the local authorities, which is set for the length of the contract, CWM will receive additional revenue from the sale of electricity and PRNs. CWM have a NFFO 3 contract to generate 20MW of electricity, this means that they get a preferential access to the electricity market until 2012. In addition, CWM will be able to issue 47,500 PRNs, at current rates\textsuperscript{47}.

Soon after CWM were awarded the disposal contract the construction of the new EfW facility got underway, and details of the company's main landfill at Carlin Howe Farm were finalised. The plant was completed late in 1997 and began burning waste in trials early in 1998, the plant is now fully operational despite some earlier problems with the turbine. Figure 4.5 illustrates the CWM energy from waste facility.

\textit{Figure 4.5 The CWM energy from waste facility}

\textsuperscript{47} Valpak have signed a contract with CWM to purchase PRNs during 1998 (\textit{Vantage}, 1998a). This will generate approximately £1.5m per annum (\textit{Materials Recycling Weekly}, 29.05.98).
4.5 Other waste recovery and disposal in Cleveland

Although the past sections have been concerned with the specific development of the EfW facility at Haverton, other waste strategies have been undertaken at a similar time. Each of the Unitary Authorities are committed to other forms of waste recovery such as recycling and composting, and the main strategies involved are discussed here.

4.5.1 Recycling

CWM do not have any obligations to recycle materials, however, the new incinerator, like Portrack, will recover ferrous metals from the bottom ash with the use of a magnet. This material is then sold to British Steel for reprocessing.

The responsibility for conventional recycling is left with the UAs in their capacity as Waste Collection Authorities, and all four of the UAs have coherent recycling strategies. Stockton, Redcar and Cleveland and Middlesborough UAs operate 'bring' systems with several glass, paper, plastic and metal banks, while Hartlepool UA operates 'bring' and 'kerb-side' recycling schemes. Most of the materials are sold directly to recycling merchants, or are processed through Stockton or Hartlepool’s material reclamation facilities (MRFs). The UAs of Hartlepool and Redcar & Cleveland operate small scale composting schemes, primarily for garden and other green wastes brought to civic amenity sites.

Both Stockton and Hartlepool UAs operate modern MRFs, Hartlepool’s MRF is the bigger of the two, sorting a variety of materials both by hand and mechanically. The MRF at Hartlepool sorts much of the plastic for the county as well as some neighbouring districts, this material is collected by Recoup recycling scheme who organise reprocessing. Although all of the local authorities have recycling strategies in place, the levels of materials recovered remains low. These rates are summarised in Table 4.7.
Table 4.7 Recycling Rates in Cleveland

<table>
<thead>
<tr>
<th>Local authority</th>
<th>Recycling rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hartlepool</td>
<td>4.5%</td>
</tr>
<tr>
<td>Stockton-on-Tees</td>
<td>4.4%</td>
</tr>
<tr>
<td>Middlesborough</td>
<td>2.5%</td>
</tr>
<tr>
<td>Redcar &amp; Cleveland</td>
<td>1.7%</td>
</tr>
<tr>
<td>Average</td>
<td>3.3%</td>
</tr>
</tbody>
</table>


Because the recycling rates are very low, and landfill is an increasingly unviable option, the majority (87%) of Cleveland’s waste is incinerated. This high level of incineration raises an important issue and it was one voiced by the local authorities during the consultation period of the waste strategy. It is likely that the EfW plant and associated minimum tonnage contracts will prevent the authorities from ever attaining their aspirational targets for recycling 25% by 2000. If the authorities were to meet this target and not suffer the costs of the ‘must take’ contract they would need to generate additional waste, because current levels of waste available for recycling (10% landfill plus 3% current recycling) are insufficient. This clearly undermines the objective of the waste hierarchy which aims for waste reduction.

4.5.2 Landfill

In addition to the CWM landfill at Carlin Howe Farm, there are several landfills in Cleveland which are owned and operated by private waste management companies. The majority of these sites are small, however there are two larger sites which are used for household waste disposal. Biffa have a landfill at Dunsdale, very near to the Carlin Howe Farm site and the H.J. Banks here received permission to open a landfill at Haverton.

Waste managers H.J. Banks began to explore the possibilities of opening a landfill in Cleveland in 1992 because at that time the region had a landfill deficit. This exploration led to the purchase of a derelict industrial site from British Steel covering 150 acres and lying to the north east of Haverton (see Figure 4.2). Banks bought the former British Steel site because: “... we had looked at the Cleveland market and the Cleveland area was identified as needing a disposal facility, the Cleveland plan stated there was a
disposal shortage. Cleveland is geographically constrained and needed more capacity, the new incinerator may or may not have been built and as far as we were concerned there was a market" (Munday, 1996). Despite this market, Banks never entered the tendering process for the disposal contract, this means that they will not receive any refuse from the Cleveland authorities. Consequently they expect that of total wastes landfilled, half will be commercial waste and half will be special waste originating from outside the county (Environment Agency, 1996).

A core argument for building an EfW plant in Cleveland was to adhere to the proximity principle and since there was no landfill capacity EfW seemed the best solution. It is ironical that shortly after the JVC formed it came to light that a waste disposal company had plans to establish a 150 acre landfill, with a maximum capacity of 400,000 tpa for fifteen years (Environment Agency, 1996). In addition, the landfill is right in the middle of the county not more than three miles from the Haverton site, in an area where it was claimed that it would be very difficult to find alternatives to incineration for waste disposal (Drabble, 1987). Despite the fact that there were objections from Red Alert, 2000 residents (Summers, 1995), and 400 children (Brayshay, 1995), the H. J. Banks landfill experienced few difficulties in obtaining planning permission from the TDC48.

4.6 Summary

This chapter has described the historical circumstances, both socio-political and industrial, which have shaped Cleveland’s current waste management context. It is clear Cleveland’s industrial heritage has influenced the regional environment and the ways in which local people and organisations interact within the region.

The practise of using already degraded areas for further waste management and disposal, so favoured in the 1970s and 1980s, is a significant contributory factor leading to the recent contested nature of the Cleveland environment. Against this backdrop of tension, some of the least empowered groups have won some of the greatest battles:

48 Red Alert asked the DoE to hold a public enquiry to examine the landfill proposal, but despite the many protestations the DoE refused to call in the plans.
BAND stopped NIREX dumping radioactive waste; STINC prevented toxic incinerators; and Red Alert halted the sale of land by ICI to waste management companies. There is, therefore, a history of local resistance to waste management developments in Cleveland, and the recent past has shown that few planning decisions go uncontested by local groups or movements.

It is therefore surprising that such a key aspect of the region’s waste management strategy in the form of an EfW plant, should meet with so little organised resistance. However, as this chapter has demonstrated, the reasons for this acquiescence are numerous. For example, prior high profile campaigns against a range of waste disposal plans had sapped the energy of many groups to fight further waste disposal plans for a while. Yet this temporary respite occurred at a time which coincided with the planning permission sought by CCC and NEM to build the EfW facility at Haverton. This may explain why many of the more proactive campaigners in Cleveland did not oppose the EfW plans.

Another reason for the lack of local opposition could relate to the relocation of the county’s incineration facility. This relocation of an incineration facility to the CWT has served to consolidate the CWT’s image as an industrial waste zone, yet at the same time it has removed a highly visible industrial activity from a densely populated area of the county. The act of transference of an industrial facility from a built up area to one of existing industrial activity may be an important reason for absence of any organised public protest to the plans.

Further reasons for the relative ease with which the EfW plans were processed could relate to the fact that even an EfW facility may be seen to be a more acceptable waste management option in comparison to further landfill sites. Weight is added to this argument when one considers the fact that local people protested at the proposals to open the H.J. Banks landfill. At the very least, a modern EfW plant could be seen as a vast improvement on the perceived polluting nature of the old Portrack incinerator.

There are also good arguments to support the notion that the inhabitants are ‘punch drunk’ with industrial developments in the region so that any new developments may
seem unremarkable within the Cleveland context. In terms of waste management, it is possible to take this further, by suggesting that over two decades of experience of incineration, as an integral part of waste management in the region, has bred a familiarity and acceptance of such activity, making any new developments such as EfW seem less radical and controversial than they would be in an area without prior experience.

In summary, therefore, this chapter has already demonstrated the variety of scales at which waste management is contested and debated in Cleveland, and the many ways in which these different scales interact to affect the overall outcome of waste management strategies for the region. In particular, the examination of EfW as a key issue in the regional waste management context, serves to open the discussion to the ways in which different groups operate and interact within dynamic social, economic and environmental contexts. The next chapter will outline how the thesis has explored these themes further, through the micro-scale analysis of individual householders.
5. Methodology

5.1 Introduction

One of the key objectives of this thesis outlined in Chapter 1 is to discover the perspectives of householders in Cleveland on the issues of waste and its management. Chapter 2 discussed how this study aims to examine waste management at a variety of related scales using political ecology as a framework, and Chapters 3 and 4 have examined global, national and regional scales, providing a context for examining the micro-scale experience of individuals in Cleveland. However, examining an individual’s experiences of waste and the environment is a necessarily complex task and this chapter describes the methods used in this thesis to uncover such experiences.

Within the adopted framework of political ecology, the understanding of the nested scales of human-environment relationships requires a sound knowledge of human perspectives of the environment at the micro-scale. Much of the work in political ecology has approached this micro-scale using ethnographic techniques (including participant observation), where researchers ‘measure’ both physical and imagined landscapes through an active involvement with their research subjects. In discussing human-environment relations, Pepper (1984), and Blaikie (1994), argue that social perceptions of ‘environment’ often become partially or completely divorced from the actual physical environment. This social construction of the environment may lead observers of environmental issues to misunderstand human-environment relationships, because the partial or complete separation between ‘real’ environments and socially constructed, or imagined environments is ignored, or missed.

This chapter will show how the proposed technique of Q Methodology will try to alleviate some of these difficulties in socio-environmental research, and help to understand the tensions between peoples’ environmental aspirations and their everyday actions, with regard to household waste management. However, it is useful first to consider the common role of ethnographic techniques, particularly in political ecology studies, and to discuss the use and limitations of such techniques.
5.2 Ethnographic Techniques

Ethnography has a long tradition in anthropology, and has recently been used extensively in geographic studies, particularly in the field of political ecology. Political ecology studies typically use ethnographic techniques to provide substantial descriptive discourses of societies which illustrate the ways in which individuals interact with their environment at the micro-scale.

The principal method in ethnography is participant observation, where the observer studies the subjects in their ‘natural’ settings using the subjects’ perspectives as far as possible (Fielding, 1993). A problem with this approach is the protracted period of time needed to enter and become accepted, or at least trusted, by the observed subjects. Yet there are a number of variations on the notion of ethnographic work (Burgess, 1982) and one such variation is ethnographic interviewing, which has adopted aspects of ethnography (Kempton, 1991). The advantage of an ethnographic interviewing technique is its use in “... bridging the gap between the lay person and the scientist in understanding science ... issues” (Kempton, 1991:2). This bridging quality of ethnographic interviewing has been used in different ways elsewhere (Thornton and Garrett, 1995).

5.3 Moving beyond ethnography

While the ethnographic approach provides valuable insights into individual outlooks, the interpretation of such discourses rests with the researcher, and the analysis may simply end at this stage. Kempton (1991), Löfstedt (1993b), and others have used ethnographic interviewing to acquire a final set of data from which to draw some “perspectives” of public opinion. Yet in many ways, the interpretation by the researcher would be more valuable if the individuals could re-examine the essential elements of their original discourse to allow for the confirmation (or rejection) of the attitudes and opinions expressed.

Q Methodology is one such approach whereby the attitudes and opinions are expressed by the individuals, interpreted by the researcher and then re-examined and assessed by the individuals. This type of approach moves the understanding of attitudes from the
inherent subjectivity of the purely ethnographic approach towards greater objectivity on behalf of the researcher (although subjectivity can never be totally avoided). It is partly for these reasons why Q Methodology is used in this thesis and it is now described in detail.

5.4 Q Methodology

Q Methodology (Q) provides this thesis with a key analytical tool which is necessary to explore individual experience to complement the in-depth nature of political ecological research. Through the introduction of Q Methodology this study also serves to broaden the range of analytical tools available in political ecology, which has so far only employed a limited number of social research methods. While ethnographic interviews are maintained in the initial stage of this research, Q Methodology requires that the research subjects 'measure' themselves, to assess each individual's perspectives about waste and the environment. In accordance with the political ecology approach, an individual's experience of their environment needs to be understood in order that they can be situated within the context of the political economy of waste. However, unlike other political ecological studies, the ethnographic technique is used here merely to draw a concourse from the public, so that it can be used as the raw empirical data to draw a Q-sample. The principal quality of Q is that it allows respondents to practice self-measurement, thus resolving any ambiguity of meanings in the process, and hence develop understanding beyond that which is obtained through ethnographic techniques alone.

This is the first time Q Methodology has been employed in a study using political ecology and therefore represents an exploratory and innovative approach. The basic outline of the procedures involved in Q is described next.

5.4.1 Outline of Q Methodology

The basic sequence of techniques used in Q Methodology is outlined below, and then described in detail in later sections.

49 The actual interview discussion with the subjects. See section 5.4.3 for more detail.
Chapter 5: Methodology

Figure 5.1 Elements of Q Methodology

1. This is the main discussion topic which serves to focus the subject's attention. At the Q-sorting stage, this is referred to as the 'condition of instruction'.

2. This is the collection of the issues which are of relevance to the subject under investigation. The concourse does not have to be structured in any way and it can have a broad range of material in it, both at the core and on the periphery of the issue of concern. A concourse is the basis of a Q study and it can be collected from a number of sources, such as newspapers, historical documents, focus groups, in-depth, or ethnographic interviews. The concourse is not limited to words and can also include pieces of art, cartoons, photographs, images, film footage, or pieces of music (Brown, 1993).

3. This is a number of statements reflecting the full diversity of meanings that are apparent in the concourse.

4. A population ("p-set") is randomly drawn from the concourse population, or specific individuals and/or groups can be targeted to capture the broadest variations of meanings. These are then asked to 'sort' the statements from the Q sample according to their strength of agreement with them. This is done using a special sorting board and results in 'Q-Sorts' for each individual.

5. The resulting Q-sorts are factor analysed to reveal factor structures that indicate shared subjective views amongst individuals within the population. These factors can then be rotated to reveal their simple structures.

6. Factors only point to and hint at subjective meanings, consequently, factor meanings need to be interpreted to reveal understanding. This factor interpretation requires a re-examination of the Q-sorts, while various background data that may have been collected during the Q-sorting procedure can also be investigated.

7. Another further interpretative tool is to re-interview those individuals who closely identify with the factors (those with the purest loading).

The use of this technique was piloted on a number of subjects before the majority of respondents were approached. This allowed the identification of a number of problems and their solution. Any such changes are noted in the following sections.
5.4.2 The functional condition

In this study the decision to incinerate waste is central to the functional condition (see point 1 in Figure 5.1). However, the multi-scaled nature of this analysis demands a broader functional framework which includes other means of managing waste and issues about waste management outside of the Cleveland locale. It is important to have a broad but defined functional condition in mind when developing a concourse for a study. This prevents conversations from deviating too far from the issues under discussion while also avoiding the stifling of communications. For the purpose of this study, the functional condition for the development of the concourse is to examine the way in which people view the origins of and management options for household waste from political, environmental, and technological perspectives. These conditions are presented in more detail in the interview guide which is included in Appendix F.

5.4.3 Developing a concourse

The starting point for assessing people's constructions of refuse and the environment lies within their communications, or communication concourses. Brown, (1986:58) states:

"The volume of discussion on any topic is referred to as a concourse (from the Latin concursus, meaning "running together"), and it is these statements of opinion, or ideas that run together in thought, that are the elements of a Q study..." (emphasis original).

Concourses are the raw materials with which Q Methodology works. Here the concourse is of peoples' perspectives of waste and the environment at various scales. A concourse can be obtained from commentaries in the media, literature or written histories, or more commonly through interviews. A communication concourse is what Stephenson calls a "form of communicability [which] is within ourselves and involves our thoughts, feelings, wishes, emotions, opinions and beliefs, our fantasies, dreams - in a word our 'mind'" (1978b:22).

The concourse for this study was obtained through a series of ethnographic interviews (Agar, 1980; Kempton, 1991; Spradley, 1979; Smith et al., 1994; Small, 1995; Hallin, 1995). Ethnographic interviewing techniques were chosen to develop this concourse
because it was realised from an early stage that the general public did not command a depth of knowledge about waste management issues.

Thirty two people were interviewed to develop the concourse. These interviews were taped and later transcribed\textsuperscript{50}. The way in which this sample was derived is discussed below and this also applies to the Q-sorting exercises. Ethnographic interviews followed an unstructured format which adhered loosely to the interview guide (Appendix F). Following Kempton (1991), the interviews consisted of three parts:

1. initial discussion;
2. presentation; and
3. further discussion.

The first section of the interview, which was usually the longest, allowed respondents to discuss almost any aspect of waste, since the opening question was: "What do you understand by waste?". Once the interview was underway the interview guide was used to make sure all the subject areas had been covered. If the respondent ran out of conversation, they would then be asked an open-ended question about one of the issues not raised. Follow-up inquiries were made to aid in the verification of meanings.

The second part of the interview was a presentation. Since this research focuses on the renaissance of waste incineration (in the form of EfW), and acknowledging that the public have a limited knowledge of the processes involved, respondents were given a five minute presentation on EfW and associated management practices in Cleveland. The presentation (Appendix G) was written in the format of a broad sheet newspaper, or magazine article\textsuperscript{51}. The presentation was given to the respondents, and they were invited to interrupt at any stage to ask questions. The purpose of the presentation was to

\textsuperscript{50} The complete transcription of the concourse runs to 166 pages and due to space limitations does not accompany this thesis.

\textsuperscript{51} Pilot research was undertaken to test the interview format, guide and presentation (see below and Appendix F and G). This pilot research was conducted on six randomly selected people in Cleveland and several friends and colleagues. With the exception of the addition of guides on health issues, and an extension of the post-presentation probes, the pilot research indicated that, on the whole, the interview format and guide were rigorous and served to guide the interviews sufficiently well. The presentation required some re-wording mainly to clarify the issues being presented.
provide the respondent with a balanced opinion of waste management strategies. The presentation offered material which was discussed in the third part of the interview when the respondent was probed about the issues raised.

It could be argued that the use of a presentation might affect the interview sufficiently to render it meaningless since respondents might change their minds after the presentation (Löfstedt, 1993b). However, the pilot research indicated that on the whole this was not the case. Generally, people adhered to their pre-presentation arguments, and where they did change their minds this was clear from the taped interviews. Additionally, the interviewer was aware of this possible effect and would ask the respondent to restate their argument if they had significantly changed their views post-presentation. This probing usually made them re-think their original point and consequently provide a more reasoned argument, which considered both their original view and their interpretation of the information provided in the presentation.

5.4.4 Concourse analysis

The next step is to analyse the concourses. Brown (1993:97) explains that concourses "... comprise the raw material of a human science in its subjective respects, and it is frequently at this point that so-called qualitative analyses often break down." The problem with obtaining coherent themes from the raw materials of concourses is difficult, because as most qualitative analyses has shown, the observer resorts to superimposing his or her own categories and frameworks onto the data. This is clearly shown in Figure 5.2 by Fielding (1993:163) when he summarises the means of analysing ethnographic fieldwork:

![Figure 5.2 Ethnographic method (after Fielding, 1993)](image)

Although Q also relies on an artificial categorisation of the concourse, in the form of the Q-sample, the problem of artificial classification is overcome because "...ultimately this artificiality is replaced by categories that are operant, i.e., that represent functional as
opposed to merely logical distinctions" (Brown, 1993:97). What is meant by this is that any artificial categories which are formed to produce a Q-sample are transient before being exposed to the scrutiny of the respondent, when they come to reflect a respondent’s operant subjectivity. Q Methodology, therefore takes the ethnographic approach a step further by demanding that respondents measure themselves using samples from an ethnographically derived concourse.

5.4.5 Eliciting a Q-sample

A Q-sample is a set of statements which are drawn from the concourse, and “... the main goal in selecting a Q-sample is to provide a miniature which, in major respects, contains the comprehensiveness of the larger process being modelled" (Brown, 1993:99). A Q-sample should represent all the major opinions and views covered in the communications of the concourse. It should be noted at this early stage that the production of a Q-sample does not involve reductionist assumptions (Stephenson, 1978b:25), because the statements per se are not used in tests of an objective nature. Rather, the concern in Q is with “... structures, configurations, syntheses of “statements” of a concourse, and ultimately with understandings, not explanations or predictability” (ibid., p.25). Statements, therefore, operate as the interface between the observed and the observer.

The process by which the Q-samples were generated from the concourse (here interview transcripts) was through a distillation of the transcribed ethnographic interviews. After examining the communications of each of the respondents, sections of text were extracted which communicated a particular point, or issue which respondents emphasised52. These communications were then further distilled, with particular statements being extracted which conveyed a particular idea, viewpoint, concept, or ‘feeling’. Some editorial input was required at this stage, although the job of the observer is to interfere as little as possible, and consequently the role was limited to supplying missing nouns, or adding structure to a sentence. Because this task is kept to a minimum, statements may seem ambiguous, sexist, or not politically correct, but it is

52 These sections of text were carefully numbered, so that their original context could be referred back to and each section was saved in an archive computer file.
not the task of the observer to censor statements (Dryzek and Berejikian, 1993). As Brown and Kim put it (1981:113): “The statements, after all, are subjective and matters of opinion, hence are neither right nor wrong.”

The original aim was to generate a single Q-sample which reflected respondents’ views on the origins and management of household waste. However, it soon became apparent that there was an inherent division in respondents’ communications. In discussing refuse, respondents, without exception, communicated strong views on the origins of waste, such as excess packaging and litter while also discussing the management of waste. This distinction lead to the development of two Q-samples reflecting these distinct themes: The “Source” Q-sample is defined by issues relating to the production and sources of waste, and it has 36 items (N = 36). The “Disposal” Q-sample is defined by issues about the environment, disposal and recycling of waste, and has 61 items (N = 61). Separating the concourse into two Q-samples in this way permits a higher degree of specificity in analysis.

At this stage 792 statements had been extracted from the concourse (see Figure 5.3). These numbered statements were then printed on to individual pieces of paper, and it was here that a natural division between the Source and Disposal samples became apparent. A sorting exercise provided 483 statements for the Disposal sample and 309 statements for the Source sample.

These statements were then ordered into topic groups, which corresponded to the subject area of the statement (the aim was to provide a balance of statements in each of the structured categories discussed below). This initial ordering exercise provided 41 and 29 groups, and duplicate statements were then removed from these groups. A final grouping and distillation process provided Q-samples with 63 and 36 respective items for pilot testing. The manual process by which the statements were derived is summarised in Figure 5.3 below.

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53 Any ambiguity which might be apparent in statements is ironed out in the sorting exercise through the way in which subjects place the statement in relation to the others in the Q sort (Dryzek and Berejikian, 1993).
Aside from the Q sorting pilot test, the only other external input to the Q-sample was the addition of statements from non-ethnographic sources. Statements were added to the Disposal Q-sample where an aspect believed to be of importance was not adequately communicated by respondents. In order to maintain a familiar prose, these statements were drawn from local newspapers (*Evening Gazette* and *Northern Echo*). The final statements for each Q-sample are numbered randomly and typed on pieces of card. These cards are then shuffled ready for the Q-sorting exercise, discussed below. The final Q-sample statements are shown in Appendix H.

The Q samples developed here are subdivided into categories summarised in Table 5.1 below. Also shown are the reference numbers of the statements which belong to each category of the structure. The Disposal sample is divided into six categories, while the Source sample is divided into three. The categorisations are produced purely to aid in administration for the interpretative stage of Q and do not hold much significance until the Q-sorting exercise is complete, when these statements then become *operant*, according to the individuals response.
### Table 5.1 Categories of statements from the Disposal and Source Q-samples

<table>
<thead>
<tr>
<th>Sample Group</th>
<th>Topic Category</th>
<th>Description</th>
<th>Q-sample statements in category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposal</td>
<td>Incineration</td>
<td>Statements which refer to people’s views on aspects of EfW facilities, and more general feelings about incineration as a waste management strategy. Statements range from views on electricity generation, to ash disposal, and stack emissions.</td>
<td>8, 10, 14, 17, 24, 26, 27, 31, 39, 46</td>
</tr>
<tr>
<td>Disposal</td>
<td>This is more general, covering a wide variety of waste management methods both past, present, and future. This group includes opinions of disposal technologies, while also offering views on behaviour and waste.</td>
<td>9, 29, 36, 44, 47, 49, 50, 51, 53, 56</td>
<td></td>
</tr>
<tr>
<td>Local</td>
<td>environment</td>
<td>Contains views on the local environment, and how it has changed over time, and may change in the future. Future concerns tend to be focused on issues surrounding NIMBY, while historically the statements suggest that the local environment has improved.</td>
<td>2, 16, 18, 22, 33, 34, 41, 55, 61</td>
</tr>
<tr>
<td>Global</td>
<td>environment</td>
<td>Addresses people’s concerns about the wider and global environment, both in an abstract sense and in relation to MSW. This group also expresses people’s feelings about the environment and environmentalism at a macro-scale.</td>
<td>13, 25, 28, 32, 35, 42, 48, 52, 54, 59, 60</td>
</tr>
<tr>
<td>Recycling</td>
<td></td>
<td>The group includes both people’s views and participation in recycling programmes, and less pragmatic issues about recycling and how it relates to other management options.</td>
<td>4, 7, 19, 20, 21, 30, 38, 43, 45, 57</td>
</tr>
<tr>
<td>Political</td>
<td>economy</td>
<td>Represents those statements that deal with more abstract economic, political and policy issues which surround waste management proposals. As well as the re-appearance of NIMBY, concerns about public accountability and whether or not the council made the best choice for disposal are raised here.</td>
<td>1, 3, 5, 6, 11, 12, 15, 23, 37, 40, 58</td>
</tr>
<tr>
<td>Source</td>
<td>Consumerism</td>
<td>Includes people’s views on supermarkets, often in comparison to traditional grocers and street markets. The broader issues of consumerism, and our throw-away society are also represented, often in relation to the ways in which they influence waste production.</td>
<td>6, 9, 10, 11, 12, 14, 16, 26, 28, 29, 30</td>
</tr>
<tr>
<td></td>
<td>Packaging</td>
<td>Includes statements about packaging, its role as an advertising medium, as a protective material, whether it is all necessary, and how it is related to waste and the environment.</td>
<td>7, 15, 17, 19, 20, 21, 22, 23, 24, 25, 27, 35</td>
</tr>
<tr>
<td></td>
<td>Social change</td>
<td>Represents a broad base of views about the ways in which our society, consumption patterns, and consequent waste, have changed over time. This group includes the changing role of women, the rise of convenience products, and views of ‘green’ products.</td>
<td>1, 2, 3, 4, 5, 8, 13, 18, 31, 32, 33, 34, 36</td>
</tr>
</tbody>
</table>
Choosing a set of respondents - ‘brown’ and ‘green’ sets

Before the Q-sorting exercises can get underway a population of respondents (here called the p-set) is needed. The p-set is divided into two groups. The first is called the “brown” group and comprises the people who participated in the ethnographic interviews which produced the communication concourse. The brown group undertook the Q sorting exercises when the researcher returned to their homes for a second meeting. The other group called the “green” group only participated in the Q-sorting exercises. The brown and green sub-sets were kept separate to determine whether there were significant differences between respondents who had participated at all stages and those who only did the Q-sorts. This outcome of this approach is discussed in Chapter 6.

Q Methodology aims to capture as many diverse opinions as possible, and some researchers favour the use of selective sampling to achieve this. For Brown (1993:95-6) a selective sampling procedure is the norm since “a study of public opinion ... would necessitate interviewing representatives of those segments of the society apt to have something to say about the issue in question”. Yet the time and effort required to capture such diversity makes this difficult. With such a small number of people being interviewed, it was decided that semi-random sampling would enable a better chance of capturing a broad range of opinions in the Cleveland area. This involved choosing electoral wards on a non-random basis so that a geographically representative sample could be obtained, while subjects were selected on a random basis from the chosen wards using electoral registers and random number tables.

Respondents in the brown group were contacted to participate in the ethnographic interviews by means of an introductory letter, which informed people that they would be telephoned in the following few days to be invited to participate in this study. This method was used to avoid “cold” calling which usually results in respondents hanging up. The introductory letter also aimed to avoid upsetting people with security worries, such as old people. After the brown group had been interviewed they were asked if it
would be convenient for the researcher to return to undertake the Q-sorting exercises, and this was granted in almost every case. Some of the green group were recruited to undertake the Q-sorting exercises with a similar introductory letter to that used for the brown group. The remainder of the green group was recruited either through friends of those interviewed in the brown group, ('snowballing'), at a local sixth form college, or at Stockton and Teesside universities. Response rates for both the brown and green groups are shown in Table 5.2.

<table>
<thead>
<tr>
<th>P-set divisions</th>
<th>Number of letters posted</th>
<th>Number agree after phone call</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>brown (interviews)</td>
<td>88</td>
<td>32</td>
<td>36%</td>
</tr>
<tr>
<td>brown (sorting)</td>
<td>N/A</td>
<td>37*</td>
<td>N/A</td>
</tr>
<tr>
<td>green (via letter)</td>
<td>72</td>
<td>31</td>
<td>43%</td>
</tr>
<tr>
<td>Other green</td>
<td>N/A</td>
<td>22</td>
<td>100%</td>
</tr>
</tbody>
</table>

*The numbers between the two brown groups in the p-set do not match because during the ethnographic interviews, couples were interviewed together, and counted as one, whereas the Q-sorting exercises were undertaken with individuals.*

The geographic and socio-economic data which was gathered for this p-set is presented in Chapter 6 where it is used in the factor interpretations. The task now is to explain how the Q-sorting exercises were administered.

### 5.4.7 Q-sorting

Q-sorting is the process whereby respondents model their point of view by ordering the Q-sample stimuli shown in Appendix H (McKeown and Thomas, 1988). The *condition of instruction* is used to focus the Q-sorter’s attention in sorting the Q-sample items.

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54 Three people declined: One could not read, one was out of the country, and the third had poor health.
Chapter 5: Methodology

The condition of instruction

The condition of instruction in this study is a simple request for agreement or disagreement (McKeown and Thomas, 1988). However, it was stressed that the respondent’s judge the cards from their own personal, or subjective perspective. It was apparent that this needed to be stressed, because it is possible to sort the statements from an “ideal world” perspective, since a number of the statements related to “environmental” behaviour which respondents felt that they should participate in - such as recycling waste - even though in reality they did not do so. The condition of instruction is as follows:

From your own personal perspective, and not that of an ideal world view, sort the items according to those with which you most agree, to those with which you most disagree.

Before the Q-sorting exercises were undertaken they were piloted on several people, both in and outside the study site. The pilot research highlighted two problems with the Disposal Q-sample. Firstly, some statements communicated very similar points, and this problem was rectified by eliminating one statement and amalgamating two others. The resultant Q-sample comprised 61 items (Figure 5.3). The second problem was people being inclined to discuss agreeable issues, or present their thoughts in a positive way. A consequence of this was that the concourse provided a wealth of views in an agreeable and positive light. These positive communications meant that there was an imbalance in the sorting exercise with the pilot sorters agreeing with more statements than they disagreed with. To adjust for this imbalance the wording in some statements was changed to reflect a disagreeable, or negative context. The Source Q-sample did not present these problems, and there were few other problems during the pilot test.

During the pilot tests the final task was to complete the background questionnaire (see Appendix J). It was found that by completing the questionnaire last, respondent’s

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55 It was also found that the respondents handled the cards with the items typed on them a great deal, and shuffled them around the form board (Figure 5.2) a lot. These actions were to be encouraged, so bigger (1m by 1.5m) form boards, with sturdier cards were made.

56 A few minor administrative points were also unearthed with the pilot research. Firstly, it was decided to give the green group a short presentation to provide them with an overview of waste management in Cleveland, as awareness of the new incinerator and associated management options was quite low. The green group’s presentation (Appendix 5F) is a shortened version of the presentation used in the ethnographic interviews.
answers were affected, since many of the topics were covered in the Q-sample. To prevent the respondents being primed with answers in this way, the questionnaire was given to respondents before Q-sorting commenced\(^{37}\).

### 5.4.8 The Q-sorting exercises

The Q-sorting exercise, for both the brown and green groups took place in the respondent's home or work place, and was conducted on a one-to-one or small group (maximum 3) basis. The Q-sorting procedure was identical for both groups (apart from the introductory presentation given to the green group). Both groups, therefore, had a similar level of exposure to the issues to be tackled in the Q-sorting exercises, and consequently will be referred to collectively as the p-set.

Two form boards were used to sort the statements in the Q-sorting exercises, one each for the disposal and source Q-samples. The boards were styled as forced normal distributions as shown in Figure 5.4. Forced and free distributions are an issue of contention in Q Methodology, since the argument is made that subjects cannot express their actual views if they are forced to sort the Q-statements in a particular way, especially if it is based on a 'normal' distribution. As Brown (1986:59) points out, however, "... the normal distribution was never conceived as a statistical conclusion to be tested - that is, it has never been argued that people naturally sort statements in this form." The point to having a quasi-normal distribution is to encourage the respondents "... to identify those minority statements about which they felt most strongly and which therefore should play the greatest role in factor interpretation..." (Focht, 1995:134).

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\(^{37}\) The background questionnaire was also piloted at the same time as the Q-sorting exercises, two points were raised. Firstly, the packaging symbols printed on the questionnaire were unclear and too small. Second, problems arose over question 15 which asked about political preference. The wording of this question was difficult because terms such as 'political support' implied that respondents supported the actions of a political party. These problems were easily rectified.
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Figure 5.4 Q sort form boards for the Disposal and Source Q-samples (the vertical ordering of statements is irrelevant)

Disposal Q-sort form board: N = 61

Source Q-sort form board: N = 36

The distribution used here is not part of any statistical hypothesis testing, it is used to encourage the subjects to consider the items more systematically, which is in keeping with the "Law of Error" (McKeown and Thomas, 1988; Brown, 1986). Some research has suggested that forced distributions do not produce significantly different factor arrays from those which are unforced (Brown, 1971; Cottle and McKeown, 1981), and it is the factor arrays which are crucial for the interpretation. The following steps

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38 The Law of Error assumes that there are fewer issues of great importance, than there are issues of less, or no significance. Consequently there are fewer items at the extremes of the form boards.
illustrate the procedure which was used to conduct the Q-sorting, and associated exercises in this study:

1. Respondents in the green group are asked to read the 'green presentation' which gives them an overview of waste management in Cleveland. Respondents from the brown group are asked to think back to the issues which were discussed with them at the previous meeting.

2. The respondent is given the background questionnaire (Appendix J) and asked to complete it in his or her own time. Any queries about the questionnaire are addressed.

3. The subject is now given one of the Q-samples (usually the Disposal sample was dealt with first, since it is the longer of the two), and asked to examine the statements so that they became familiar with them.

4. After the respondents are familiar with the content of the statements they are asked to sort the statements into three piles: one where they agree with statements, one where they disagree and another where the respondent has no feelings for, or is uncertain about statements. The subjects undertake this initial sorting process while thinking about the condition of instruction.

5. After this initial sorting task, the respondents are presented with a Q-sort form board (Figure 5.4). It is then explained how the board is used to rank the statements from -5 (highly disagree), to +5 (highly agree). The respondent is then asked to place the piles of cards on the board - the pile of statements with which they agree going on the right of the board, the pile with which they disagree on the left, and the third pile in the centre of the board.

6. The subject is now asked to look to the right hand pile of cards and is asked to pick out three (one in the Source Q sort) statements with which they most agree and to place them in the corresponding squares (+5) on the board. After these cards are chosen the subject is asked to do the same thing for the three statements with which they most disagree.

7. This right to left process continues until all the cards are placed. It is often the case that the respondent will have, for example, seven items with which they want to rank-order, say under -3. In the event of this, the subject is allowed to leave these items at -3 until the sorting exercise is complete, the subject is then asked to re-examine the whole board and to shuffle the cards around to re-adjust their initial ranking.

8. After the two sorting exercises have been completed the numbers which are printed on each card are recorded on a score sheet, which has the same configuration as the form boards.

Ninety Q-sorting exercises were undertaken, 37 with the brown group, and 53 with the green group. One Q sort had to be discarded because it was incomplete. This resulted
in a total of 89 Disposal Q-sorts and 89 Source Q-sorts. The consequent Q-sorts represent structures of subjective responses for the two Q samples and these models of respondents' perspectives on household waste then need to be factor analysed to see what perspectives are shared by groups of people in the p-set. These common perspectives provide this study with a number of discourses of waste which respondents communicated.

5.4.9 Factor analysis

The next stage in Q Methodology is to subject the Q-sorts to Q factor analysis. This technique, which differs from the more familiar R factor analysis in a number of important ways, needs to be discussed before the results of the analysis are presented.

Q Methodology is concerned with the factoring of persons, and not tests, traits, and the like. This distinction has led critics to assert wrongly that Q method is "...fundamentally and merely "inverted" Q-factor analysis: that it is really nothing more than the application of R method factoring technique to a transposed data matrix..." (McKeown and Thomas, 1988:47). Q factor analysis in Q Methodology gets around this simple transposition, because its concern is with factoring persons, rather than tests or traits. Factoring of persons can take place with Q, because unlike R method, Q Methodology has a common unit of measurement, that of self-significance.

Factor analysis is a method for classifying variables. In R method the variables are tests or traits, in Q method the variables are the Q-sorts (which represents a model of the person who completed the sorting exercise). Factor analysis is key to Q Methodology because it describes the way in which subjects are grouped by assembling commonalities between Q-sorts. A more genuine description of this would be to say that factor analysis reveals the way in which subjects have grouped *themselves*, since Q-sorting is an exercise in self measurement. Factor analysis is a necessary technique because there are so many pieces of information to analyse (Kitzinger, 1989). McKeown and Thomas (1988:50) accurately sum up the purpose of factor analysis in Q:

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59 In the Disposal Q-sample, for example, 89 people provided Q-sort data, and there is 61 statements in each Q-sample. After the initial correlation matrix has been calculated for all 89 sorts, there are 3,916 correlation
"All that the factor analysis does is lend statistical clarity to the behavioural order implicit in the matrix by virtue of similarly (or dissimilarly) performed Q-sorts. Factorisation simplifies the interpretative task substantially, bringing to attention the typological nature of audience segments on any given subjective issue" (McKeown and Thomas, 1988:50).

After factor analysis, the Q-sorts produce a number of factors. Factors represent different perspectives, or groupings of opinions, experiences, beliefs, values and attitudes that the subjects express through the Q-sorting exercises. As Stephenson (1986:53) puts it:

"The factors are operants: Matrices [Q-sorts] are looked at for what the data tell us, not what we project upon them as hypotheses or categorisations."

A factor, therefore, reflects a cluster of subjectivities which exist within a myriad of multiple discourses (Goldman, 1995:13).

The factors rendered using Q Methodology are central to this political ecology because they provide discourses of experience which people communicate at the micro-scale. These discourses communicate both local experience and broader views of waste and the environment. Before these perspectives are introduced it is important to describe the statistical methods which are used to render the factors which are discussed in Chapter 6.

5.4.10 Factor analysis technique

5.4.10.1 Software

Initially, both sets of Q-sorts were entered into QMethod, a software programme written specifically for analysing data derived from Q Methodology. QMethod was designed for smaller data sets than the two 89 respondent groups in this project. This large data set meant that QMethod produced highly correlated factors, it will soon be apparent that this is undesirable. As such, the use of QMethod was terminated and the data was.

coefficients. When this figure is then multiplied by the number of statements (61), it becomes apparent that factor analysis is dealing with a vast amount of data, in this case, 238,876 items.
transferred to SPSS\textsuperscript{60} which can handle larger data sets while producing crisper (less correlated) factors.

5.4.10.2 Correlation Matrix

Before factor analysis can commence it is essential to produce a \( n \times n \) Pearson’s \( r \) correlation matrix, where \( n \) = the number of Q-sorts. All this matrix does is to correlate each Q-sort with each of the others. A correlation matrix shows to what extent each Q-sort correlates with the others. A perfect positive correlation would be measured as \( r = +1.00 \), indicating that the Q-sorts under scrutiny displayed all the statements in the same way. Likewise, a perfect negative correlation would give a correlation of \( r = -1.00 \). However, these perfect correlations are very rare. The correlation matrix is simply a necessary step towards factor analysis which is computed automatically by SPSS and it demands no further attention.

5.4.10.3 Factor analysis

Using SPSS, varimax factor analysis was performed on the \( n \times n \) correlation matrix. In Q Methodology, factor analysis determines how many basically different Q-sorts are present in the matrix. Sets of Q-sorts which are highly correlated with one another and uncorrelated with others have a family resemblance. Factor analysis draws out these different “families” and presents them as factors. As Brown (1993:111) states, “the number of factors is therefore purely empirical and wholly dependent on how the Q-sorters [respondents] actually performed.” In this analysis, a factor will represent those Q-sorters who communicated common discourses on perspectives and experiences of the sources of or management options for household waste. These discourses are multiple and respondents associate with more than one discourse. Factor analysis, however, presents the main discourses, as communicated by the respondents, as factors. These factors are interpreted in Chapter 6.

\textsuperscript{60} In this thesis SPSS (statistics package for social scientists) refers to SPSS for Windows, version 6.1.2.
5.4.10.4 Factor Rotation

All that factor rotation serves to do is to focus these factors, and thus clarify the discourse they represent. In other words factor rotation serves to simplify (but not generalise) the data to aid interpretation. It is not an essential requirement in Q to rotate the factors, although rotation does remove some of the turbidity from the mass of data collected. This resultant clarity makes the interpretation of the factors (Chapter 6) much easier. In some respects factor rotation is like rounding numbers, but because Q is not concerned with quantifying data there is no loss of quality through rotation. Q factor analysis serves to find patterns in the data, and rotation clarifies, but does not change these patterns.

In Q Methodology, two principal methods of rotation are used; judgmental, or hand rotation, and varimax rotation. Varimax rotation is used widely in Q Methodology for achieving a simple structure from the resultant factors and varimax is used in this study.

5.4.10.5 Retention of factors for interpretation

SPSS continues to extract factors until all the variance in the sample is accounted for. A large number of factors can sometimes result, particularly with large p-sets such as the one in this study. In most cases, the first few factors account for a high proportion of the variance and the remaining factors each account for only a few per cent of the variance. In the Source study for example the first four factors accounted for 45 per cent of the variance, but it took another 18 factors to account for all the variance in the sample. Not all 22 factors can be interpreted, and so some have to be discarded and others need to be retained for interpretation.

There are various statistical and judgmental methods for retaining factors for interpretation, although none of the methods has precedence over the others. Statistical methods can miss influential Q-sorters who have a unique perception on an issue (Brown, 1980), while purely judgmental methods could overlook a statistical subtlety.

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61 Stephenson favoured judgmental rotation since it was possible to follow theoretical rather than mathematical criteria.
In Q, a combination of statistical criteria coupled with theoretical consideration has been the norm (Brown, 1980; McKeown and Thomas, 1988).

Here, a combination of significance levels (a level of significance of 0.01 was used) and theoretical consideration are used to determine which factors to retain for interpretation. After this consideration, four factors were retained for interpretation from the Source and three from the Disposal Q-sorting exercises.

5.4.10.6 Factor interpretation

Having made a decision on the number of factors which are to be retained for interpretation there is still a considerable amount of work to be done. As Stephenson (1986:47) states:

"The study is only half complete at this point: One next has to check whether or not the factors really do represent the common conversation modes for the individuals on a factor."

This verification is undertaken by means of factor interpretation. Before factor interpretation can get underway it is necessary to produce a factor matrix and a factor array.

5.4.10.7 'Flagging' defining respondents

In order to produce both the matrix and array it is essential to 'flag' Q-sorts. Flagging involves determining respondents who clearly associate with a particular perspective, or factor. Such people are called 'defining' respondents because they load highly (or cleanly) on a single factor, while loading only slightly on the other factors. For example, the first respondent in the Disposal study (Table 6.6) has the following loadings on the three factors -03, +55 and 00 respectively. These loadings illustrate that this person relates most closely with the second factor, there is little association between this respondent and factors one and three. Respondents 3 and 33 have mixed loadings, defining no single factor, but associating with two and three factors respectively. There
are no null respondents for the Disposal study, consequently everyone associates with one or more of the factors (see Table 6.6).

Factor loadings for each Q-sort can be flagged using either statistical or judgmental methods. Flagging sorts at the 0.01 significance level is a means by which significant loadings (and therefore defining respondents) can be ascertained. Judgement is often needed when using significance levels to flag factors. If a Q-sort is loaded at 0.45 on one factor and 0.40 on another, and the threshold at which a loading is statistically significant lies at 0.44, then the former is significant but the latter is not. In this situation, subjective assessment is required because the Q-sort is not loading cleanly on one factor alone, so the Q-sort would probably not be flagged because it associates reasonably highly with two factors. In another case a Q-sort might only load 0.30 on a single factor, while all the other factor loadings were low, the sort could be flagged.

5.4.11 Factor Matrix

The factor matrix is important for the interpretative task because it points to the defining respondents for each factor. Factors have to be flagged on the matrix to facilitate the computation of a factor array. A factor matrix provides each respondent with a factor loading for each factor. The factor loading “...indicates the degree of association between that person’s individual Q-sort and the underlying composite attitude or perspective of the factor” (McKeown and Thomas, 1988:17). A factor loading of 79 would mean that the respondent is highly associated with the particular factor in question, and factor loading of -79 would mean that the respondent is negatively associated with the perspective offered by the factor. People associated with a given factor, therefore, are assumed to share a common perspective. Some respondents will load purely on a single factor, while others will associate with one factor and have secondary loadings on the other factors.

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62 A null case is not represented by any factor, consequently it is important to keep these cases to a minimum.
5.4.12 Factor Array

Although factor loadings are used to determine defining respondents, the central structure in Q factor analysis is the factor array. In Q, the factor array is computed to illustrate the "intellectual structure" of any particular perspective, or factor (Brown, 1993). A factor array provides each Q-statement with a score for each factor. If for example, there are four factors then four factor arrays will be produced (see Appendix K). Each factor array provides a "typical" Q sort that expresses the "nature" of the factor for which the array has been produced (Kerlinger, 1972). Once the factor array has been produced, the task of interpretation lies with the investigator, who can use the array of statements, the factor matrix and additional information gathered from other activities in the study (discussed below). The complete factor arrays for both samples are shown in Appendix K and L.

5.4.13 Interpretative approach

Other than utilising the factor matrix and the factor array there are no fixed strategies for factor structure interpretation (Brown, 1980:247). Many different approaches can be taken, and Stainton-Rogers (1995:188) suggests that "interpretation may be aided by theory, previous research and/or cultural knowledge." Despite the pivotal role of the factor array, interpretation "...does not simply involve editing and pasting Q statements, but more importantly combining them in an internally coherent manner" (Ka Ying Wong and Tung Wen Sun, 1995:11).

A number of different information sources were used in addition to the factor matrixes and arrays in interpreting the Source and Disposal factors. Firstly, the ethnographic interviews discussed earlier were conducted with over a third of the people who performed Q-sorts. These interviews were in-depth and usually took place in respondents' homes. As a result of these interviews a depth of experience about these people was gained. This experience was learned from the interviews and as a result of experiencing their domestic context. Abstracts of the discourse from these interviews are used in the interpretations both to verify the interpretations. Secondly, formal

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63 Readers who are conversant with discourse analysis might argue that if the original communication concourse is used to interpret respondents' perspectives then the whole endeavour of Q is futile. This criticism can be
information was gathered from the questionnaire which was completed by every respondent. Finally, the researcher has a long standing cultural connection to the Northeast of England and an in-depth knowledge of the issues surrounding household waste, both in Cleveland and Britain\(^4\).

It is possible for the researcher to interpret incorrectly the operant type communicated in the resultant factors, and so it is common practice to verify factor interpretations. The simplest way to verify interpretations is for the researcher to present his or her interpretation to respondents to see if the researchers interpretation adequately reflects the respondent’s own perspective. A number of defining respondents in this study were contacted by telephone to verify my interpretations of the factors. Few changes were required, and these have been incorporated into Chapter 6 and warrant no further discussion.

5.4.14 Critique of Q

Like all social research methods, Q is open to a number of criticisms. A number of these, however, have been based solely on misinterpretations of Q Methodology. These misinterpretations have been debated extensively elsewhere and it is unnecessary to revisit them here. Further discussions can be found in Stephenson, (1953); McKeown and Thomas, (1988); Gould, (1985); and Brown, (1980 and 1993). However, a number of valid criticisms of Q Methodology can be made. Firstly, the central assumption in Q is that people can effectively communicate their perspectives, feelings and experiences. While communications are central to most people’s lives, there are great differences in the ability to communicate, particularly when complex scientific and technical issues are at stake. While this is a valid criticism, it is not unique to Q and rather it is a general problem with social research. However, the ethnographic interviewing technique used countered because the objective of the Q method is to render perspectives which the respondents themselves have been responsible for measuring with the Q sorting exercises. Once these perspectives have been attained a concourse can be reintroduced to firstly verify interpretations, and then to illustrate the perspective with more vigour.

\(^4\) Initially a local authority database called INFOS was to be used to obtain information on social and economic welfare indicators for relevant Electoral Wards in Cleveland (see Chapter 4). After factors were abstracted it was found that the geographic trends were so vague it rendered INFOS, which deals with quite large areas, ineffectual.
here tried to address some of the problems experienced by the public in explaining technical and complex issues.

A second criticism relates to the introduction of researcher bias during the formation of short Q statements from a lengthy communication concourse. A case can be made for this criticism, but attempts are made to reduce the editorial role of the researcher. Despite this, the critique can be discredited because the sample is not regarded as reflecting the respondent’s subjectivity until it has been sorted. Any ambiguity or ‘researcher bias’ is then lost in the sorting exercise which requires the participant to sort statements under their own terms of self-reference.

Thirdly, Q assumes that respondents are sufficiently organised to express themselves in the Q sorting process. The Q-sorting exercises do take time and require a degree of concentration and organisational ability. For some respondents, the Q sorting exercise could prove too taxing, and consequently respondents might not sort the cards in a way which accurately reflects their opinions at that time. This is sometimes the case, but the researcher is always on hand to resolve any confusion when the sorting is taking place.

A fourth criticism relates to the relevance of Q Methodology. Since the method is based on semi- or non-random and small samples of the population; it is argued that Q has no salience as a method for obtaining a representative understanding of a population. This criticism is easily defended. Non-random sampling techniques are used because Q serves to find as many different and diverse discourses about a topic as there are in a population. Random sampling could, therefore, lead to discourses being under-represented, whereas non-random sampling serves to find as many different discourses as possible. Small samples are justified in Q because it is an intensive method which serves to discover different, and Q does not aim to find out how many people have such views.

A fifth level of criticism relates to the context of examination and how this changes with time. If, for example, the p-set are asked to undertake the same Q sorting exercises on three occasions over the duration of a month, different discourses about waste might emerge. This, however, is an inevitable consequence of any social research which can
only provide a 'snapshot' of respondents' opinions of an issue. The fact that different discourses are produced over time is often the basis of intensive Q studies where a small p-set are asked to undertake the sorting exercises many times.

5.5 Summary

This chapter has explained the methodology to be used to try and discover the environmental perceptions, attitudes and values of householders in Cleveland with regard to waste management. Since political ecology has been adopted as the guiding analytical framework for this thesis, the methodology adopted needs to try and discover the perspectives of the individual, so that the complex interrelationships can be understood between their attitudes and actions and the wider political economy of waste management.

It has been shown that the methodological core in political ecology has traditionally drawn on ethnographic techniques, notably participant observation. These techniques assess perspectives on a qualitative basis, rather than quantifying the numbers of people with certain types of view. Discovering what types of local perspectives exist, rather than how many people have these perspectives is important for contextualising the character of local discourse within a broader political economy.

While the chosen approach of Q Methodology retains ethnographic elements in its earlier stages, Q Methodology attempts to take the process of analysis one step further by involving the participants in the assessment of their own discourses. This lends a degree of clarity and authenticity to the eventual interpretation of their discourses, and goes some way to reducing the introduction of researcher bias. Furthermore, Q Methodology allows researchers to uncover a variety of discourses about the ways in which people experience their environment at the micro-scale, revealing the plurality of environmental perspectives. These qualities of Q Methodology will become apparent in the next chapter.
Q Methodology is a particularly useful tool to use in this study when the complexity of the Cleveland context is considered. As Chapter 4 illustrated, Cleveland is a compact region hosting a great deal of heavy and associated industries. A consequence of this industrial economy is the tendency to make residents 'punch drunk' with further developments, such as EfW incinerators. Q enables respondents to exhibit their attitudes to waste management in the Cleveland context in a multitude of ways through the Q-sorting procedure, despite the complex milieu of the region.

As an extension of the traditional use of ethnographic techniques, this thesis will use Q Methodology to try and broaden the range of analytical tools available within political ecology research. Political ecology is itself a relatively young field which is constantly evolving, and this thesis is an appropriate opportunity to experiment with different techniques which may further enhance the understanding of human-environment relationships.
6. Discourses of Waste in Cleveland

6.1 Introduction

Chapters 3 and 4 illustrated changing attitudes towards the environment, domestic refuse composition, waste management practices and the increasing politicisation of household waste. These changes are quite straightforward to analyse because they are generally communicated through standard protocols. However, assessing individuals’ perspectives on domestic refuse is a more difficult task because individuals have perspectives of waste and the environment which are conditioned by many factors particular to their context. Respondents’ perspectives, therefore, are place-based and are dependent on a multitude of environmental, social, cultural, political and economic stimulants. While the results are presented in detail in this chapter, the significance of the results are discussed in the following chapter, drawing on the central themes of political ecology to elucidate the way local discourses interact with the other scales of analysis addressed in this thesis.

Chapter 5 discussed Q Methodology and its role in this thesis, and this chapter presents the resulting discourses on waste and environmental perceptions among householders in Cleveland. This chapter proposes that there are several discourses which are evident among the residents of Cleveland, and these discourses are represented by the factors which were rendered from the two Q studies (Source and Disposal) discussed in the previous chapter. Each factor represents different perspectives on waste and environmental issues which were communicated by the respondents in both studies. However, it should be noted that the particular categories into which respondents are grouped are not mutually exclusive, since there will be a certain amount of overlap, but rather it is intended that such classifications will emphasise the stronger common elements between groups of respondents. These common elements will be reflected in the labels used to describe each group for each study. Before the results of each study are given, some points must be made regarding the use of the ‘Green’ and ‘Brown’ respondent sets.
6.1.1 The ‘green’ and ‘brown’ respondents

The brown/green distinction was designed to see if there were any perspectives unique to either the brown or green groups. The investigation required to determine this was relatively straightforward. According to the method discussed in Chapter 5, both the green and brown respondents were factor analysed together. To test for unique perspectives the brown and green respondents are factor analysed separately (two factor analyses each for the Source and Disposal samples). Using the Disposal sample as an example, three factors each for the two Q samples resulted: A, B, C (brown) and X, Y, Z (green). Three factor arrays for each of these groups were produced. These factor arrays were then entered into a second order analysis (in the same way that a form board sorted by a respondent would be entered). The second order factors then indicated to what extent brown factor A was factorially similar to the green factor X, and B similar to Y, and C to Z. The results from this analysis indicated that there were no significant differences, and no unique perspectives in either the brown or green groups in the p-set. In light of this similarity the interpretations presented here will discuss the two groups as a single population for both the Source and Disposal samples.

6.2 Interpretation of the Source factors

Respondents’ views on the sources of waste exhibit a high degree of specificity, meaning that many factors were generated with only a few people relating to each factor. The four factor solution derived for the Source study accounts for only 45 per cent of the variance. However, it provides a reasonable degree of explanation for the Source sample when the high degree of specificity is taken into consideration (it also keeps the number of unexplained perspectives to a minimum of two). Table 6.1 illustrates the groups of respondents who define each of the four factors extracted. After statistical and theoretical consideration of the four factor solution, 17 respondents define the first factor, 18 the second, 17 the third, and 16 the fourth as shown by the grey columns in Table 6.1. Nineteen of the remaining 21 participants have mixed loadings, and two have perspectives which are unexplained by this factor analysis.
### Table 6.1 Rotated factor matrix for the Source sample

<table>
<thead>
<tr>
<th>Q-sort</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Q-sort</th>
<th>Factor 1</th>
<th>Factor 2</th>
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<th>Factor 4</th>
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<td>17</td>
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</tr>
</tbody>
</table>

x = defining respondent; z = respondent with mixed loading; n = null case
Chapter 6: Discourses of Waste in Cleveland

In the following interpretations each factor is described in terms of a coherent discourse and this is reflected in the labels given to these discourses\(^6\). Numbers in parentheses refer to the respective sample statements, this enables the reader to refer back to the complete factor array included in Appendix K. The following interpretations are based on the intellectual structures presented in the factor arrays, the original communication concourse and interpretation verification. As stated above, these groups represent the stronger common elements of discourses given by the respondents, and the groups are intended to show the range of beliefs and attitudes rather than rigidly classify individuals to any one group exclusively. The names given to each of the factors indicate the discourse which that factor represents. These interpretations are derived from defining respondents (Chapter 5). People who define particular discourses are referred to by the discourse name. For example, people who clearly associate with the Contra-consumer discourse are called Contra-consumers.

6.2.1 Factor One - “Contra-consumers”

The sixteen respondents who define this factor emphasise fundamental sources of waste, such as consumerism and our ‘throw-away’ society, and can therefore be labelled as “Contra-Consumers”. The respondents who positively define this factor contemplate sources of waste from a broad platform, they are unsure of the wisdom of our current consumer led society, arguing that progress does not have to result in increased consumption (30). In contrast to factor three, respondents communicate the belief that people are often pressurised to purchase new products, even if the new product is unnecessary (26). This pressure to consume more is driven through advertising which itself leads to more waste (22). While large companies like Sainsburys and Asda could do something to reduce the sources of waste, defining respondents feel they never will because these companies have more interest in profit than the welfare of society or the environment (11).

\(^6\) The use of such labelling to describe broadly homogenous groups has been used in other studies. For example, Rayner and Cantor (1987) use four categories of people or ‘constituencies’ to examine the role of social relations in defining social environmental risks. These were Competitive/Market, Atomised Individual, Bureaucratic/Hierarchical and Egalitarian.
Those statements which relate to the fundamental sources of refuse, such as consumerism, are at the forefront of this factor. However, secondary emphasis is placed on the packaging associated with products. Although people relating to this factor cook in a traditional manner, avoiding ready-meals (3), they still feel that there is excessive packaging on products. Contra-consumers would be happy without this excessive packaging (24). Respondents question whether the purpose of packaging is for increasing product sales or, as manufacturers claim, protecting the product (16). Even if packaging, such as plastic, keeps a product clean and hygienic Contra-consumers question its use if it results in harm being done to the environment (35). The following excerpt from the interview with participant eleven illustrates this dislike for packaging:

"Everything now you use, in modern day is made to throw away, so the actual refuse has tripled, I would say, over the last 10 years, for the simple reason you are throwing away everything you buy, your packaging, and like before when you had the paper bags you used to save them and re-use them for something else, like sandwich bags for work. You don't even get that now."

Defining respondents’ perspectives on the excessive usage of packaging are illustrated in Table 6.2 which gives their answers to questions one and three on the background questionnaire.
Table 6.2 Contra-consumers background information and answers to Questions 1 and 3

<table>
<thead>
<tr>
<th>Q-sort</th>
<th>Question 1</th>
<th>Question 3</th>
<th>Sex</th>
<th>Job/income</th>
<th>Age</th>
<th>Politics</th>
</tr>
</thead>
<tbody>
<tr>
<td>B10</td>
<td>Vegetable peelings</td>
<td>Pre-packed food</td>
<td>F</td>
<td>10-15K</td>
<td>50-59</td>
<td>Lib Dem</td>
</tr>
<tr>
<td>B11</td>
<td>N/A</td>
<td>All shopping</td>
<td>M</td>
<td>10-15K</td>
<td>50-59</td>
<td>Labour</td>
</tr>
<tr>
<td>B26</td>
<td>Tins, bottles, jars</td>
<td>Tinned food, jars</td>
<td>M</td>
<td>Retired</td>
<td>70+</td>
<td>Cons</td>
</tr>
<tr>
<td>G49</td>
<td>Tins, plastic packaging</td>
<td>N/A</td>
<td>F</td>
<td>&lt;10K</td>
<td>20-29</td>
<td>Labour</td>
</tr>
<tr>
<td>G52</td>
<td>Excess packaging</td>
<td>Fast food</td>
<td>F</td>
<td>Student</td>
<td>&lt;20</td>
<td>Cons</td>
</tr>
<tr>
<td>G57</td>
<td>Paper and glass</td>
<td>Most things!</td>
<td>F</td>
<td>10-15K</td>
<td>20-29</td>
<td>N/A</td>
</tr>
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<td>N/A</td>
<td>M</td>
<td>10-15K</td>
<td>30-39</td>
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<td>Plastics</td>
<td>N/A</td>
<td>M</td>
<td>Student</td>
<td>&lt;20</td>
<td>Lib Dem</td>
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<td>Plastic bottles, glass, paper, food</td>
<td>Packaging on food &amp; household goods</td>
<td>F</td>
<td>Inc.</td>
<td>20-29</td>
<td>Lib Dem</td>
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<td>Food packaging</td>
<td>Food &amp; drink</td>
<td>F</td>
<td>Student</td>
<td>20-29</td>
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<td>Drinks</td>
<td>F</td>
<td>Retired</td>
<td>60-69</td>
<td>Cons</td>
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<td>Bottles, fast food</td>
<td>F</td>
<td>Student</td>
<td>20-29</td>
<td>Lib Dem</td>
</tr>
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<td>F</td>
<td>Student</td>
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<td>Student</td>
<td>&lt;20</td>
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<td>Tins &amp; glass bottles</td>
<td>F</td>
<td>Student</td>
<td>&lt;20</td>
<td>Labour</td>
</tr>
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<td>G81</td>
<td>Food</td>
<td>Glass bottles</td>
<td>M</td>
<td>Student</td>
<td>&lt;20</td>
<td>Labour</td>
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<td>None I am aware of</td>
<td>F</td>
<td>10-15K</td>
<td>30-39</td>
<td>N/A</td>
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</table>

Table 6.2 indicates that most of the people defining this factor are students or people earning £10,000 - £15,000 only two respondents are retired and one of these defined the factor negatively (respondent 26). While a number of the participants in this study indicated a preference for the Green Party and socialism none of them defined this factor, which is surprising since it emphasises the need to reduce consumption. All the other factors have been defined by one or more Green Party supporter, but factor two has the highest proportion of people preferring non-main-stream political ideologies. Contra-consumers tend to have a liberal political perspective; four support the Liberal Democrats, four Labour and two the Conservatives.

6.2.2 Factor Two - "Source Reducer"

While factor one places most emphasis on the fundamental sources of waste, such as consumerism, this factor places least importance on statements relating to consumerism.
More significance is given to statements which relate to the tangible sources of waste, such as packaging and how this has led to changes in the types of refuse generated. As such, the people who define this factor can be referred to as “Source Reducers.”

The emphasis placed on packaging is borne out by the belief that packaging is in excess and much of it is unnecessary (7). Respondents perceive that more working women contribute to waste because of convenience and ready meals (2) which results in more waste (24). Much of this excess is paid for by the consumer since it is assumed that packaging increases the price of a product (20). Similarly, packaging is perceived as having an environmental impact, such as the destruction of forests (27). This situation could change because respondents feel that large companies such as Sainsburys and Asda could reduce their profit margins slightly to improve society and the environment (11). The following excerpt from the interview with participant 32 further illustrates the perspective communicated in this factor:

“[supermarkets] over package things, like I bought 4 big bottles of water that are all held together in plastic and they are in plastic bottles anyway, and there are plastic bags all over for you to put things in. It depends what you are getting, but some things you do need to put together in something, but you can resist putting everything into plastic bags, you can try.”

Source Reducers’ concern for the price of products is borne out by the fact that they tend to buy the cheapest goods (13). Consumer power as a driver for environmental protection does not impress these respondents who buy the cheapest on offer regardless of the environmental consequences (32). This perspective is confirmed by the following statement from the interview with respondent 13:

“some eco-friendly products are available but they are often more expensive. When people do their shopping they make economic decisions and go for the cheap ones.”

Source Reducers illustrate an important dilemma between economic and environmental choice. Table 6.3 illustrates that respondents 13, 23, and 75 support the Green Party or socialism. This factor has the highest concentration of respondents who support the Greens, yet they emphasise that they buy the cheapest on offer. While respondents might be environmentally, or socially sympathetic they are bounded by economic constraints and often buy the cheapest, and possibly more environmentally deleterious products.
Table 6.3 Source Reducers background information and answers to Questions 1 and 3

<table>
<thead>
<tr>
<th>Q-sort</th>
<th>Question 1</th>
<th>Question 3</th>
<th>Sex</th>
<th>Job/income</th>
<th>Age</th>
<th>Politics</th>
</tr>
</thead>
<tbody>
<tr>
<td>B13</td>
<td>Clothes</td>
<td>Food</td>
<td>M</td>
<td>Student</td>
<td>40-49</td>
<td>Socialist</td>
</tr>
<tr>
<td>B14</td>
<td>Packaging</td>
<td>N/A</td>
<td>M</td>
<td>25K+</td>
<td>50-59</td>
<td>Cons</td>
</tr>
<tr>
<td>B17</td>
<td>Waste food, peels</td>
<td>Food, wrapping</td>
<td>F</td>
<td>10-15K</td>
<td>50-59</td>
<td>Labour</td>
</tr>
<tr>
<td>B18</td>
<td>Food packaging</td>
<td>Pre-packed goods</td>
<td>F</td>
<td>&lt;10K</td>
<td>50-59</td>
<td>N/A</td>
</tr>
<tr>
<td>B19</td>
<td>Plastic, packaging</td>
<td>Food packaging</td>
<td>M</td>
<td>10-15K</td>
<td>50-59</td>
<td>N/A</td>
</tr>
<tr>
<td>B20</td>
<td>Plastic</td>
<td>N/A</td>
<td>F</td>
<td>10-15K</td>
<td>30-39</td>
<td>Labour</td>
</tr>
<tr>
<td>B23</td>
<td>Plastics</td>
<td>Food miles</td>
<td>M</td>
<td>&lt;10K</td>
<td>50-59</td>
<td>Green</td>
</tr>
<tr>
<td>B24</td>
<td>Paper</td>
<td>Food, wrappings</td>
<td>F</td>
<td>Nun</td>
<td>50-59</td>
<td>N/A</td>
</tr>
<tr>
<td>B32</td>
<td>N/A</td>
<td>N/A</td>
<td>F</td>
<td>10-15K</td>
<td>50-59</td>
<td>N/A</td>
</tr>
<tr>
<td>B34</td>
<td>Tins, lard</td>
<td>Newspapers, junk mail</td>
<td>M</td>
<td>Retired</td>
<td>30-39</td>
<td>N/A</td>
</tr>
<tr>
<td>B36</td>
<td>Packaging</td>
<td>Jam tarts, milk, frozen food</td>
<td>M</td>
<td>10-15K</td>
<td>20-29</td>
<td>Labour</td>
</tr>
<tr>
<td>G48</td>
<td>Food and plastics</td>
<td>Cans and bottles</td>
<td>F</td>
<td>Student</td>
<td>30-39</td>
<td>Labour</td>
</tr>
<tr>
<td>G51</td>
<td>Plastic bags</td>
<td>N/A</td>
<td>F</td>
<td>Student</td>
<td>20-29</td>
<td>Labour</td>
</tr>
<tr>
<td>G54</td>
<td>Glass, paper</td>
<td>Newspapers, magazines</td>
<td>F</td>
<td>Student/Mum</td>
<td>30-39</td>
<td>Lib Dem</td>
</tr>
<tr>
<td>G68</td>
<td>Waste food, peels</td>
<td>Multi wrappings</td>
<td>F</td>
<td>Nun</td>
<td>40-49</td>
<td>N/A</td>
</tr>
<tr>
<td>G70</td>
<td>Glass &amp; paper</td>
<td>Most things from supermarkets</td>
<td>F</td>
<td>Student</td>
<td>20-29</td>
<td>N/A</td>
</tr>
<tr>
<td>G75</td>
<td>Plastics (one-use)</td>
<td>General packaging</td>
<td>M</td>
<td>&lt;10K</td>
<td>40-49</td>
<td>Green</td>
</tr>
<tr>
<td>G86</td>
<td>Glass bottles</td>
<td>Convenience foods</td>
<td>M</td>
<td>Student</td>
<td>30-39</td>
<td>Labour</td>
</tr>
</tbody>
</table>

As with the other defining respondents, packaging dominates Source Reducers’ perspectives on the sources of excessive waste (see Table 6.3). Although respondents feel that from the consumers point of view some packaging is necessary (16) the perception is that it is used excessively on most products (24).

6.2.3 Factor Three - “Historical Commentator”

Unlike the other factors, respondents defining this factor clearly recognise and associate with social change and the implications it has on the sources of household waste. In other words, they are able to offer a historical overview to the changes in society and can therefore be labelled ‘Historical Commentators’. This perspective of change is illustrated in the following statement from the interview with respondent 35:
"At one time everyone used to have their milk delivered in bottles which were used again and again. Now everyone buys their milk in the supermarkets in these huge plastic containers which are just thrown out, you can’t recycle them."

These people have moved away from traditional cooking and have taken advantage of convenience foods, mainly because of their quickness (18). In contrast to factor two, these people do not shop for the cheapest product, instead they prefer to buy convenience foods which are typically more expensive (13). These respondents are also prone to shop with their eyes, buying a product if it is attractively packaged (36).

Despite their vulnerability to attractive packaging, Historical Commentators emphasise that packaging is unnecessary from a practical perspective, but it is used to make a product look better (16). Even if the package is not needed for the protection of goods, respondents believe it would still be present for the purposes of advertising (22). This concern for the excessive usage of packaging extends to the wider environment since respondents would prefer it if environments such as forests were not destroyed to make packaging (27). Concern for the excessive usage of packaging is illustrated in Table 6.4 which gives Historical Commentators responses to questions one and three.
Chapter 6: Discourses of Waste in Cleveland

Table 6.4: Historical Commentators’ background information and answers to Questions 1 and 3

<table>
<thead>
<tr>
<th>Q-sort</th>
<th>Question 1</th>
<th>Question 3</th>
<th>Sex</th>
<th>Job/income</th>
<th>Age</th>
<th>Politics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“Of the things that you throw out, which do you feel is the most wasteful?”</td>
<td>“If any, which products do you buy where there is excessive waste?”</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B01</td>
<td>Glass</td>
<td>N/A</td>
<td>F</td>
<td>Retired</td>
<td>60-69</td>
<td>N/A</td>
</tr>
<tr>
<td>B16</td>
<td>Food</td>
<td>Packaging</td>
<td>M</td>
<td>10-15K</td>
<td>60-69</td>
<td>Labour</td>
</tr>
<tr>
<td>B27</td>
<td>Packaging</td>
<td>Fresh vegetables</td>
<td>M</td>
<td>Retired</td>
<td>70</td>
<td>Lib Dem</td>
</tr>
<tr>
<td>B29</td>
<td>N/A</td>
<td>Fresh vegetables</td>
<td>F</td>
<td>Retired</td>
<td>60-69</td>
<td>N/A</td>
</tr>
<tr>
<td>B30</td>
<td>Newspapers</td>
<td>N/A</td>
<td>M</td>
<td>Retired</td>
<td>60-69</td>
<td>Labour</td>
</tr>
<tr>
<td>B35</td>
<td>Glass &amp; plastic</td>
<td>Plastic milk boxes</td>
<td>F</td>
<td>10-15K</td>
<td>50-59</td>
<td>N/A</td>
</tr>
<tr>
<td>G38</td>
<td>Food cartons and tins</td>
<td>N/A</td>
<td>M</td>
<td>Retired</td>
<td>70+</td>
<td>None</td>
</tr>
<tr>
<td>G42</td>
<td>Paper etc.</td>
<td>Cardboard boxes like soap powders</td>
<td>M</td>
<td>Retired</td>
<td>60-69</td>
<td>Lib Dem</td>
</tr>
<tr>
<td>G43</td>
<td>Plastic, paper, tins</td>
<td>Papers, plastics</td>
<td>M</td>
<td>Retired</td>
<td>50-59</td>
<td>Labour</td>
</tr>
<tr>
<td>G46</td>
<td>Packaging</td>
<td>Milk, phone books</td>
<td>F</td>
<td>N/A</td>
<td>50-59</td>
<td>Labour</td>
</tr>
<tr>
<td>G56</td>
<td>Cardboard and paper</td>
<td>Ready and frozen meals</td>
<td>F</td>
<td>Retired</td>
<td>60-69</td>
<td>Cons</td>
</tr>
<tr>
<td>G61</td>
<td>Paper, cans, plastic</td>
<td>Food</td>
<td>F</td>
<td>&lt;10K</td>
<td>20-29</td>
<td>Labour</td>
</tr>
<tr>
<td>G65</td>
<td>Paper &amp; cardboard</td>
<td>Packaging</td>
<td>M</td>
<td>Retired</td>
<td>70</td>
<td>Labour</td>
</tr>
<tr>
<td>G67</td>
<td>Everything, except the human race</td>
<td>Coloured plastics, waxed cartons</td>
<td>F</td>
<td>N/A</td>
<td>30-39</td>
<td>Green</td>
</tr>
<tr>
<td>G73</td>
<td>Carton packaging</td>
<td>Cereals</td>
<td>F</td>
<td>&lt;10K</td>
<td>40-49</td>
<td>N/A</td>
</tr>
<tr>
<td>G85</td>
<td>Paper</td>
<td>Food packaging</td>
<td>F</td>
<td>Housewife</td>
<td>30-39</td>
<td>Labour</td>
</tr>
<tr>
<td>G88</td>
<td>Paper and cans</td>
<td>N/A</td>
<td>M</td>
<td>20-25K</td>
<td>30-39</td>
<td>Cons</td>
</tr>
</tbody>
</table>

Table 6.4 illustrates that the majority of people associating with this factor are retired, consequently they have a historical perspective of change. This perspective is communicated throughout the factor because Historical Commentators have more to declare on the changes they have experienced personally than the environmental issues they are exposed to through the media.

Explanation for Historical Commentators’ perspectives on consumerism can also be gained from the age profile of the respondents. Although people associating with this factor suggest they are prone to advertising on fancy packaging, they do not believe that people are encouraged to replace products before the old one has worn out. A possible explanation for this is the maturity of Historical Commentators, many of whom were educated to “make do and mend” and not buy new products until the old one is beyond repair. In short, older people tend to be more frugal (DeYoung, 1986). This
6.2.4 Factor 4 - "Consumer"

In contrast to Contra-consumers, this factor communicates the perspective that progress, or development is about consuming more and having more goods (30), and as such can be simply labelled as "Consumers". In the following discourse, respondent nine airs his perspective on the increased consumption of goods:

"We eat and drink much better now than we used to and as a consequence we have more waste, wine bottles, beer and lager cans are an everyday occurrence now... I agree with environmental issues, but if you are selling something expensive, you put expensive packaging on it to enhance the look of your product, but environmentally it is a waste of resources."

This consumer perspective is emphasised at a broader level when people associating with this factor emphasise that as a consequence of increased affluence we have become a consumer society which in turn has lead to increased waste (29). This consumerism is driven through encouragement to replace products with the latest model even if the old one has not broken (26). On the whole respondents defining this perspective have higher incomes and consequently they communicate that they purchase better quality goods (13, 32). These goods are typically bought from supermarkets and getting to the supermarket usually involves a car journey (9). People defining this factor are the most affluent compared with people associating with other factors, this is illustrated in Table 6.5.
Table 6.5 Consumers background information and answers to Questions 1 and 3

<table>
<thead>
<tr>
<th>Q-sort</th>
<th>Question 1</th>
<th>Question 3</th>
<th>Sex</th>
<th>Job/income</th>
<th>Age</th>
<th>Politics</th>
</tr>
</thead>
<tbody>
<tr>
<td>B02</td>
<td>Packing</td>
<td>N/A</td>
<td>F</td>
<td>N/A</td>
<td>40-49</td>
<td>Labour</td>
</tr>
<tr>
<td>B04</td>
<td>N/A</td>
<td>N/A</td>
<td>F</td>
<td>10-15K</td>
<td>40-49</td>
<td>Labour</td>
</tr>
<tr>
<td>B05</td>
<td>N/A</td>
<td>Toilet goods, excess packaging</td>
<td>M</td>
<td>Retired</td>
<td>60-69</td>
<td>Cons</td>
</tr>
<tr>
<td>B07</td>
<td>Food</td>
<td>Fancy packaging</td>
<td>M</td>
<td>15-20K</td>
<td>20-29</td>
<td>Labour</td>
</tr>
<tr>
<td>B09</td>
<td>Food scraps</td>
<td>N/A</td>
<td>F</td>
<td>10-15K</td>
<td>50-59</td>
<td>Cons</td>
</tr>
<tr>
<td>B21</td>
<td>Plastic packaging</td>
<td>Ready made meals</td>
<td>F</td>
<td>Retired</td>
<td>50-59</td>
<td>Cons</td>
</tr>
<tr>
<td>B22</td>
<td>N/A</td>
<td>N/A</td>
<td>M</td>
<td>Retired</td>
<td>60-69</td>
<td>N/A</td>
</tr>
<tr>
<td>B33</td>
<td>Glass bottles</td>
<td>Plastic razors</td>
<td>M</td>
<td>20-25K</td>
<td>40-49</td>
<td>Cons</td>
</tr>
<tr>
<td>G39</td>
<td>Clothes, wrappings</td>
<td>Bubble wrap shirts</td>
<td>F</td>
<td>10-15K</td>
<td>50-59</td>
<td>Labour</td>
</tr>
<tr>
<td>G58</td>
<td>Convenience food packaging</td>
<td>Fish and chips, take-away</td>
<td>M</td>
<td>Student</td>
<td>20-29</td>
<td>Labour</td>
</tr>
<tr>
<td>G59</td>
<td>Packaging</td>
<td>All house goods</td>
<td>M</td>
<td>Retired</td>
<td>60-69</td>
<td>N/A</td>
</tr>
<tr>
<td>G64</td>
<td>Paper</td>
<td>Plastic containers</td>
<td>M</td>
<td>15-20K</td>
<td>50-59</td>
<td>N/A</td>
</tr>
<tr>
<td>G74</td>
<td>Water, plastic</td>
<td>Cars, plastic, electric appliances</td>
<td>M</td>
<td>20-25K</td>
<td>40-49</td>
<td>Green</td>
</tr>
<tr>
<td>G84</td>
<td>Glass</td>
<td>(see text)</td>
<td>F</td>
<td>Retired</td>
<td>60-69</td>
<td>Labour</td>
</tr>
<tr>
<td>G83</td>
<td>Ready meal dishes</td>
<td>Food packaging</td>
<td>F</td>
<td>Housewife</td>
<td>40-49</td>
<td>Cons</td>
</tr>
<tr>
<td>G89</td>
<td>Food</td>
<td>N/A</td>
<td>F</td>
<td>Student</td>
<td>&lt;20</td>
<td>Labour</td>
</tr>
</tbody>
</table>

Table 6.5 illustrates that Consumers are concerned about excessive waste, typically post-use packaging which they feel is a "big con job" which disguises small portions of food and creates excessive waste (15, 17). Similarly, relatively new types of packaging such as plastics are viewed with scepticism, even where they have benefits such as conserving trees (34). Respondents' perspectives on packaging as a source of waste are also shown in the above table.

Consumers prefer to cook in a traditional way (18), avoiding convenience foods such as ready meals which they associate with excessive waste (3). In this sense these people equate with Contra-consumers, this is confirmed in the following excerpt from the interview with participant four:

"I just don't buy pre-packed stuff I get it all fresh from the supermarket counters... there is more waste with the pre-packed than compared to years ago when it was all loose."
Interestingly, while Consumers emphasise that they use supermarkets, they also perceive them as being a source of waste which did not occur when the grocer weighed out products in the local shop (14).

6.2.5 Summary of Source factor descriptions

Contra-consumer summary

Unlike the other factors, this factor makes the broad connection between the consumption of goods and the problem of waste. People associating with this factor feel that they are driven to consume more goods through advertising and attractive packaging. In common with all the groups, Contra-Consumers emphasises that there is too much packaging on products. People defining this factor stress the belief that much of packaging is unnecessary from the consumers perspective and is present for the convenience of the producer and to promote goods.

Source Reducer summary

While the other factors have emphasised packaging as a secondary concern, this factor places its primary stress on the belief that many products are packaged to excess, and that the problem of waste should be addressed more by producers. They believe the packaging problem is part of the current manufacturing system which could be solved if producers wanted to reduce waste at source. This factor also highlights the dilemma between monetary limitations and the desire to shop in an environmentally responsible fashion.

Historical Commentator summary

The mature respondents who predominantly define this factor introduce the notion of social change to emphasise the ways in which consumption and waste have changed over time. In contrast to Source Reducers, Historical Commentators feel that packaging is necessary for the consumer. However, they still maintain that some packaging is excessive.
Chapter 6: Discourses of Waste in Cleveland

Consumer summary

At a fundamental level this factor is in direct opposition to the views of Contra-consumers. People associating with this factor are positive about increased consumption and they emphasise that it is progressive to be consuming more. Despite their consumerism, these people emphasise, as a secondary perspective, that packaging is in excess and not always necessary.

6.2.6 Sources discussion

The separate analysis of views on the sources of waste serves to emphasise that this is an important issue when one considers waste and the environment. Furthermore, the analysis reveals a common belief that packaging is used excessively, and is a major source of waste.

While this general theme runs throughout the Source study, there are fundamental differences between three of the factors. These different perspectives form a defined spectrum which effectively illustrates the options for reducing waste at source:

<table>
<thead>
<tr>
<th>Factor name</th>
<th>Factor number</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contra-consumer</td>
<td>1</td>
<td>Fundamental</td>
</tr>
<tr>
<td>Source Reducer</td>
<td>2</td>
<td>Practical</td>
</tr>
<tr>
<td>Consumers</td>
<td>4</td>
<td>Status-quo</td>
</tr>
</tbody>
</table>

Contra-consumers look to the fundamental sources of waste in our society. They point to our current consumer-led economy as the prime culprit in causing waste, and to prevent this waste these people feel that the economy needs to shift from being consumer driven. A more practical position is taken by Source Reducers who emphasise that packaging, which they feel is often used excessively, should be reduced through minimisation initiatives. Finally, Consumers emphasise that in their opinion the current situation is satisfactory, and a consumer-led economy should continue, although some reductions in the usage of packaging might be possible. Only Consumers engage with current initiatives to reduce waste at source because the overall
usage of packaging is increasing, even though fewer resources per package are being consumed.

In addition to these sources of waste it is important that most respondents in this analysis made a clear link between MSW and excessive packaging use. The most common communication in Cleveland is that packaging is a major, if not the greatest single source of household waste. Most emphasis is placed on packaging as a source of waste by Source Reducers who emphasise that packaging is used to excess, with much of it being a consequence of current production and distribution techniques. Historical Commentators believe that although packaging is necessary its use has increased to excessive proportions, particularly in the lifetimes of the people who define this discourse.

This link between waste and excessive packaging use is important in light of the Packaging Regulations (see Chapter 3) introduced as a response to widespread concern about the levels of post-use packaging in MSW. This original EC Directive has had various effects amongst householders across Europe, depending on the approach taken to increasing recovery levels. In Britain it is widely believed that there will be a significant impact on UK householders if the requirements of the Directive are to be met by the UK government and British packaging producers. While many householders in this study recognise the links between packaging and waste, it is fair to say that they do not realise the changes which will be required for Britain to meet its obligations required by the Packaging Directive.

While the link between packaging and waste is clearly defined in this study, it is less clear what difference the householders can make to the reduction of waste at source, or as Schultz (1993) calls it, "precycling". Contra-consumers, Source Reducers, and Consumers communicate three important issues in relation to precycling. Where possible, Contra-consumers participate in precycling activities, such as by avoiding ready meals and shopping in local markets. However, their key concern is that they are not encouraged or empowered to precycle and thus feel that they cannot reduce waste, and that packaging is inevitable. Source Reducers stress that economic constraints are sometimes placed on our desires to behave in an environmentally responsible fashion.
Despite their environmental concerns Source Reducers have limited purchasing power, and consequently they buy products which are cheaper even though they might have higher environmental costs than expensive ‘eco-products’. This emphasises the fact that a person’s environmental aspirations have economic limitations dependent on the dominant political economy, and thus suggests that economic considerations override environmental concerns. Finally, Consumers embrace the current consumer-led economy by demanding packaging, ignoring precycling and having a preference for packaged goods. While this study highlights three important views on ’precycling’, it is not the intention to examine these in detail, although the implications of the problems of waste at source have an important bearing on the discussion in the following chapter.

These local perspectives on the sources of waste brought out by Q Methodology are useful for the discussion which follows here and in the remaining chapters. A key reason for their importance is that the perspectives reveal an incongruity between the desire among most householders that the problem of waste be addressed further up in the production chain, and the actual practice in waste management which tries to emphasise post-consumer recovery as a solution to the problem. These themes will be returned to later in the discussion. However, the issue of the disposal of waste is considered next.

6.3 Interpretation of the Disposal factors

A three factor solution was produced for the Disposal sample, resulting in 22 respondents defining the first factor, 23 the second, 10 the third, and the remainder (34) with mixed loadings. Most (24) of the respondents with mixed loadings gravitate toward factors one and two.
### Table 6.6 Rotated factor matrix for the Disposal sample

<table>
<thead>
<tr>
<th>O-Sort</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
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x = defining respondent; z = respondent with mixed loading

The interpretation of the three factors from the Disposal sample follows a similar format to the Source factors, and the complete factor array is included in Appendix L. Once again, the numbers in parentheses refer to Q sample statement numbers.

#### 6.3.1 Factor One - “Incoherent Environmental”

This factor is distinct from factors two and three because perspectives on waste and the environment seem to be driven by an emotive response towards issues of ‘the environment’. This emotive core is apparent among respondents who identified
strongly with this factor, especially on issues relating to household waste, and is complemented with a sense of urgency that 'something should be done'. However, it was also apparent that the connections made between waste and wider environmental issues lacked an overall coherence, despite an awareness that there may be a connection. As such, people who identified strongly with this factor are called 'Incoherent Environmentalists'.

Incoherent Environmentalists seem to make a clear connection between waste and broader global environmental issues (32). The association between waste and the environment is verified in the following excerpt from the ethnographic interview with participant 36:

"Waste is connected to habitat destruction and pollution of the environment, particularly things like the pollution of the sea from organic sewage..."

As a consequence of this connection, respondents emphasise that everyone should have an interest in the ways in which we dispose of our waste (60). We should have this concern for household as well as more hazardous wastes, such as radioactive and toxic waste, because every home in the country produces refuse (35). With this in mind, defining respondents indicate that they are mindful of the refuse they throw out from day to day (51, 56). This, as we will see, is in clear contrast with respondents who associate with factor three.

While this factor communicates the concept that domestic refuse has an impact on the global environment it also emphasises a concern for the local environment. People associating with this factor feel that Billingham, the site of the new EfW facility, has more than its just deserve of pollution (33), while they also feel that the area in which they live is contaminated by industries (55). This perspective is illustrated in the following quotation from the interview with respondent 20:

"... it just seems to be Billingham all the time. I can understand, to a degree, why we don't want to take it [waste] to some virgin land. But if they think all the time; well its chemically damaged land, so therefore it doesn't matter and we'll dump on it again and again, then we are never going to get away from that thought process."

Although the homes of Incoherent Environmentalists are spread across the county, a number of people who live in the Billingham/Haverton area associate with this factor.
A core of the Incoherent Environmentalists feel that specific areas around the CWM and Portrack incinerators have more than their fair share of polluting activities. The fact that Incoherent Environmentalists think about the Portrack incinerator, even when they do not live near it (18) illustrates that some people think about the regional environment which is beyond their own neighbourhoods. The fact that 14 of the 22 people defining this factor live within three miles of the mid-point between the Portrack and CWM incinerators (seven will live closer to the incinerator when it is finished) supports the argument that there is a core of people who think that their locale is over-burdened with polluting facilities.

People associating with this factor communicate a necessity for conserving their local environment which they see as being important for their well being. These people perceive that a new EfW facility will have an impact on themselves and their environment (8). The main impact anticipated lies deeper than personal inconvenience (39) and converges around anxieties about airborne emissions from the facility. It would appear that these anxieties have been intensified by the old Portrack incinerator which respondents do not like to see “belching out filth” (34). The central emphasis in this factor is placed on avoiding emissions by not building the EfW facility, because EfW is perceived as an unnecessary source of pollution (25, 31, 41). Concern for emissions is a strong emotive issue in the ethnographic interviews conducted for this research:

“Drugs are illegal, there are heavy penalties for drug dealers. These things [dioxins] are worse: the most toxic thing known to man. How can that not be illegal? We are producing it, it’s not natural, we are producing it through our industrial society, - its totally criminal”. (respondent 36)

In addition to emissions, a new facility is perceived as eroding householder and the local authority commitments to recycling (17). While factor two communicates the idea that EfW is essentially the same as recycling, people associating with this factor feel that it is a very different process (27). The argument that EfW is similar to recycling (because both processes recover value from waste, and thus save resources) is dismissed by Incoherent Environmentalists as illustrated by respondent 12:
“If you talk green issues then, if it’s to produce electricity, you might save fuels, but what’s coming out of the stack? It’s no good producing electricity if it is putting toxic fumes out the stack. ... and it’s no good producing a small amount of electricity if it is producing dioxins and acid-rain materials, or whatever.”

Recycling is perceived as being a genuine solution to the problem of resource use and waste in a throw-away society (43), whereas EfW is seen as creating more problems such as atmospheric emissions. The following excerpt (respondent 13) verifies the distrust of EfW:

“[With EfW] it is almost like they are demanding a certain level of waste from people to produce the electricity so that they can make cash, so it looks like it will increase waste rather than solve any problems. It’s people under the disguise of a green banner just to make cash...”

Although considerable hostility towards incineration is expressed, defining respondents clearly dislike landfill as a disposal option (5), particularly if a site were to be opened in their neighbourhood (16).

Unlike the other respondents, Incoherent Environmentalists express a negative attitude toward the EfW option as a component of waste management. In addition to concerns over pollution, these respondents question the wisdom of the waste management strategy chosen by CCC, emphasising that twenty five years is a long time to incinerate the majority of Cleveland’s waste (1). They also emphasise their unease with a privately owned incinerator which they believe would be driven by profits and out of the direct control of the council. This drive for profit and lack of public control, respondents feel, will result in a lack of public and environmental accountability (40). This emphasis on public rather than private ownership is confirmed in the following statement:

“I still think facilities like water, waste and gas should belong to the people and I think things like this, which are for our own good, should be run by the people for the people and shouldn’t necessarily have to make a profit” (respondent 12).

Defining respondents aversion to the EfW option is confirmed in Table 6.7 which summarises their answers to Question 2 on the background questionnaire, which asks “What are your impressions of waste incineration with electricity generation as a way of getting rid of Cleveland’s waste?.” It is clear from this table that answers to Question 2 indicate a wariness of the EfW option in waste management. Seven of the respondents
are negative about the prospect of a new incinerator, these people add comment on their concerns that the environmental problems associated with EfW will outweigh the benefits of electricity generation. Five people believe that a new facility might be “OK” but they hold caution in reserve with regards to the “side effects” or long term viability of a new incinerator. While six people are positive about the new plant, they have reservations, principally with regard to emissions and toxic residue from the facility.

Table 6.7 Incoherent Environmentalists - Question 2: ‘What are your impressions of waste incineration with electricity generation as a way of getting rid of Cleveland’s waste?’

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<tr>
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<th>Comment on question</th>
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<th>Job/Income</th>
<th>Age</th>
<th>Politics</th>
<th>Miles*</th>
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<td>M</td>
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<td>&lt;20</td>
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<td>Suspicious</td>
<td>F</td>
<td>Nun</td>
<td>50-59</td>
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<td>Retired</td>
<td>70</td>
<td>Lib Dem</td>
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<td>Don’t like it</td>
<td>F</td>
<td>10-15K</td>
<td>50-59</td>
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<td>M</td>
<td>10-15K</td>
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<td>40-49</td>
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<td>M</td>
<td>Student</td>
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<td>Labour</td>
<td>3.6</td>
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*Miles (as the crow flies) from the mid-way point between Portrack and Haverton Hill incinerators.

Table 6.7 also summarises some background information on the people who defined this factor. Defining respondents do not fall into a predominant group, however, there are a few trends which need mentioning. Students and people earning £10,000 - £15,000 a year are well represented with this factor. The political affiliation of people defining this
factor appears to be the most significant piece of background information. From the whole of the p-set in this study four people said they supported the Green Party and two said they supported socialist parties and 3 of the Green Party supporters, and both of the socialists defined this factor. The remainder of the people defining this factor preferred Labour or the Liberal Democrats, none of these respondents preferred the Conservatives.

6.3.2 Factor Two - “Acquiescent Participation”

Respondents associating with this factor link waste with environmental problems, but they tend to make this link at a lower, local level (52) than Incoherent Environmentalists, who make a broader global link between their waste and ‘the environment’. The respondents in this group have no particular objection to current waste management strategies and are happy with their level of participation in them. In this way, the respondents can be termed ‘Acquiescent Participants’, as they accept the prevailing waste management strategies without protest, but are happy to participate in waste initiatives (e.g. recycling schemes) which appear to benefit ‘the environment’ in some way.

The difference in perspectives on waste and the environment between Incoherent Environmentalists and Acquiescent Participants is confirmed by the defining respondents’ answers to questions 9 and 11 on the background questionnaire. These asked: “what do you think of when you think of the environment?” (Question 9); and “if any, what global environmental issues concern you?” (Question 11). Incoherent Environmentalists gave broader, more nebulous answers relating to ‘the environment’ at a larger, global scale, whereas Acquiescent Participants gave less sweeping answers with more practical relevance to the local situation.

Despite not making a particular ‘global environmental’ link, Acquiescent Participants are keen to participate in activities which they believe help ‘the environment’, such as recycling, while also exhibiting an unselfish attitude towards protecting ‘the environment’ (18, 22). This eagerness to participate in activities which Acquiescent
Participants believe help resolve the problem of waste is communicated by participant 37:

I hope my little bit does a little bit to help it [the environment], so if everyone else did a little bit, it would end up being a big bit. All I think of is the seaside joke in a dry year; there is a woman having a pee in the water and she says "every little bit helps".

One of the ways in which these people feel they become involved at an individual level is by recycling, this also forms one of the dominant aspects of this factor. While people defining this factor do not emphasise a clear link between waste and the wider or global environment, they clearly have a conviction that recycling helps ‘the environment’ (48), principally by means of saving resources (43). This conviction is strengthened by the belief that current recycling facilities are comprehensive enough for them to participate effectively in recycling (45, 57). Recycling is also associated with a feel-good factor, respondents emphasise that when they recycle it makes them feel like they are participating in something worthwhile (7). Equally, when they do not recycle they experience a feeling of guilt (19). Although recycling is perceived as a worthwhile activity, respondents do not believe that their activities will bring about any changes to the current economic system (21).

Question 8 on the questionnaire asked participants to explain what they understood by four labels commonly used on packaging. Appendix M illustrates the meanings defining respondents from all three factors gave to these symbols. Although people associating with this factor place more emphasis on recycling, they have a less coherent understanding of the symbols than those defining factor one.

People defining this factor clearly believe in recovering value from waste, and this belief stretches beyond recycling, to re-use (20) and onto refuse incineration with energy recovery. Defining respondents take a positive view of EfW, perceiving it as being a better option than landfill because value, in the form of electricity, is recovered (24). Equally, these people prefer EfW because the refuse is treated immediately, and consequently emissions can be better controlled (14). Respondents’ perspectives on a waste strategy which involves both recycling and EfW is reinforced in the following excerpts from interviews with participants 14, 5 and 37:
"...it needs to be a balance between as much recycling which can be done, reasonably economically of course, and obviously then incineration, and hopefully we will get it right."

"So OK, you could end up having to send your plastic bottles to burn, paper yes you can burn that. So instead of recycling you are producing 40 per cent energy [and recycling the rest]."

"They should still take out stuff before they burn it. Forget about the household food, burn it, but save metals, bottles and paper."

Table 6.8 reinforces the positive perspective which these people have about EfW. In answer to question two on the background questionnaire, 19 of the 23 respondents defining this factor indicated that they think EfW is a positive step for waste management in Cleveland. Only one person is negative about the new EfW plant, this respondent is worried about the location, rather than the actual process of incineration with energy recovery.

Unlike in factor one, Acquiescent Participants have few worries about emissions from a new incinerator. It is believed that EfW would be a cleaner project (31), and not an unnecessary source of atmospheric pollution (41). People defining this factor feel that there are far worse pollution problems from the large industrial areas of Cleveland, such as ICI66, than the pollution from the old incinerator at Portrack (2). A new incinerator, therefore, is not perceived as being a major polluter in the context of Cleveland. The following excerpt from the interview with respondent 17 reinforces people's concern about pollution from large industries:

"This area is being tested for our chest problems, we all have chest problems, but they haven't come up from where they [chest problems] came from, yet we are not far from ICI."

---

66 It is the case here, and generally among the Cleveland public, that when ICI is mentioned it is a generic term, referring to the ICI Billingham and ICI Wilton complexes which house several different chemical companies as well as ICI.
Table 6.8 Acquiescent Participants - Question 2: 'What are your impressions of waste incineration with electricity generation as a way of getting rid of Cleveland's waste?'

<table>
<thead>
<tr>
<th>Q-sort</th>
<th>Response</th>
<th>Comment</th>
<th>Sex</th>
<th>Job/Income</th>
<th>Age</th>
<th>Politics</th>
<th>Mi*</th>
<th>Ch#</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Positive</td>
<td>Agree with it</td>
<td>F</td>
<td>Retired</td>
<td>60-69</td>
<td>N/A</td>
<td>6.9</td>
<td>-</td>
</tr>
<tr>
<td>B4</td>
<td>Positive</td>
<td></td>
<td>F</td>
<td>10-15K</td>
<td>40-49</td>
<td>Labour</td>
<td>2.5</td>
<td>+</td>
</tr>
<tr>
<td>B5</td>
<td>Positive</td>
<td>Good if possible</td>
<td>M</td>
<td>Retired</td>
<td>60-69</td>
<td>Cons</td>
<td>2.7</td>
<td>+</td>
</tr>
<tr>
<td>B8</td>
<td>N/A</td>
<td></td>
<td>F</td>
<td>&lt;10K</td>
<td>20-29</td>
<td>N/A</td>
<td>1.2</td>
<td>-</td>
</tr>
<tr>
<td>B10</td>
<td>Positive</td>
<td>Sounds good</td>
<td>F</td>
<td>10-15K</td>
<td>50-59</td>
<td>Lib Dem</td>
<td>1.4</td>
<td>+</td>
</tr>
<tr>
<td>B14</td>
<td>Positive</td>
<td>Agree with regeneration</td>
<td>M</td>
<td>MD 25K+</td>
<td>50-59</td>
<td>Cons</td>
<td>4.1</td>
<td>+</td>
</tr>
<tr>
<td>B17</td>
<td>Positive</td>
<td>Care with plant situation</td>
<td>F</td>
<td>Retired</td>
<td>50-59</td>
<td>Labour</td>
<td>1.8</td>
<td>+</td>
</tr>
<tr>
<td>B21</td>
<td>Positive</td>
<td>Care with plant situation</td>
<td>M</td>
<td>Retired</td>
<td>60-69</td>
<td>N/A</td>
<td>2.7</td>
<td>-</td>
</tr>
<tr>
<td>B22</td>
<td>OK...</td>
<td>..if there is less pollution than present</td>
<td>M</td>
<td>Retired</td>
<td>60-69</td>
<td>N/A</td>
<td>2.7</td>
<td>-</td>
</tr>
<tr>
<td>B26</td>
<td>Positive</td>
<td>Good for community</td>
<td>M</td>
<td>Retired</td>
<td>70+</td>
<td>Cons</td>
<td>3.4</td>
<td>+</td>
</tr>
<tr>
<td>B29</td>
<td>N/A</td>
<td></td>
<td>F</td>
<td>Retired</td>
<td>60-69</td>
<td>N/A</td>
<td>1.2</td>
<td>+</td>
</tr>
<tr>
<td>B37</td>
<td>Positive</td>
<td>Very practical</td>
<td>M</td>
<td>Retired</td>
<td>60-69</td>
<td>Labour</td>
<td>1.1</td>
<td>+</td>
</tr>
<tr>
<td>G38</td>
<td>Positive</td>
<td>Good and quick</td>
<td>M</td>
<td>Retired</td>
<td>70+</td>
<td>None</td>
<td>2.0</td>
<td>-</td>
</tr>
<tr>
<td>G42</td>
<td>Positive</td>
<td>Don't know consequences</td>
<td>M</td>
<td>Retired</td>
<td>60-69</td>
<td>Lib Dem</td>
<td>2.6</td>
<td>-</td>
</tr>
<tr>
<td>G45</td>
<td>Positive</td>
<td>Good as other options</td>
<td>F</td>
<td>Retired</td>
<td>70+</td>
<td>Labour</td>
<td>2.5</td>
<td>+</td>
</tr>
<tr>
<td>G46</td>
<td>Positive</td>
<td></td>
<td>F</td>
<td>N/A</td>
<td>50-59</td>
<td>Labour</td>
<td>1.9</td>
<td>-</td>
</tr>
<tr>
<td>G56</td>
<td>Negative</td>
<td>Too near to houses</td>
<td>F</td>
<td>Retired</td>
<td>60-69</td>
<td>Cons</td>
<td>2.6</td>
<td>+</td>
</tr>
<tr>
<td>G63</td>
<td>Positive</td>
<td>Cheap power source</td>
<td>M</td>
<td>Student</td>
<td>&lt;20</td>
<td>Lib Dems</td>
<td>3.4</td>
<td>+</td>
</tr>
<tr>
<td>G65</td>
<td>Positive</td>
<td></td>
<td>M</td>
<td>Retired</td>
<td>70</td>
<td>Labour</td>
<td>3.8</td>
<td>+</td>
</tr>
<tr>
<td>G71</td>
<td>Positive</td>
<td></td>
<td>F</td>
<td>Retired</td>
<td>60-69</td>
<td>Cons</td>
<td>3.6</td>
<td>+</td>
</tr>
<tr>
<td>G80</td>
<td>Positive</td>
<td>Very resourceful</td>
<td>F</td>
<td>Student</td>
<td>&lt;20</td>
<td>N/A</td>
<td>3.1</td>
<td>+</td>
</tr>
<tr>
<td>G83</td>
<td>Positive</td>
<td></td>
<td>F</td>
<td>Housewife</td>
<td>40-49</td>
<td>Cons</td>
<td>3.6</td>
<td>+</td>
</tr>
<tr>
<td>G85</td>
<td>Positive</td>
<td></td>
<td>F</td>
<td>Housewife</td>
<td>30-39</td>
<td>Labour</td>
<td>3.7</td>
<td>+</td>
</tr>
</tbody>
</table>

* Miles (as the crow flies) from the mid-way point between Portrack and Haverton Hill incinerators
# Change in distance between the new incinerator and the home of the participant (+ indicates further away).

There has been considerable debate between advocates of recycling and EfW. Promoters of recycling argue that EfW infringes on their activities. Interestingly, Acquiescent Participants are very keen to recycle and yet they do not perceive a new EfW facility as an infringement on their recycling activities or those of the local authority’s (17). This communality between recycling and EfW is taken a step further by these people who think EfW is basically the same as recycling (27). Having said this, recycling is still seen as an important part of a waste strategy, and even with incinerators which recover energy, Acquiescent Participants believe recycling should continue (4).
In contrast to Incoherent Environmentalists, respondents here do not prioritise their local environment when communicating perspectives on waste, in particular they feel that Billingham has no more or less pollution than any other area in the county (33). This perspective most likely arises from the fact that only two people defining this factor live in Billingham which is close to the site for the new plant. The rest of the respondents will live further from the new incinerator when it is finished (Table 6.8). This geography compares with the Incoherent Environmentalists where eleven people will live further from the EfW plant, seven closer, and four the same distance. In addition, three Incoherent Environmentalists live in Billingham and three in Haverton, both of places are close to the new facility. All of those defining the third factor will be further from the new incinerator when it is complete. The fact that the majority of the people defining this factor will live further from the new plant could provide an explanation why they feel that EfW is a good management option. However, in light of the whole discourse this explanation is probably too simplistic, particularly when the distances involved are relatively small.

In terms of politics, Table 6.8 seems to indicate a political balance among the defining respondents for this factor. Of those who disclosed their political affiliation seven support Labour, seven Conservative, and three Liberal Democrat. While this might seem like a representative balance for the whole of Britain, for Cleveland, it is inclined towards a Conservative bias. This factor is defined by more Conservatives in relative terms because the political structure of Cleveland is dominated by Labour (Chapter 4). In addition to conservatism, Acquiescent Participants are skewed towards older age groups. Twelve of the 23 defining people were over sixty years of age and five more over fifty. This is also reflected in respondents' occupations with over half of the people being retired. It would appear, therefore, that older, more conservative people have fewer fears of technology than the younger more liberal people associating with the first factor.

Although factors one and two offer different perspectives about waste strategies and the environment, a number of people associate with both these perspectives. Respondents
associating with the perspectives offered in factors one and two form the majority of the p-set with mixed loadings as shown in Table 6.6.

6.3.3 Factor Three - “Apathetic/NIMBY”

For the people defining this factor, household waste is not really an issue of concern. These people are not conscious of the things they throw away (51, 56), and simply wish to see that it is taken away from their homes on a regular basis. They are not concerned about what happens to this waste, providing that the destination is nowhere near them. In this way, these people can be labelled as ‘Apathetic NIMBYs’.

This perspective is confirmed in the following extracts from interviews with respondents 2 and 11:

I don’t think its a subject that a lot of people think about... I just throw my rubbish out and that's the end of it, I don't stop and think where does it go, I don't even think about it67.

If you are like me and my wife, you buy something, use it, put it in the plastic bag, trundle it out on bin day and as far as I am concerned that’s the end of it. The wagon picks it up and it's gone.

It is not particularly surprising that respondents with this perspective do not recycle. However, they say that they might if there was a facility nearer their homes, such as at the end of the street (45). Apathetic NIMBYs do not recycle because facilities are located inconveniently, and this means that considerable effort is needed to recycle (6, 38, 49). The need for convenience is reflected in the following passage from the interview with participant 31:

“If someone came round and said we'll give you two dozen bags, can you put your tins in that bag and your bottles in that bag, I would be willing to do that. But I couldn’t do it myself because I just haven’t got the patience. I just shot it all in the bin. But if someone said we will come and collect it then I would do it.”

Apathetic NIMBYs do not get involved with environmental issues for the same reasons that they do not recycle, as it is too much effort (52). Respondents, however, are under no pretences that they participate in actions which help the environment (50). Equally,

67 While it is recognised that rubbish is not the same as waste, respondents in this study attributed the same definitions to waste and rubbish.
they do not feel that they should take responsibility for issues unless they are directly affected.

Despite this inaction, some environmental concern is expressed in this factor. For example, it is more important to limit the production of dioxins or acid rain materials than it is to generate electricity from waste (25). Similarly, landfills are perceived as being detrimental to the environment (28), the negative opinion of landfills is communicated in the interview with respondent 34 who had worked as a bin man for six years:

"I don’t like landfills and from what I have seen from working on the bins, sooner or later something will go seriously wrong with a landfill site. With some of the landfill sites I have seen it’s only been by sheer good luck, more than good management, that there hasn’t been something go disastrously wrong..."

A perspective shared by Incoherent Environmentalists and Acquiescent Participants is that the current economic system is not dealing with environmental issues adequately. Apathetic NIMBYs, however, believe that it would be possible to implement changes to improve the environment within the current economic system (54). This notion of expansionist progress is confirmed by the rejection of a conserving, or self-sufficient society (29).

More enthusiasm is expressed in relation to the local rather than the global environment in this factor. Like Incoherent Environmentalists, respondents feel that Billingham has got more than its fair share of pollution (33). Apathetic NIMBYs’ views on the local environment become particularly animated when waste management issues are raised. For example, they suggest that incinerators should be built in more sparsely populated areas, like Seal Sands (58), and landfills would not be a welcome addition in the neighbourhoods where Apathetic NIMBYs live (16). This position is substantiated by the locations of respondents’ homes. Eight of the ten people who define this factor live in the suburbs of Stockton, or in more rural satellite towns such as Norton, Eaglescliffe and Yarm. The perceived impact of a waste facility in their neighbourhoods would appear to be greater than for established industrial areas such as Billingham, Stockton or Middlesborough.
While Billingham is seen as having more than its fair share of pollution, respondents do not communicate a problem with the location of the new EfW plant in either the interviews or questionnaires. This is probably because the new plant will be further away from all of these respondents than the current incinerator at Portrack (see Table 6.9). Of the three factors discussed in the disposal sample, this element of distance is the one most closely associated with the NIMBY phenomena. The NIMBY perspective on waste facilities was illustrated in the interview with respondent 31 who said the following when discussing the location of the H. J. Banks landfill at the Clarances:

"As long as it's not on my backdoor I don't care where they put it".

Apathetic NIMBYs have more hostility towards landfills than people defining factors one and two. Landfills are viewed negatively because they are not seen to be the only way in which waste can be disposed (5), and this is reinforced with the opinion that landfills are like time bombs, storing up waste for future generations to deal with (13). This long-term perspective on the disposal of waste is reflected in respondents view that building a new EfW plant is a good idea. People associating with this factor feel that it is better to burn than to bury waste (14) because with incineration the waste is dealt with immediately and not stored up for future generations (14).

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68 Some elements of this discourse indicate a NIMC(hildrens)BY syndrome which appears to be more complex than this manifestation of NIMBY.
Table 6.9 presents the answers given to question two from the questionnaire. Most people have a positive impression of the new EfW facility, with only one person taking a negative stance, which they indicated was due to a mistrust of ‘the government’.

In light of their positive perspective on waste incineration respondents feel that the people dealing with waste policy made the right and responsible decision in deciding to build a new EfW facility (3). Unlike in factor one, people defining this factor feel that twenty five years is an acceptable length of time for burning Cleveland’s waste, and they do not foresee the four councils having difficulties in burning waste for this period (1). Sourcing this waste for 25 years is not seen to be a problem because waste is as inevitable as death and taxes (10). These positive perspectives of EfW could reflect relief that Cleveland’s waste will be managed in someone else’s ‘back yard’ for 25 years.
6.3.4 Summary of Disposal factor descriptions

Incoherent Environmentalists

These people take a wide perspective, making a firm link between waste and broader, principally global, environmental issues, while also believing that the regional (Cleveland) environment could be improved. Domestic waste, therefore, is perceived as an issue which should be of pressing concern. They perceive that both the global and local environments are in poor shape, and need protecting. While landfill is perceived as an unacceptable disposal solution there is concern about EfW because it is believed to contribute to environmental pollution. Recycling is clearly preferred to EfW.

Acquiescent Participant summary

People defining this factor make a more pragmatic link between waste and the environment than Incoherent Environmentalists. These discourses view waste as an environmental problem requiring a solution, firstly with recycling and then the best option available, which could be EfW. Recycling is seen as an important component and it produces guilt when non-participation occurs. Personal recycling efforts are not perceived as being threatened by EfW, which is greeted as a useful and efficient means of dealing with waste and is considered more appropriate than landfill. Preferred waste management is a balance between recycling and EfW.

Apathetic NIMBY summary

This group communicates a concern for the local environment, but only if it is under threat from developments such as EfW plants or landfills. Waste is viewed indifferently, and therefore no problems are foreseen with Cleveland's waste management as long as it is away from the people in this group. Environmental issues are rarely given a thought, and they may participate in recycling if it was easier and more convenient. The CWM incinerator is seen as a positive development because it prevents landfill, gets rid of waste and is away from the people associating with this perspective.
While the disposal discourses focus on Cleveland, they also highlight some of the key trends at a broader level which help to explain why Britain is promoting EfW and some of the difficulties which have been experienced. Firstly, Incoherent Environmentalists highlight some of the reasons why some EfW planning applications have been contested. Although it was not the case in Cleveland, in some regions where these perspectives prevail, local struggles against the construction of an EfW plant have arisen. Second, Acquiescent Participants point to some of the reasons why EfW is promoted in Britain, particularly when integrated with other management methods such as recycling and composting. While this perspective reflects the worth of an IWM approach, it does not reflect the Cleveland, and often British EfW experience where incinerators dominate the local management hierarchy. Lastly, Apathetic NIMBYs provide a very clear reason why EfW is being promoted in Britain. People with this perspective find recycling inconvenient and consequently they do not participate. This situation is repeated across Britain and although people say they would recycle, there are a great many who do not. This lack of participation means that Britain is looking to EfW as a method to increase recovery levels to meet future EC targets.

6.4 Summary

This political ecology seeks to analyse the perspectives of individuals in an attempt to analyse their relationships with the political economy within which they are situated. This innovative methodology has allowed individuals to communicate issues about waste and the ‘environment’ which they believe to be important. The methodology then permits these individuals to measure themselves with regard to these issues. The results from this technique reveal that there are predominant discourses in circulation in Cleveland which illustrate how people experience and perceive waste at the local level.

In using Q Methodology people are empowered to express their own perspectives without being stifled with technological jargon, or logical inference. Individual’s subjectivities have then been exposed to factor analysis which has rendered common families of perspectives, which represent local discourses of waste. These discourses are of central significance to this political ecology because they illustrate the complexity
of views which circulate in Cleveland. The next chapter will discuss some of the key relationships between individuals and the waste management situation in Britain.
7. Discussion

7.1 Introduction

Q Methodology has enabled this project to unearth detailed perspectives which are in circulation amongst some of Cleveland’s residents. These perspectives are central to political ecology which situates the individual within a number of nested scales of analysis which range from the level of the home to the global environment. Chapter 6 highlighted how householders view the origins and management of waste, and this revealed that there are considerable variations in these views. This chapter uses the information derived from Q, and the detailed aspects of the political economy of waste management in Cleveland and Britain (Chapters 3 and 4), to illustrate key waste management issues. These issues are analysed from the perspective of the individual, and they attempt to explain the relationships between householders and the broader waste context within which they are situated.

While the nested scales utilised in political ecology are central to the analysis in the first half of this chapter, the conceptual aspects of the approach are more important in the second half which critically examines broader issues in ‘waste’ management. This latter part discusses an important conceptual link between the theory of political ecology and the problem of waste legitimisation and the inherent contradictions of this legitimisation, which have some long term implications.

7.2 Politicisation and policy in waste management

This thesis has highlighted a number of real and perceived issues which have resulted in domestic waste becoming an ‘environmental’ issue which is contested politically at many levels. Chapters 3 and 4 described how household waste came to be a problem for local communities in Britain, particularly towns and cities, because the availability of cheap and convenient disposal sites began to diminish. In the late 19th Century this pressure on disposal was driven by a lack of suitable landfill sites in and near urban areas. In the past decade this pressure has been driven by policies designed to divert
waste from landfills, which have made this option of disposal expensive. This pressure has posed and continues to pose the greatest problems for large conurbations.

Political pressure to monitor and plan for waste management came in 1974 with the enactment of the Control of Pollution Act (COPA). The COPA was significant for two main reasons, firstly it defined domestic waste as a ‘controlled’ waste, and secondly, it required local authorities to formulate plans for managing their waste. This formal recognition of the problems associated with household waste was important because it coincided with (but was not necessarily linked to) the rapidly rising environmental movement, which in the late sixties had growing concerns about environmental hazards and pollution. The growth of environmentalism has at times been focused on household waste, particularly in relation to old incinerators, such as the one built at Portrack, and the abandonment of reusable packaging by producers, such as Schweppes in the 1970s. This rising awareness of the problems of waste has been matched by a growth in the popularity of recycling, which is often posited by environmental groups as being the key to resolving the domestic waste problem.

A number of legislative tools have been enacted over the past 25 years in recognition of, and contributing towards, the increasingly politicised nature of household waste, and much of this policy has been introduced since the Environmental Protection Act of 1990. Much of this legislation has been discussed throughout this thesis because of its important influence over local waste management. Much of today’s waste management policies are designed to force the management of household waste up the waste hierarchy, away from landfill and towards source reduction. Although this hierarchy is a framework around which decisions based on the ‘best practicable environmental option’ are to be made, it is sometimes viewed as a prescriptive device for making waste management decisions.

The waste hierarchy is central for defining the aspirations of waste management, but is an area which is continually debated. While there is little disagreement about the overall aim of reducing the amount of waste being landfilled, there is much debate about the order of the other management practices in the hierarchy. The waste hierarchy, therefore, is politically contested at all levels from the local to the national. This
contestation is demonstrated in this study and needs further discussion as it illustrates the continued politicisation of waste at the level of policy\textsuperscript{69}.

### 7.2.1 Interpretations of the waste hierarchy

Although the central problem with waste management and the hierarchy is the focus on waste recovery rather than source reduction (discussed later), the concern here is with the different interpretations of the hierarchy which result at different political levels. This thesis has illustrated four interpretations of the hierarchy and these are summarised in Table 7.1. These have important political and practical ramifications for the management of household waste, and they serve to form the context for later discussions of individual perspectives of waste and its management.

\textit{Table 7.1 Interpretations of the waste hierarchy}\textsuperscript{a}

<table>
<thead>
<tr>
<th>Priority</th>
<th>EC hierarchy</th>
<th>British hierarchy</th>
<th>Cleveland management hierarchy</th>
<th>Cleveland UA preferred hierarchy</th>
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<tr>
<td>High</td>
<td>REDUCE</td>
<td>REDUCE</td>
<td>Efw</td>
<td>RECYCLE</td>
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<tr>
<td></td>
<td>Re-use</td>
<td>Re-use</td>
<td>Landfill</td>
<td>Re-use/reduce</td>
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<td></td>
<td>Recycle</td>
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<td>Recycle</td>
<td>Efw</td>
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<tr>
<td></td>
<td>EfW</td>
<td>Landfill</td>
<td>Re-use/reduce</td>
<td>Landfill</td>
</tr>
<tr>
<td>Low</td>
<td>Landfill</td>
<td></td>
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</tbody>
</table>

The waste hierarchy has developed in reaction to political pressure on waste management, which has arisen in different forms and guises throughout the developed world. Although political consensus is rare, the hierarchy adopted by the EC best illustrates the European (if not the global) approach to waste management. Despite the fact that this hierarchy has been broadly adopted, differences in its interpretation at

\textsuperscript{69} At present the hierarchy is being debated by the waste industry as a result of \textit{Less Waste, More Value}, the government's consultation document on Britain's waste strategy.

\textsuperscript{70} For the purpose of this discussion composting is ignored.
various levels of political activity exist. For example, the hierarchy adopted in Britain equates recycling and EfW, while the EC interpretation preferences recycling. Equally, EfW dominates the hierarchy in Cleveland, arguably at the expense of recycling, which is preferred by Cleveland's local authorities (see Chapter 4), and source reduction.

Although there is a legislative framework in place for the management of waste in Britain, it can be interpreted in a number of ways, thus allowing for the development of different versions of the waste hierarchy. The factors which steer these interpretations are intended to be controlled by choosing the BPEO for any particular locality. In Cleveland the local authorities argue that the County Council, along with the private waste management company, contravened the hierarchy by focusing on EfW. This statement is interesting for both practical and political reasons. Practically, the argument posited by the LAs has some validity because the EfW plant may not be the BPEO because its capacity for waste is too great, and other management initiatives, such as recycling and source reduction may be hampered. Equally, it has also been necessary to import waste from Gateshead to fulfil the facility's demand for waste.

The protest about EfW by Cleveland's local authorities is interesting politically because it reflects the contradictory nature of some aspects of Britain's waste strategy. Local authorities have been set 'aspirational' targets by central government to recycle 25% of household waste by 2000. Because the Cleveland EfW plant burns 87% of the county's waste it will be impossible for these authorities to meet their targets. The reason why 87% of waste is being incinerated is because the management of waste has been moved from the public to private sectors, and for the private sector to finance an EfW facility it is necessary to build a large plant which is linked to a long term waste contract. This inconsistency between national and regional interpretations of waste strategy means that local authorities can be in a situation where they are competing with their private sector waste managers for household waste, and as a result local political tensions grow.

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See Appendix N for a detailed discussion of the debate involving EfW versus recycling.
These tensions are significant because they illustrate the politicised nature of local and national waste strategies which form the backdrop for the discussion of local perspectives of waste and its management which follow. This conflict and contradiction in waste management is also returned to in the latter part of this chapter which explains the legitimisation of waste.

7.3 Perspectives of waste and the environment

As an ‘environmental’ issue, household waste is particularly interesting because to some extent almost every citizen is involved in its management. This characteristic means that individuals can be either ‘passive’ or ‘active’ participants in waste management, and few individuals avoid any involvement. Passive individuals perform the bare minimum in waste management, by placing their household waste in the street for collection. Active individuals undertake activities with their waste which are linked to the ‘environment’, such as participating in kerbside or ‘bring’ recycling schemes. Measuring the degree to which individuals are active in domestic waste management is extremely important since it is a key area in which householders can make a statement about their environmental awareness and intentions.

Although the sample of participants in this study is quite small, the innovative use of Q Methodology in political ecology used here produced three perspectives on the management of waste and the environment. All three of these perspectives illustrate that recycling is seen to be the most important component of waste management, and all respondents, including those who do not participate in recycling schemes, believe that recycling has an important role to play in the management of waste.
A `waste ethic'

Schultz (1993) introduces the concept of a waste ethic when she discusses the role of women in German waste management, arguing that the waste ethic is spread through institutions for waste co-ordination, environmental information, churches, ecology groups, consumer associations, radio, television and schools. The role of the ethic is to
"...burden women with a guilty conscience if they do not correctly sort the rubbish and bring it to the proper bins" (Schultz, 1993:59).

The public are coerced to partake in recycling to some degree through communications which spread the notion of the ethic which explains that recycling is 'good' for the environment, and there are many communications which have led the public to believe that recycling is 'good'.

The perceived 'good' of recycling often relates to the concept that recycling is itself a cyclical process which leads to the continued regeneration of material. During the 1960s it was postulated by ecologists that the environment operated in terms of self-renewing cyclical systems. Because recycling gained its momentum from a broad base of environmental movements a common analogy arose between recycling and the 'environment' as a circular ecology. While ecologists have come to theorise the environment as a series of unstable and chaotic systems, the belief that recycling operates as a closed loop remains prevalent (National Recycling Forum, 1997). This closed-loop perspective (Figure 7.1) assumes that few new resources will need to be added for production to occur, and little pollution will result because the same resources will be used repetitively.
Closed-loop recycling is unachievable and recycling requires the input of both virgin feedstock and energy, as a consequence it is more appropriate to represent recycling as a cascade as shown in Figure 7.1. Paper, for example, is never recycled back into a premium product similar to the virgin product, rather it is recycled into a lower grade of paper until finally the fibres become so brittle and short it has to be discarded. This ‘cascade’ in recycling means that the process is far from being a self sustaining closed-loop, and resource usage and waste results from the process. Although this closed-loop perspective of recycling is not blatantly communicated through the waste ethic, artefacts of earlier ecological theories of ‘the environment’, and the ramifications this had on recycling, still circulate amongst individuals who believe recycling to be a ‘good’ activity with limited or no problems associated with it.

The central message of the waste ethic is that participation in recycling schemes will save resources and reduce the amount of waste going to landfill, and therefore, improve the environment, both now and for future generations. Many bodies have an interest in promoting and responding to this message, and for a range of reasons: waste management companies promote the message to stimulate more business; retailers use these messages to promote their ‘green’ credentials, and increasingly to help reach statutory targets set by the packaging regulations; local authorities need to encourage
public participation to meet recycling targets; and environmental groups and recycling bodies promote the waste ethic because they believe recycling is preferable to landfill and EfW.

All of these bodies have an interest in communicating the waste ethic which currently focuses on recycling and coercing the public to participate in recycling. The effect of the waste ethic, therefore, is to place responsibility on the individual to act as a local 'steward for the environment', and individuals themselves may subscribe to such views to demonstrate their environmental concern and to ease their 'green guilt'. The often quoted environmental phrase *think global, act local* summarises the waste ethic which communicates the idea that domestic waste management, through collection for recycling, has global environment ramifications. *Captain Planet*, a fictional character used to promote recycling in national campaigns, states “The best way to deal with waste is to recycle it! Don’t forget, Planeteers, the power is yours!” (Treneman, 1992).

*Figure 7.2: Captain Planet*

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For example, Devereux (1998:14) explains: “All of those involved [in the packaging regulations] agree on the importance of greater consumer awareness as an essential prerequisite for a higher level of packaging recovery from the domestic waste stream”.

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72 For example, Devereux (1998:14) explains: “All of those involved [in the packaging regulations] agree on the importance of greater consumer awareness as an essential prerequisite for a higher level of packaging recovery from the domestic waste stream”.

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All householders produce waste and therefore have the ability to participate in waste management. This participation is pursued by institutions communicating the waste ethic, and individuals in this study demonstrate that they have been affected by the ethic, since they believe that recycling helps to solve environmental problems such as 'the destruction of forests' (Chapter 6).

This thesis demonstrates that householders have a clear preference for recycling, and this is often driven by messages such as that delivered by 'Captain Planet' because individuals believe that recycling is 'good for the environment'. Yet, representations such as Captain Planet clearly communicate the perspective that householders are expected to recycle, and this is reinforced through the use by producers of symbols printed on products to remind the consumer that they have the 'power' to recycle if they want to. Many people respond to this by participating in recycling because they have been indoctrinated to some degree with the waste ethic which urges them to recycle.

As well as serving to inform the public about recycling, these packaging symbols can also serve to confuse the public. Although the packaging industry claim to have a standard protocol for product symbols, there is often ambiguity as to the exact meaning of symbols (Bickerstaffe, 1996:22). For example, the main recycling symbol, composed of three arrows forming a triangle, can mean either that a product is made from recycled waste, or that the product is potentially recyclable. Equally, the use of symbols is sometimes contradictory. Many drink cans display the "Keep Britain Tidy Symbol" (which shows a person throwing waste in a bin) close to recycling symbols. This problem is illustrated in Figure 7.3 where the lager can displays four symbols relating to waste management.
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Figure 7.3: The contradictory usage of packaging symbols on a lager can

It is not surprising that the average householder is perplexed by packaging symbols. Chapter 6 briefly discussed the various meanings respondents attributed to the four packaging symbols which were included in the questionnaire of this study (Appendix M). Eleven different understandings each were given for the ‘Green Dot’, ‘recycling’, and ‘Keep Britain Tidy’ symbols, and 10 separate meanings were given for the ‘please recycle’ symbol. From the producers perspective, it does not matter if a packaging symbol is ambiguous, or contradictory as long as the general message communicated is that the product and/or package is environmentally sound.

It becomes clear, therefore, that the development of a ‘waste ethic’ effectively transfers much of the immediate responsibility for waste to the consumer through a range of communications. The analysis of these types of communications, through an in-depth analysis of householders views on waste management, is important because they illustrate that some of Cleveland’s residents make statements about the ‘environment’ by recycling. However, further explanation is required to disclose why, and at what level waste is seen to be an ‘environmental’ issue.
7.3.2 Views of environmental scale

The perspectives derived from Q illustrate the extent to which individuals perceive waste interacting with the environment at different levels. These perceptions are important because they inform the three key relationships between individuals and waste management discussed below. Figure 7.4 is a schematic representation of the three perspectives derived in this study and the ways in which people with these views link waste and the environment.

*Figure 7.4: Perspectives of waste and the environment at different scales*

The mark at the centre of each of the above representations illustrates the individual, and the shapes represent different environmental scales at which these people perceive waste to be an issue, or problem. The thickness of the lines in each diagram represent the degree of association to which individuals perceive that the management of waste interacts with the environment. For example, the Apathetic NIMBY group do not associate the problem of household waste with environments above the level of Cleveland, and so only show an association up to this level. The different perspectives are now discussed.

Incoherent Environmentalists make a strong link between individual actions and the global environment, and the problems associated with it such as global warming, atmospheric pollution, and habitat destruction. They believe that everyone should be concerned about waste because it has a significant impact on the global environment, these people associate waste with popular images of environmental destruction. For example, EfW and landfill are perceived as ‘waste problems’ which contribute to the
degradation of the global environment, whereas recycling is seen to ameliorate global environmental problems, such as resource depletion and global warming. People with this view perceive waste as a problem which stretches from the 'street corner to the stratosphere' and no particular consideration is given to any scales between these extremes because household waste and issues relating to the global environment are inseparable. This is illustrated in Figure 7.4 with the individual situated within the global environment with only weak associations with the environment at a regional scale.

Acquiescent Participants perceive waste as being primarily a regional environmental issue. However, these people also believe that the global environment is affected by waste, but the link is remote and less clear than for Incoherent Environmentalists. Acquiescent Participants still have an understanding of global environmental issues, but a less direct link is made between waste at the household level and frequently communicated global environmental problems. Instead, a practical and regional perspective is taken to the problem of waste management, for these people waste arises in Cleveland, and therefore, it is seen to be a Cleveland problem demanding a regional solution. In light of this Acquiescent Participants think recycling is extremely important, but equally it can co-exist with EfW, which is a good regional solution to waste management. EfW is viewed to be better than landfill, and it is not perceived to cause any local or global environmental problems, since the building of an EfW plant seems an unremarkable addition against the already heavy industrial landscape of Cleveland. This regional perspective to the waste problem does not, however, exclude broader environmental issues. For example, people with this perspective believe local recycling initiatives have important global ramifications because resources are saved. However, this perceived link between the regional waste context and the global environment, is not as strong.

Although Apathetic NIMBYs have some awareness of global environmental issues, they do not particularly link these issues with domestic waste. Instead, their primary concern is with the regional, or Cleveland environment, and more specifically their local environment, or neighbourhood. This perspective of scale is illustrated in Figure 7.4
with the emphasis on the environments immediately surrounding the individual. Yet while Apathetic NIMBYs believe that the regional environment is degraded, particularly in industrial areas such as Billingham, they do not associate this degradation with domestic waste. The strongest emphasis of scale for these people is with their immediate local environment which they want to preserve, even at the expense of degrading other people’s local environments. This very local perspective of scale is reflected in the fact that these individuals exhibit the NIMBY syndrome in waste management. This means that they take the view that as long as the problem of waste is dealt with away from their neighbourhood, then it is not a problem.

While the NIMBY phenomena has been shown to be an important factor in many waste siting and management decisions (Gould, et al., 1996 and Petts, 1995), it is not the principal concern for refuse management issues in Cleveland. The principal concern of Apathetic NIMBYs is to preserve their immediate environment from the threats they believe a waste facility would bring, such as smells, noise and visual impairment.

In light of this it is interesting to note Gould et al.’s (1996:3) observation on NIMBY: “The NIMBY label implies that local activists are selfish, materialistic and often naïve and uncosmopolitan ... the label “NIMBY” negate[s] the strategies, tactics and contexts of local citizens struggling to protect their... rights”. Clearly the NIMBY syndrome for Apathetic NIMBYs does not extend to a tactical struggle as Gould et al. suggest, but is centred around a desire for the preservation of their immediate environment, possibly at the expense of another neighbourhood a few miles away.

The only area in which this perspective extends to the NIMBY phenomena which Gould et al. (1986) describe is when a NIMC(hildren)sBY syndrome is hinted at. Here the concern is not necessarily with their own local environment, but with the idea of protecting the ‘environment’ for the benefit of future generations.

These perspectives of household waste and the levels at which waste is perceived to interact with the environment at different scales, interact with the ‘waste ethic’ and the politicised nature of waste to form three important relationships between the
householder and waste management strategies. These relationships are discussed in the next section.

7.4 Human-environment relationships in household waste management

As shown, the perspectives revealed by this study illustrate how individuals perceive waste management and its impact on the environment. These perspectives illustrate how different individuals relationships are either in accord, discord, or indifferent to their waste management context. These views are important to this discussion because they help to explain the politicisation of waste which shapes management ideologies.

7.4.1 Discord with waste management

People with perspectives like those communicated by Incoherent Environmentalists are engrained with an atavistic notion that all management strategies involving incineration are necessarily 'bad' (probably stemming from earlier experiences with polluting incinerators such as Portrack), and all those involving recycling are 'good'. This polarised perspective of EfW and recycling results from a belief in the 'good' of recycling, which is communicated through the waste ethic, and a continuing association between old and new incinerators. Modern EfW plants are believed to be as great an environmental hazard as old waste incinerators, such as the one built at Portrack in the 1970s.

This polarity is reinforced when these people's perspective of environmental scale and waste are brought into account because Incoherent Environmentalists link recycling with the preservation of the global environment in a non-specific way. There is a belief that collecting waste for recycling will lead to non-specific global environment benefits, and little thought is given to local or regional logistics, or practicalities of waste management. While these householders are able to make a conceptual link between themselves, their waste and wider environmental concerns, they have less awareness of the connections between their own waste management activities and actual waste management strategies which operate in Cleveland. These people are, therefore, globally far-sighted but regionally myopic. This means that they are influenced to a
great extent by the broad political economic circumstance, but do not realise these influences at a practical regional scale. For example, these people believe recycling to be the best solution for waste, while arguing that waste should not be incinerated. However, they are not aware that Cleveland’s recycling rate is very low (3%) and is unlikely to significantly increase due to the fact that CWM has signed the local authorities into a long term waste management contract with a minimum tonnage (‘must take’) clause for EfW.

This perspective is particularly interesting because it suggests that householders are influenced by the waste ethic to the extent that they prefer recycling over all other management techniques. However, they are unaware of their regional circumstances which could prevent them from attaining their waste management goal, which would be to recycle the majority of waste. As a consequence, the aspirations of these people are most constrained by waste policy, but these constraints are not appreciated because they are unaware of the regional waste management strategy. People with these perspectives are most constrained because in Britain the collection and management of waste is managed regionally, and as a consequence the ability for individuals in a given locale to participate in waste management will be affected by regional interpretations of national waste policy and the waste hierarchy. It is clear, therefore, that the intentions and aspirations of Incoherent Environmentalists are at odds with the Cleveland waste hierarchy discussed above.

7.4.2 Indifference to waste management

Despite the popularity of recycling amongst the respondents in this study, it is a fact that Britain has a low recycling rate and in general, the public find recycling inconvenient (Friends of the Earth, 1992a). In addition, there is still a section of the population who do not think, or care about their waste as long as it is collected from the street. These two views have been communicated in this thesis by the Apathetic NIMBYs who like the idea of recycling, but do not participate, and they do not care about waste management as long it is not in their immediate vicinity. This perspective is important because it explains an important relationship between householders and their waste.
Britain has to achieve demanding recovery targets in the coming years, while also managing waste in accordance with the principles of the waste hierarchy. Even with higher rates of recycling it is unlikely that Britain will meet its national targets, and equally recycling is not always the BPEO in the waste hierarchy. As a result of low recycling rates Britain is promoting EfW to increase the national rate of recovery while also reducing the amount of waste being landfilled. This trend towards EfW is in part a political response to a failure at the household level to collect materials for recycling. This failure has meant that EfW facilities are necessary for Britain to meet national targets.

Ironically, individuals who distance themselves from waste management, giving it very little thought, have significant influence on national waste policy through their inaction. This is particularly the case with EfW which, unlike many recycling schemes, requires no further participation for waste to be managed effectively and value recovered. These properties of EfW have led Britain to promote its energy from waste programme.

Individuals with an indifferent perspective of waste management, can therefore, shape waste policy due to their lack of involvement or interest. However, this indifference may switch to active protest if they perceive waste facilities as a threat to their immediate environment. A NIMBY perspective amongst individuals with an indifferent perspective about waste is significant because locational issues have been the single greatest barrier for EfW developments. Therefore, this perspective presents an interesting paradox, as policy is not only shaped through apparent indifference, but the awakening of a NIMBY disposition can also have an influence, through opposition to siting proposals for waste facilities.

It is clear, therefore, that people who have a regional perspective of their environment but who are indifferent about waste management can have a significant influence on waste policy. Equally, this influence could increase to an active influence over waste policy if these people also exhibit a NIMBY tendency as is the case in Cleveland. Householders with this perspective clearly influence waste policy through non-participation, and they also have the potential (although not exclusively theirs) to
influence policy through actions to prevent waste facilities being located in their neighbourhood.

7.4.3 Accord with waste management

This thesis has illustrated a region where there was little local opposition to build a new EfW plant, and opposition did not occur despite many householders preference for recycling and disapproval of EfW. On first inspection, this lack of opposition could be attributed to a local indifference toward waste management. However, further investigation of these Cleveland perspectives reveals that EfW is preferable to landfill (see Table 7.2), which is perceived as a greater threat than EfW. This local perspective may have eliminated local opposition to EfW when householders understand that EfW can avoid high landfill levels. EfW, therefore, may be acceptable to the public if the alternative is a large landfill. This theory is supported by the fact that the H. J. Banks landfill, which is in the same neighbourhood as the EfW plant, faced a great deal of local opposition when it got to the planning stage.

While this explanation may account for a general accord with waste management in Cleveland, perspectives which suggest discord have been discussed above. In Cleveland, most appear to be in accord with waste policy, and the Acquiescent Participants in particular. However, further examination of the relationship between individuals with this perspective and waste management suggests that they accept Cleveland’s waste strategy on false premises.

Although Acquiescent Participants take a regional view of waste management, and accept the necessity of EfW, they still see recycling as the most preferable management method. For example, Acquiescent Participants feel that recycling and EfW would complement one another, with materials for recycling being removed prior to incineration. The view of Acquiescent Participants, therefore, reflects an integrated approach to waste management, such as that being introduced in Hampshire (Chapter 3). These people see the benefits of all management methods, but they feel that they should be implemented practically and with regard to the regional environment. According to
them, if these principles are adhered to then it should follow that the global environment benefits from pragmatic regional waste management (Figure 7.4).

The management strategy implemented in Cleveland, however, differs considerably from the way in which these people believe it to be, since the region's strategy is not integrated with recycling, but rather it is dominated by EfW (87%), then landfill (10%), and finally recycling (3%). Although Acquiescent Participants appear to be in accord with local waste management strategies, their belief of a balanced approach to waste is at odds in Cleveland where EfW dominates.

7.4.4 Moving beyond 'waste management'

It is clear from these discussions that individuals relate waste management to the 'environment' at different levels and for different reasons. The relationships between individuals and waste management helps to explain why household waste management continues to be a highly politicised issue. Yet there are number of issues raised which exhibit symptoms of a broader malaise within the political ecology of waste management.

Firstly, all of the perspectives in this study communicate a clear preference for recycling, although one group of people admitted that they do not participate in recycling (Apathetic NIMBYs). Although the remainder said they participated in recycling schemes, the rate of recycling in Cleveland and Britain as a whole remains low. Even if the arguments which question the benefits of recycling are ignored, it does not appear to be a viable option for Britain to rely on recycling to divert significant amounts of household waste from landfills. EfW would be a more appropriate means of diverting waste from landfills because the need for participation from householders is overridden.

Secondly, these perspectives on waste do not address the avoidance of waste, which is the fundamental issue at stake with waste management. Perspectives on the sources of waste, however, highlight a particular problem with the current economic system, the waste industry, and waste management policy. Reluctance to reduce waste at the source
of production is symptomatic of the current economic mode of production and therefore leads to the problem of waste legitimisation, and these issues are now examined in the following sections.

### 7.5 Source reduction

Source reduction sits at the top of the waste hierarchy, because avoiding waste creation eliminates any problems associated with disposal. Despite this preference for reduction at source much more political pressure is placed on recovering waste once it has arisen, particularly by recycling, and increasingly with EfW, rather than focusing on reducing wastes at source. For example, some commercial sectors (like the packaging industry), local authorities, and Britain as a nation all have recovery targets to meet, whereas no targets for reducing the amount of waste arising are in place. While this focus on recovery deals with short to medium-term waste management expectations, it does not address the fundamental issues required to deliver longer-term sustainability. The whole concept of waste management needs to be examined at a higher level to fundamentally, and therefore to critically challenge the concept of ‘waste’ and its management.

The source study discussed in chapters 5 and 6 illustrates four distinct perspectives on the origins of household waste. Despite the variability among the perspectives, a common theme overarching these viewpoints is the belief that there is too much waste, particularly packaging waste, arising in the home. Three of these perspectives argued that action should be taken to reduce the amount of waste which arises in the home. The other perspective, that of the Consumers, believe that the current system is adequate, and the amount of waste generated is merely an inconvenience. Cleveland householders, therefore, recognise the importance of source reduction in the waste hierarchy, but it is extremely difficult for them to take any action to reduce waste at source. This is in clear contrast to the situation regarding waste management, particularly recycling, where householders play a key role in waste management and are coerced to participate through the waste ethic.

Although householders are persuaded to play a central role in waste management, they are virtually powerless to take action to reduce waste at source. This support is lacking
because the dominant economic system necessitates waste creation in its current form.
Using packaging as an example, the growth in global trade has necessitated more
packaging to protect goods, and this packaging is manufactured for only one use
because it would be uneconomical to return it to source to be refilled. The proposition
is made, therefore, that current waste management perpetuates the problem of 'waste'
through the process of waste legitimisation.

7.6 Waste legitimisation

The nested scales of analyses used in political ecology are useful to examine and explain
the local implications of waste management strategies. However, it is at the higher
conceptual level where political ecology is most useful in this examination of the local
and global ramifications of particular waste management ideologies.

This thesis has explained how waste management has become increasingly politicised,
and as a result focus has been placed on diverting waste from landfill, primarily through
recovery technologies. Recycling has long been the focus of these technologies, but low
participation rates, high costs, and low landfill diversion rates have resulted in the
promotion of EfW as a means of recovery. Individuals are therefore coerced to
participate in recycling, and they are also implicated in the rise of EfW as a means of
diverting waste from landfills. Despite their demands for source reduction, householders
are implicated in the legitimisation of waste discussed below.

Producers argue that they can only deliver high quality goods from around the world to
the household if single-use packaging is used to protect and preserve these goods (see
Chapter 3). Despite their belief that this packaging is used to excess, householders still
purchase goods packaged in this way, arguing that they have no choice. A situation has
arisen, therefore, where the current means of production cannot or will not change,
because the cheapest means of production has been found, and householders cannot or
will not change their consumption patterns because they want particular products, or
cannot find an alternative in less, or reusable packaging (for the same price).

Historically, the dominant mode of production has not had a 'waste problem' because
waste was simply landfilled and there were limited controls on this as a means of
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Disposal. Recent pressure on landfill, however, means that this cost of disposal is rising, and legislative tools are in place which have set demanding recovery targets. Waste management techniques and legislative tools have been focused on recovery of value from waste, rather than the reduction of waste, because recovery does not require any significant changes to the current means of production. A simplified version of this argument is summarised in Figure 7.5.

Figure 7.5: Production, consumption and waste

Under the traditional system, production mostly relied on landfill to dispose of waste, while under the current system much of this waste is now diverted from landfill to be either recycled or have energy recovered through incineration. These processes produce materials or energy which substitute virgin materials and energy in the production process. Yet this transformation in the way waste is managed has occurred without any
fundamental changes to the dominant means of production\textsuperscript{73}. If the root causes of ‘waste’ were addressed then producers would have to interact much more closely with consumers in initiatives such as local re-use systems, in attempts to reduce waste arisings. The current production system, therefore, is divorced from the management of waste\textsuperscript{74}.

From a conceptual level, therefore, the waste problem is solved because waste is transformed into a raw material or ‘feedstock’ to be consumed in further production. Thus, the current waste management ideology which focuses on recovery serves to legitimise waste because the problem of ‘waste’ is conveniently bypassed. For instance, as Fairlie (1992:280) explains, recycling “offers business an environmental excuse for instant obsolescence”, and it is argued below that energy from waste provides better excuses for instant obsolescence than recycling.

Through recovery, waste is valorised and becomes a commodity which can be used in further production, recycled ‘feedstock’ is treated as any other commodity because it has to meet particular specifications, be competitively priced, and traded globally. EfW and recycling are central to the legitimisation process because they transform waste into a commodity, while waste management companies facilitate and stimulate this commodification process. This concept relates, in many ways, to the ‘second contradiction’ of capitalism as introduced by O’Connor (1988) and the CNS group.

Through the concept of the second contradiction of capitalism, O’Connor (1988) argues that the capitalist mode of production destroys the environment which is central to its continued reproduction. There are many examples where waste leads to environmental degradation, and the CNS group would argue that this invokes the second contradiction. However, the concept of waste legitimisation presented here challenges this theory and may require thinking by this group to be extended somewhat.

\textsuperscript{73} Obviously a great deal of work has been undertaken to reduce the amount of resources consumed in production through economising, but the fundamentals of production remain unchanged.

\textsuperscript{74} Even in areas where producer responsibility has been introduced, such as the packaging regulations, this division between production and waste is maintained because mechanisms are put in place (such as PRNs and compliance schemes) which enable producers to purchase their waste responsibilities without addressing their packaging use, manufacturing processes, or resultant waste streams.
The second contradiction argues that the creation of waste leads to the degradation of the environment and thus the means of production are put at risk. However, the proposition made here, that waste management leads to waste legitimisation, challenges this ‘contradiction’. Through waste legitimisation, the second contradiction is overcome because waste is transformed into a resource, such as electricity, which is used again in production. In producing electricity some of the environmental degradation associated with waste, which would have contributed to the second contradiction, is avoided through the commodification of waste, which transforms ‘waste’ back into a resource. The second contradiction is, therefore, overcome to an extent with modern management practices such as recycling, and particularly EfW, which converts ‘waste’ back into a resource.

7.6.1 Legitimising waste with EfW and recycling
The main way in which individuals are implicated in waste legitimisation has been discussed in the first part of this chapter. As this study illustrated, householders believe that recycling is a useful means of recovery, and the local pressure to recycle is implicated in the politicisation of waste, leading to further growth in recycling schemes. On the other hand, participation in recycling does not necessarily follow this enthusiasm for recycling, and a consequence of this has been the development of EfW plants. Because individuals, with the help of environmental groups, have criticised landfills (while promoting recovery as opposed to reduction), they are implicated in waste legitimisation.

Since Britain demunicipalised waste management services, private waste management companies have quickly developed as key local authority waste management providers. Waste management companies are like any other businesses in that they are motivated by profit. Although landfill is still a profitable business (Biffa (1997) value the landfill assets of major British WMCs at £4.1 billion), increasing pressure to divert waste from landfill, via management strategies based on recovery, provides private waste management companies with increasingly profitable business. By the very nature of their business, the private sector waste industry does not seek to minimise the generation of waste. This is clearly demonstrated in Cleveland, where CWM have a 25
year waste management contract which demands more waste than the local authorities collect from households. The structure of the private sector waste management industry, therefore, legitimises the production of waste because it is the basis of their business and hence profit. Recycling and EfW both play a role in legitimising waste because they convert waste into a commodity which can be used again for further production. However, energy from waste is more efficient than recycling at legitimating the production of waste for five key reasons.

Firstly, recycling is presently limited to materials which are easily separated from other materials, of high quality and have a low level of contamination. For household waste this means that only a relatively small proportion is easily recycled. For example, Hampshire’s project Integra plans to recycle 26% of MSW, and ‘bring banks’, MRFs, kerbside collection, and composting technologies are used to facilitate this. In contrast, EfW mass-burns all MSW, regardless of materials, quality, or contamination and in so doing recovers energy. In Cleveland, this means that energy is recovered from all combustible domestic waste, with steel being recovered from the bottom ash. In addition, there are plans to recycle ash into aggregate and this will further increase the total recovery performance of EfW to approximately 80% (Northumbrian Environmental Management, 1998).

Secondly, as discussed throughout this thesis, EfW plants require long term contracts which include a must-take minimum tonnage. This case study has illustrated that the local authorities in Cleveland have insufficient waste to meet this minimum target. Therefore, to avoid paying the penalty clauses which result from default of the must-take, these authorities are forced to practice waste maximisation, rather than minimisation, for the next 25 years. Although minimum tonnages and long term contracts are a necessary component of waste management, inflexibility and inappropriate tonnage requirements lead to the legitimisation of waste production, not minimisation.

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77 In the first year of the contract the authorities fell 11,500 tonne short of the minimum tonnage (Dixon, 1996). It is likely that this shortfall will increase since Cleveland’s population is predicted to decline well into the next millennium (INFOS, 1996) and as people are encouraged to recycle, more waste will be taken to bring sites.
Thirdly, once an EfW plant has been constructed it has a high demand for waste and operators will seek to satisfy all of this demand by bidding for waste contracts and thus maximising revenue from the gate fee and electricity sales. Operators can attract waste contracts because the gate fee is competitive with landfill, but more importantly because EfW is marketed as a renewable source of electricity. Energy from waste provides a convenient and ‘environmentally sound’ means of disposing of waste, and therefore legitimising its production.

Fourthly, in addition to its environmental marketing potential, the energy generated from EfW plants also has a marked advantage over recycled products. Many recycling initiatives are limited by the demand for the end product (National Recycling Forum, 1997). EfW, however, is not limited by this factor because “energy is a convertible currency” (Strange, 1994a:2) which has an ubiquitous and ever increasing demand.

Finally, EfW has greater waste legitimising potential because many of the costs associated with this recovery technique are hidden, whereas the costs of recycling are more obvious. For example, the new EfW plant at Cleveland will be recovering value from approximately 80% of the household refuse produced in the county. To achieve this rate residents have to make few, if any, changes to their refuse routines. To achieve a similar recovery rate through recycling would require every home in the county to participate in substantial recycling activities. As a means of recovery, energy from waste is relatively ‘pain free’ when compared with recycling, therefore, the continued generation of waste can be legitimated since householders do not have to participate in recovering value from waste.

Energy from waste is a convenient and efficient means of processing a complete waste stream, and in the process recovering a product which is increasingly demanded and has a positive value. It is argued here that this property of EfW leads to an economic demand for waste, and it justifies the continued production of single-use products, thus maintaining the division between production and waste generation. In terms of its contribution to long term sustainability, EfW is summarised by the refuse management

Authorities in the USA have experienced similar problems with “put or pay” contracts where heavy fines have resulted (Horton, 1995:6).
company *Biffa* (1993:16) who entitle a discussion on the merits of EfW: “Burning the evidence”. Through its convenience and energy generating properties, waste incineration with energy recovery diverts attention from the key waste management issues relating to source reduction, which need to be addressed if long term sustainability is to be attained. Cooper (1994b:19) explains that recycling “will prove an obstacle rather than a stepping stone if it detracts attention from the more fundamental changes that are now required to reduce the excessive throughput of energy and materials in our economy”.

### 7.7 Political ecology

In placing the householder centrally in this multi-scaled approach to analysing human-environment relations (see Figure 2.1), this political ecology has illustrated that individuals both influence and are influenced by the broader political economy. These influences have been revealed through an examination of the political economy of waste at broader levels, and, with the application of Q Methodology, it has focussed on the perspectives of individuals at the level of the household. In his analysis of political ecological perspectives of soil degradation in Bolivia, Zimmerer (1996) points out that such household views are important to “renew a consideration of local knowledges and peasants’ personal or “everyday” perspectives on the soil erosion dilemma as part of an effort to invigorate political ecology through the analysis of discourse” (p.112). In a similar way, local knowledges of waste issues in Cleveland have illustrated that perspectives of waste and its management at the household level are often different from those at other levels and are thus vital in attaining a more holistic appraisal of human-environment relationships in the region.

Many political ecology studies have focused on agrarian societies, which are situated in degrading and hazardous local environments, and explanations are often based on poverty and uneven development (Peet and Watts, 1996). Despite these differing contexts of study, it has been possible to adopt the theoretical framework of political ecology to examine a developed world issue. In the same way that Blaikie and Brookfield (1987), argue that political ecology is necessary because “the individual ‘land manager’ cannot be viewed in isolation from the social relations of production,
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or... means of production”, waste cannot be viewed in isolation from the householder, the social relations which lead to the production of waste, or the means of production which influence the origins of waste.

While the theoretical approach of political ecology has been applied in this developed world context with a degree of success, comparisons with many political ecology works are difficult for a number of reasons. This study is non-land based, it examines a non-resource issue (waste), the local environment in Cleveland is not particularly hazardous, and it is becoming less hazardous as many of the region's industries adopt higher safety standards. Finally, explanations based on poverty are less relevant because household waste, and the problems associated with it, increase as societies become more affluent.

In spite of these important differences, this application of political ecology has added to explanations of waste and its management by positioning “people, places, and practices in relation to broader processes of social and economic change at the global and local levels” (Jarosz, 1996:148). In examining household waste from a political ecology perspective, this thesis has revealed a number of themes which help to explain how individuals and communities are integrated into the political economy of waste (Peet, 1998), and these need further discussion.

Firstly, as Jarosz (1996:149) explains, “the political ecology perspective advocates placing human activities and regional change in concrete spatial and historical contexts”, and many studies have illustrated the worth of employing such contexts (Zimmerer, 1996; Blaikie and Brookfield, 1987; Black, 1990; Bassett, 1988; and Cronon, 1992). In this analysis, the historical context of waste is an important component in understanding local human activities. For example, environmental movements have historically contributed to household waste becoming an important global issue. This wider trend contrasts with the waste situation in Cleveland which has been influenced by its heavy industrial past. This historical context of the Cleveland environment has meant that domestic waste is somewhat of a ‘non-issue’ when compared to its impact in other regions (Petts and Eduljee, 1994). This can be attributed to the fact that Cleveland’s residents have lived within a heavily industrialised area for many years (see Chapter 4). In addition to this industrial legacy, residents have also
Chapter 7: Discussion

experienced waste incineration for many years prior to the introduction of the EfW facility.

Secondly, the politics of ‘the environment’ and resource use are particularly important to political ecology, both from the level of the peasant household to the politics of the World Bank, the IMF, and international NGÔs (Batterbury, 1997; Muldavin, 1996; and Carney, 1996). While some commentators criticise political ecology approaches for lacking political analysis (see Peet and Watts, 1996, for discussion), this thesis has demonstrated the importance of politics in understanding household waste issues. In addressing politics, this discussion has revealed the politicised nature of waste, the ‘environment’, and the management of waste, and the ways in which individuals are enmeshed in the politics of waste.

Individuals are influenced, and in turn influence established political structures, such as waste management policy. However, they are also integrated into the reproduction of discourses such as the ‘waste ethic’ which focuses on coercing the public to recycle. Despite the aspirations of householders to recycle and reduce the sources of waste, there is little to suggest that they are empowered to either recycle as much as they would like, or to reduce the amount of waste created in their homes. While this would suggest that individuals are only influenced by the political economy in which they are situated, there is evidence that individuals can influence the wider political economy. For example, householders have contributed to the renaissance of waste incineration in Britain because their recycling aspirations do not match their actual behaviour in this form of waste management. Equally, the contempt for landfill amongst householders has contributed to the current political agenda which supports the almost universal ideology to reduce the amount of waste being landfilled.

The waste hierarchy is politicised at the EC, national, regional, and local authority level, and as a consequence this leads to a lack of consensus on the best practicable environmental option (BPEO) for waste management in Cleveland. This politicisation reveals that different parties appear to manipulate the hierarchy in different ways. In Cleveland, for example, the county council believed a regional solution, which did not rely on landfill, or recycling, was most appropriate. However, these decisions were
dropped by a private waste management company who were very keen to construct and operate an EfW facility and, therefore, enter into a partnership with the county council. The waste management company's incentives to build and manage an EfW plant are related to profit which is generated through the management of a 25 year contract.

Parallels can be drawn between this enthusiasm for the private waste management sector to impose large waste facilities in a region, and the land management techniques which have been imposed by Western development organisations in Third World countries. For example, Third World political ecology studies have illustrated how local land management techniques have been changed through the introduction of inappropriate intensive farming methods which have resulted in land degradation. In a similar way a large private waste company has driven the county council to agree to the construction of a large EfW facility which has a demand greater than the county's domestic waste arisings. While the WMC profits from the EfW plant, the residents of Cleveland have to live with an additional industrial facility which brings real and perceived risks, to the region, but particularly to the already deprived CWT. This facility was constructed against the will of the local authorities who believed it to be an inappropriate solution for the county, and equally, this study has revealed that some groups of individuals share this view.

The manipulation of the waste hierarchy continues as new areas of the economy, which were previously beyond the jurisdiction of waste management policy, are enveloped. For example, the politicisation of packaging waste has meant that Britain’s packaging producers have legal waste recovery obligations. This means that these producers and their representatives (such as Valpak) will become increasingly involved in waste management, and the inevitable manipulation of the hierarchy, so their obligations can be met in the most cost effective fashion.

A final theme which helps to explain the ways in which individuals and communities are integrated into the political economy relates to the concept of waste legitimisation. Individuals, households and whole communities are implication in the legitimisation of waste through waste management, however, the associations are stronger with the legitimisation of waste though recycling than with EfW. This is because it is essential
for the public to participate in collection for recycling if this form of management is to legitimise waste. Energy from waste, on the other hand does not require the participation of the individual for legitimisation to occur and as a consequence this form of management legitimates waste more effectively.

7.8 Summary

The examination of the interrelations between humans and their environments, and the extent to which communities are integrated into the political economy, are central issues for this approach to waste management. This chapter has illustrated the complexity and varied nature of these relationships, and their manifestation at many different levels. These interrelations have been shown to share some common themes with Third World political ecology studies from which this theoretical approach originates.

The Cleveland case study has revealed that waste management issues are contested at many political levels, as demonstrated by the various interpretations of the waste hierarchy. Equally, the environment at the local, regional, national and global level is perceived by individuals as being implicated, in differing ways, in waste management. Finally, the concept of a waste ethic illustrates how a dominant discourse circulates which promotes recycling above most other waste management strategies. These factors serve to shape, and are in turn shaped by, individuals who are in accord, discord or indifferent to waste management issues.

Despite these complex interrelations it is posited that all parties who are involved in waste management, from the householder to the international waste management business, are all implicated in the legitimisation of waste. The legitimisation of waste runs throughout waste management, and it is argued that this legitimisation is necessary for the continuation of the current means of production which relies on waste creation as well as resource consumption.
8. Conclusion and recommendations

8.1 Introduction

This study has performed a detailed examination of the complex interrelationships between individuals and various organisations in the contested and shifting arena of waste management in Cleveland. Against the backdrop of the rising crisis in the management of waste, the thesis has considered the implications of waste and its management in connection with the increased utilisation of energy from waste incinerators. The analysis has considered a wide number of factors which influence the management of domestic waste, ranging from the household, where waste both arises and begins its initial stage of ‘management’, through to the wider political economy of waste management which legitimates the production of waste.

8.2 Energy from waste in Cleveland

In examining the incineration of waste in Cleveland at a range of analytical scales, from the perspective of the householder, to the level of the global economy, a number of complex relationships have been revealed. It has been argued that many of these relationships culminate in the legitimisation of waste, primarily because the waste hierarchy has been interpreted in a fashion which authorises the continued expansion of the current means of production.

Since the late 1960s waste management has risen up the political agenda, and this rise has been punctuated with legislation such as the COPA (1974), and the EPA (1990). The ascent of household waste on local, regional, national and global political agendas has resulted from a broad consensus that landfill expansion must be minimised or contained. To maintain the controlled disposal of waste, coherent management ideologies are introduced which advocate modern EfW and recycling facilities, thus diverting waste from landfill.

Much of the pressure to divert waste from landfill was applied by proponents of recycling who believed that “waste was the resource of the future” (Curzio et al.,
Chapter 8: Conclusion

However, the falling costs of virgin raw materials on the global marketplace, expensive recycling schemes, and low public participation rates have all meant that waste managers and governments have looked for alternatives to recycling. Although Britain has in the past, employed incinerators to recover energy from waste, it was not until the 1970s in Europe, and the mid 1980s in Britain, that modern EfW facilities began to be utilised as a means of diverting waste from landfill, while also recovering value from waste.

Like many urban areas in Britain, Cleveland has experienced waste disposal problems for a number of years. As a consequence, the county council decided to construct a new EfW facility to replace the old incinerator. This decision has been contested by local authorities, who believe EfW to be an inappropriate means of managing the region’s waste. Despite this protest, the public in Cleveland did not appear to form coherent opposition to protest about this plant.

8.2.1 Householders and perspectives of the environment

A central aim of this political ecology has been to examine individual perspectives of waste and the environment within a region which has experienced waste management difficulties for a number of years, and as a result has decided to construct a new EfW facility to ameliorate these difficulties. The lack of local opposition in Cleveland is interesting in light of the fact that a number of plans for EfW plants around Britain and elsewhere in the world have been contested by grassroots groups.

On examination of the relationships individuals have with their waste and the environment, a number of different perspectives revealed the extent to which householders associate the problem of waste with different environmental scales. The discussion illustrated the factors influencing individuals and society, and also the extent to which they are integrated into the political economy of waste. Although the ways in which individuals relate waste to the environment are complex, and often exhibit a considerable degree of plurality, this analysis managed to clarify some of the human-environment issues relevant to waste and its management. Yet emerging from these
relations is the legitimisation of waste which permeates all levels from the individual to the global economy.

8.2.2 Householders and the legitimisation of waste

The local perspectives of Cleveland’s householders revealed that some people are in accord, others in discord, and a third group who are indifferent to Cleveland’s waste strategy. Associated with these attributes, the different perspectives of waste and the environment reveal that householders, in different ways, influence the broader political economy of waste management and in turn are influenced by it. Nevertheless, the overall conclusions seems to be that individuals are implicated in the legitimisation of waste.

Individuals who believe that the Cleveland EfW plant is an inappropriate management strategy because it inhibits recycling are implicated in the legitimisation process because recycling also legitimises waste. Equally, individuals who are indifferent to, and also those who are in accord with the Cleveland waste strategy, are associated with waste legitimisation. This is because they either are not particularly interested in their waste (as long as it is taken away), or they want a balanced approach between recycling and EfW. As a consequence, the focus on recovery, rather than reuse, or source reduction, by both the waste industry, and waste policy, means that, on the whole, individuals will always be implicated in the legitimisation of waste. They are coerced and involved in this legitimisation through discourses such as that communicated by the waste ethic.

The concept of waste legitimisation is global, and the fact that Cleveland’s householders are implicated in this legitimisation would suggest that many more householders across Britain, and the rest of the developed world are implicated in this mechanism for sanctioning the current means of production. Thus, the management of household waste, through focusing on recovery ideologies, leads to the further legitimisation of waste. It could be argued, therefore, that the management of waste sanctions the current means of production. As a necessary condition for continued viability, current production methods rely on a division between production and the generation of waste, and this division is maintained with the current focus on recovery, rather than reuse or reduction.
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The householder, therefore, is partly implicated in the management of waste from the local level, which may involve participating in recycling schemes, through to the level of the global economy which relies on a system of waste management which legitimates waste. However, the research has shown that most individuals believe there is too much waste arising in the home, and they often blame the producer for this waste (especially packaging). This is a problem for producers since it threatens this convenient division between waste and production. As a result, the continued generation of waste is justified through claims (which probably have some truth) that the customer demands well-packaged goods, and strong arguments are made that packaging is necessary for the protection and preservation of products (see Chapter 3).

8.3 A political ecology of household waste management

This thesis has employed political ecology to examine human-environment relations in a developed world context. This is an innovative application of an approach which was originally developed from analyses of Third World agrarian resource use issues. Political ecology focuses on the perspectives of individual land managers, or householders, etc. In focusing on this micro-level of analysis this approach has adopted Q Methodology. The following sections briefly review the relevance of political ecology for examining waste in a developed world setting, while also examining the applicability of Q Methodology to a political ecology framework of analysis.

8.3.1 Political ecology

The multi-scaled approach of political ecology has proved to be an appropriate framework for this First World examination of waste, where a matrix of interrelationships operates across local, regional and higher scales. In particular, political ecology offered a means of examining the human-environment relations between the micro-scale of analysis and the global economy, analysing the levels at which the management of waste may interact with the householder. However, the approach is not without its problems and the key difficulty experienced in this thesis was identifying the relationships between individuals and the different levels of analysis. Because political ecology introduces many different factors in the analysis of
human-environment relations it is extremely difficult to identify and give substance to these key relationships.

On the whole, political ecology has provided useful guiding principles for examining human-environment relations in the developed world. However, many of the problems encountered here will only be clarified if this approach to human-environment relations is adopted in many more developed world studies.

8.3.2 Q Methodology

While ethnographic techniques are central to political ecology, this thesis attempted to broaden the narrow methodological base of political ecology by exploring a technique which builds on the traditional ethnography approach. Q Methodology has been introduced to the field of political ecology in this thesis in a new and innovative way, and this has revealed some successes and failings of the methodology.

Extending ethnographic techniques with Q has allowed participants to measure their own perspectives, with the aim of keeping the influence of the researcher to a minimum. In this study Q has successfully empowered Cleveland householders to emphatically express their perspectives about waste and the environment, allowing respondents to steer the agenda to a greater degree than may be the case with other methods. This, for example, is demonstrated by the fact that some respondents engage more with discussions of the origins of waste rather than the methods for its management. A second benefit of this method has been the detailed local perspectives it yields, and the ability to process these views into like ‘families’ or groups. This factor yielded some interesting perspectives as discussed in chapters 6 and 7. However, there were some problems with this methodology, and this can only be expected during the exploration of an innovative approach. A number of criticisms can be made.

Since Q is an intensive technique it provides a detailed perspective of a particular locale, but the necessarily in-depth nature of the approach meant that the researcher could not conduct a second Q survey to generate a comparative study. Furthermore, it could also be argued that the approach is too introspective and issues at a slightly broader level than the micro-level of analysis may be missed.
This methodology attempts to minimise the introduction of researcher bias by allowing respondents to measure themselves. However, the problem of interpretation re-emerges once the respondents have measured themselves and the factor analysis has been completed, since the researcher must still analyses and interpret these factors and make some judgements about them (as demonstrated in Chapter 6). While Q does avoid some of the influences which the researcher may have on the data, it may well introduce others elsewhere.

On the whole the approach does not seems to be very well suited to political ecology enquiry because it introduces a further degree of (often unnecessary) complexity to an already complex theoretical approach. However, the effectiveness of the methodology could be proven with further use in similar studies.

8.4 Recommendations and the future of EfW

A number of practical recommendations result from this analysis of the political ecology of waste management in Britain. Many of these recommendations result from studying EfW in Cleveland, where the facility was developed in a non-integrated fashion.

Firstly, the minimum tonnage ‘must-take’ components of EfW contracts need reviewing. The Cleveland situation clearly demonstrates that the tonnage demanded by the ‘must-take’ is too high, and this has implications for meeting aspirations in the waste hierarchy, while also leading to the continued legitimisation of waste. While it is appreciated that EfW operators need the ‘must-take’ clause as an element of a waste contract to secure finance, the performance of these contracts should be reviewed. A suggestion would be to implement ‘reverse’ performance criteria on the contract so that the minimum tonnage stipulated in the waste contracted decreased over time.

Secondly, the scale of EfW facilities needs to be addressed. Again, the Cleveland example illustrates that an oversized plant has been built which does not cater for only the region’s waste management needs, and as a consequence needs waste to be imported. The technology exists to build smaller and more regionally sensitive EfW facilities, but the barrier to the development of these facilities is financial, since finance
cannot be obtained on a small plant, which is not cost-effective (Porteous, 1997). As with the must-take clause, oversized incinerators have implications for the aspirations of the waste hierarchy, and like this clause, waste is legitimised through the introduction of over size facilities. Here it is recommended that the mechanism of financial support for EfW operators currently delivered through the NFFO is reviewed. Providing EfW operators with capital support, rather than additional revenue on the power generated once a plant has been commissioned, could lead to the development of smaller more regionally appropriate EfW facilities.

Thirdly, planning co-ordination is essential in regions when waste strategies are being formulated. The case in point here being the lack of co-ordination in Cleveland which means the county now has an oversized EfW facility and a landfill which will need to source at least half of its waste from outside the county (see Chapter 4).

This lack of planning co-ordination, the minimum tonnage contract, and the construction of an oversized EfW facility all compromise the aims of the BPEO in the waste hierarchy. While Cleveland will be dominated with an excess of EfW and landfill for the next 25 years, other regions could learn from these problems. Rather than choosing a single, dominant waste management strategy, it is important that an integrated approach is taken. Such an integrated approach should utilise a number of techniques which complement one another, while also trying to meet the aspirations of the waste hierarchy.

While it is important to consider all of these recommendations for future waste management strategies, there is one final, but important point which need to be made. All of the above modifications will lead to more regionally appropriate waste strategies which move waste management ideologies up the hierarchy. However, none aim for the top of the waste hierarchy, which involves reducing waste at source. Waste avoidance is an issue which needs consideration by both producers, and waste managers.

8.5 Future work.

Although a number of diverse perspectives were revealed in this study, there is significant potential to carry out further research. Such research needs to examine the
role of the householder in local waste management. For example, Schultz (1993) illustrates the ways in which individuals are involved in precycling and recycling, however, her work is not particularly detailed and further research could focus on the future expectations which will be placed on householders when recycling and recovery targets increase in the future (e.g. as a result of the Packaging Regulations).

Examining and understanding the motivations and preferences which drive an individual’s waste management actions will be essential if the future of recycling, (through increased participation in recycling), or the future of EfW (through lack of participation in recycling), is to be ascertained. Further research utilising a political ecology framework could unearth many more of these issues, and importantly situate them within the global economy.

8.6 Conclusion

Rather than aiming for waste reduction, British waste management practice and policy aspires to divert waste from landfill. To some, these actions signal an intention to move towards source reduction (which is at the other end of the waste hierarchy) and indeed many in the waste industry argue that diverting waste from landfill will meet the aspirations of the hierarchy. However, as this thesis has demonstrated, this focus on landfill diversion means that in fact, the ascent up the waste hierarchy stops at recovery. The waste industry, therefore, has developed a detailed waste recovery ideology, and from this ideology, energy from waste has emerged as an efficient means of managing and recovering value from waste. The approach taken here, however, has exposed that the ideology of waste recovery in waste management serves to legitimise the production of waste, which allows the current mode of production to continue without major change.

It is unlikely that the legitimisation process will be challenged because both producers and waste managers indoctrinate the public with the view that waste reduction is difficult, but waste recovery is the best means of developing a ‘sustainable’ waste management future. The ideology of waste legitimisation will not be challenged by governments, the waste industry, or producers, because the waste industry’s source of
business is waste, and producers require waste to be generated for the current global economic system to continue. Also, most western governments now favour non-interventionist economic models (laissez faire) and would not interfere in production.

While all waste recovery techniques legitimise waste, energy from waste is currently the best means for attaining this legitimisation because it transforms detritus into a clean and easily convertible currency which can be used in production once again. While EfW is a sensible means of diverting waste from landfill, it also has broader implications for waste legitimisation, and as such its expansion must be monitored in the future.
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Bibliography


Bibliography


Appendix A

Regulations for emissions from waste incinerators as required by EC Directive 89/369/EEC

<table>
<thead>
<tr>
<th>Emission</th>
<th>Plant size and emission limits in mg/nm³</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 1 tonne per hour</td>
</tr>
<tr>
<td>Total dust</td>
<td>200</td>
</tr>
<tr>
<td>Heavy metals:</td>
<td></td>
</tr>
<tr>
<td>- Pb + Cr + Cu + Mn</td>
<td>5</td>
</tr>
<tr>
<td>- Ni + As</td>
<td>1</td>
</tr>
<tr>
<td>- Cd and Hg</td>
<td>0.2</td>
</tr>
<tr>
<td>Hydrochloric Acid</td>
<td>250</td>
</tr>
<tr>
<td>Hydrofluoric Acid</td>
<td></td>
</tr>
<tr>
<td>Sulphur Dioxide</td>
<td></td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>100</td>
</tr>
<tr>
<td>Organics (as total carbon)</td>
<td>20</td>
</tr>
</tbody>
</table>
### Status of Britain's energy from waste incinerators

<table>
<thead>
<tr>
<th>Location</th>
<th>Operator</th>
<th>Tonnes per annum</th>
<th>Status</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coventry</td>
<td>Coventry &amp; Solihull Waste Disp</td>
<td>200,000</td>
<td>Upgrade complete 1997</td>
<td>Built 1975</td>
</tr>
<tr>
<td></td>
<td>Disposal Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nottingham</td>
<td>Global Environment</td>
<td>150,000</td>
<td>Upgrade complete 1995</td>
<td>Built 1973</td>
</tr>
<tr>
<td>Edmonton</td>
<td>SITA</td>
<td>500,000</td>
<td>Upgrade complete 1997</td>
<td>Built 1969 last upgrade 1972</td>
</tr>
<tr>
<td>Edmonton</td>
<td>SITA</td>
<td>130,000</td>
<td>Completion due 2001</td>
<td>Only London plant with planning consent</td>
</tr>
<tr>
<td>Sheffield</td>
<td>LAWDC</td>
<td>138,000</td>
<td>Upgrade complete 1997</td>
<td>Built 1976</td>
</tr>
<tr>
<td>Birmingham</td>
<td>Onyx Limited</td>
<td>360,000</td>
<td>Fully operational</td>
<td>Cost £95m</td>
</tr>
<tr>
<td>Billingham</td>
<td>CWM</td>
<td>250,000</td>
<td>Fully operational</td>
<td>CWM subsidiary NEM</td>
</tr>
<tr>
<td>Lewisham</td>
<td>SELCPH (consortium)</td>
<td>420,000</td>
<td>Completed in 1994</td>
<td>First new generation EfW plant in the UK</td>
</tr>
<tr>
<td>Dudley</td>
<td>MESE</td>
<td>90,000</td>
<td>Fully operational</td>
<td>Cost £30m</td>
</tr>
<tr>
<td>Stoke</td>
<td>MESE</td>
<td>180,000</td>
<td>Fully operational</td>
<td>Cost £30m</td>
</tr>
<tr>
<td>Wolverhampton</td>
<td>MESE</td>
<td>105,000</td>
<td>Fully operational</td>
<td>Capacity reduced from 170,000 tpa</td>
</tr>
<tr>
<td>Hampshire</td>
<td>Hampshire Waste Services (Onyx</td>
<td>360,000</td>
<td>Project involves 3 separate EfW facilities</td>
<td>Planning not yet obtained</td>
</tr>
<tr>
<td></td>
<td>Ltd)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#Colbrook</td>
<td>Grundon Waste Limited</td>
<td>250,000</td>
<td>Completion 2000</td>
<td>Fluidised bed technology</td>
</tr>
<tr>
<td>(Berkshire)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#Belvedere</td>
<td>Cory Environmental Ltd.</td>
<td>1,200,000</td>
<td>Currently mothballed</td>
<td>First planning application refused</td>
</tr>
<tr>
<td>Bolton</td>
<td>Greater Manchester Waste</td>
<td>130,000</td>
<td>Completion late 1999</td>
<td>Old plant built 1970 &amp; 80,000 tpa</td>
</tr>
<tr>
<td>#Avonmouth</td>
<td>LAWDC</td>
<td>100,000</td>
<td>Partner sought for</td>
<td>Upgrade could run for 5 years only</td>
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<tr>
<td>Dundee</td>
<td>Dundee Energy Recycling Ltd.</td>
<td>120,000</td>
<td>Upgrade of 70,000 tpa</td>
<td>Fluidised bed technology (first in Britain)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1970s plant</td>
<td></td>
</tr>
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</table>

# project suspended pending financing, legal agreements, planning etc.

Adapted from Cosslett (1996)
Appendix C

Interview Guide For in-depth Interviews

Much of the original material discussed in this thesis draws on a number of in-depth interviews conducted in Cleveland during 1995 and 1996. These interviews were undertaken with key policy makers, politicians, industrialists, academics and members of environmental organisations (see Appendix D). The following is the guide used for these in-depth interviews.

Definitions of waste

What is your understanding of waste?

What, in your opinion, are the main sources of waste?

*Cue: Ultimate sources, LCA of waste.*

Responsibility for waste

Where does responsibility for waste lie?

Where should responsibility for waste lie?

*Cue: Public/private sector, local or national government.*

Energy from waste

What are your general impressions?

Benefits and advantages of EfW?

Disadvantages of EfW?

Views of NEM and CWM?

Health fears relating to EfW?

*Cue: EfW versus recycle, emissions, costs, long term*

Recycling

What are your general impressions?

Benefits and advantages of recycling?

Disadvantages of recycling?

Role of UAs in recycling?

*Cue: Recycling versus EfW, economics, who responsible, markets*

Specific difficulties for waste management in Cleveland

Geographical limits

Industrial context
Socio-economic issues

Redevelopment

Local waste composition

*Cue: shortage of landfill, problems with Portrack*

The suitability of the national waste strategy to Cleveland

Discussion of the British and EC waste strategies

The importance of the NFFO for waste management

Discussion of the NFFO arrangements

Waste as a source of energy

Need for energy in Cleveland

*Cue: waste defined as renewable, economics with and without NFFO*

Public accountability

Ownership

Track record of NEM

Future implications

*Cue: public perception of privatisation, financing, long term contracts*

Long term views of waste management

New technologies

Minimisation

Integrated strategies

Long term perspectives of waste recovery

*Cue: 25 year contract, must-take proviso*

Public perceptions

Perspectives of public reaction to waste management

General perspective of public in relation to industrial developments

Health fears

Grass root protest groups

*Cue: involvement in recycling, reaction to Portrack extension*
### Appendix D

**in-depth Interviews**

In-depth interviews were conducted with the following people. Some names have been changed to ensure anonymity.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Organisation</th>
<th>Interview date(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>J. Green</td>
<td>Waste Regulation Officer</td>
<td>CCC Waste Regulation Authority</td>
<td>01.12.95</td>
</tr>
<tr>
<td>P. Whaley</td>
<td>Planning Officer</td>
<td>CCC</td>
<td>05.10.95</td>
</tr>
<tr>
<td>Mr Dyson</td>
<td>Planning Officer</td>
<td>Hartlepool Unitary Authority</td>
<td>11.11.95</td>
</tr>
<tr>
<td>A. Craig</td>
<td>Recycling Officer</td>
<td>Hartlepool Unitary Authority</td>
<td>20.11.95</td>
</tr>
<tr>
<td>K. Sherwood</td>
<td>Environmental Services Manager</td>
<td>Middlesborough Unitary Authority</td>
<td>20.11.95 15.10.96</td>
</tr>
<tr>
<td>L. Milne</td>
<td>Manager, Environmental Services</td>
<td>Stockton Unitary Authority</td>
<td>21.11.95 07.03.96</td>
</tr>
<tr>
<td>T. Crompton</td>
<td>Client Side Manager</td>
<td>Cleveland County Council (CCC)</td>
<td>22.11.95</td>
</tr>
<tr>
<td>J. Palmer</td>
<td>Campaigner</td>
<td>Stop Toxic InCineration In Cleveland (STINC)</td>
<td>22.11.95</td>
</tr>
<tr>
<td>B. McManus</td>
<td>Waste Manager</td>
<td>Able Environmental Ltd.</td>
<td>22.11.95</td>
</tr>
<tr>
<td>Mr. Hodgson</td>
<td>Waste Manager</td>
<td>County Durham Waste Management</td>
<td>23.11.95</td>
</tr>
<tr>
<td>A. Marson</td>
<td>Chair of Waste Sub-Committee</td>
<td>Environment City</td>
<td>23.11.95</td>
</tr>
<tr>
<td>G. Holmes</td>
<td>Campaigner</td>
<td>Friends of the Earth and Green Party</td>
<td>23.11.95</td>
</tr>
<tr>
<td>J. Calder</td>
<td>Portrack Inspection Officer</td>
<td>HMP</td>
<td>24.11.95</td>
</tr>
<tr>
<td>G. Moorhead</td>
<td>Recycling Officer</td>
<td>Stockton Unitary Authority</td>
<td>24.11.95</td>
</tr>
<tr>
<td>J. Charrington</td>
<td>Recycling and Education Officer</td>
<td>Cleveland Waste Management Ltd.</td>
<td>27.11.95</td>
</tr>
<tr>
<td>J. Ivan</td>
<td>Surveyor and campaigner</td>
<td>Teesside Tomorrow and Cleveland Chamber of Commerce</td>
<td>28.11.95</td>
</tr>
<tr>
<td>D. Vasey</td>
<td>Waste Manager</td>
<td>Langbaugh Unitary Authority</td>
<td>28.11.95</td>
</tr>
<tr>
<td>P. Goodwin</td>
<td>Campaigner</td>
<td>Green Party</td>
<td>29.11.95</td>
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<tr>
<td>C. Lee</td>
<td>Marketing Manager</td>
<td>ICI Process Plant Park</td>
<td>29.11.95</td>
</tr>
<tr>
<td>I. Pell</td>
<td>Chief Architect</td>
<td>Biomass Ltd.</td>
<td>29.11.95</td>
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<tr>
<td>R. Riley</td>
<td>Campaigner</td>
<td>Red Alert</td>
<td>29.11.95</td>
</tr>
<tr>
<td>K. Lindsey</td>
<td>Director</td>
<td>RESPOND</td>
<td>12.10.95</td>
</tr>
<tr>
<td>S. Evans</td>
<td>Chief Planning Officer</td>
<td>Teesside Development Corporation</td>
<td>12.10.95</td>
</tr>
<tr>
<td>Mr. P. Ford</td>
<td>Environment Officer</td>
<td>Hartlepool Unitary Authority</td>
<td>11.01.96</td>
</tr>
<tr>
<td>L. Paine</td>
<td>Campaigner</td>
<td>Friends of the Earth</td>
<td>02.02.96</td>
</tr>
<tr>
<td>F. Cook MP</td>
<td>MP Stockton North and Chairman</td>
<td>Labour Party</td>
<td>02.05.96</td>
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<tr>
<td></td>
<td>of the Parliamentary Renewable and Sustainable Energy Group</td>
<td></td>
<td></td>
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<tr>
<td>J. Garvey</td>
<td>Managing Director</td>
<td>Cleveland Waste Management</td>
<td>14.03.96</td>
</tr>
<tr>
<td>M. McNaully</td>
<td>LAWDC Client Manager</td>
<td>CCC Waste Regulation Authority</td>
<td>07.03.96</td>
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<tr>
<td>Cllr. D. Walsh</td>
<td>CCC Councillor</td>
<td>Chair of CCC Waste Management Committee</td>
<td>08.03.96</td>
</tr>
<tr>
<td>Name</td>
<td>Position</td>
<td>Organization</td>
<td>Date</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>D. Muir</td>
<td>Conservationist</td>
<td>Industry and Nature Conservation Agency (INCA)</td>
<td>09.05.96</td>
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<tr>
<td>Cllr. T. Woods</td>
<td>Mayor of Cleveland, Chairman of CCC and SBC</td>
<td>CCC and Stockton Unitary Authority (SBC)</td>
<td>11.03.96</td>
</tr>
<tr>
<td>C. Tarling</td>
<td>Manager/Partner</td>
<td>C &amp; G Reclamation</td>
<td>12.03.96</td>
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<tr>
<td>S. Linton &amp; J. Sale</td>
<td>Environmental Scientist</td>
<td>Visqueen Plastic Film</td>
<td>12.03.96</td>
</tr>
<tr>
<td>Cllr. A. McCoy</td>
<td>Councillor</td>
<td>Stockton Unitary Authority</td>
<td>12.03.96</td>
</tr>
<tr>
<td>Cllr. J. O'Donnell</td>
<td>Councillor</td>
<td>Stockton Unitary Authority</td>
<td>12.03.96</td>
</tr>
<tr>
<td>M. Munday</td>
<td>Head of Landfill Division</td>
<td>H. J. Banks</td>
<td>12.03.96</td>
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<tr>
<td>Cllr R. Liversidge</td>
<td>Chair Environment and Public Protection Policy</td>
<td>Stockton Unitary Authority</td>
<td>12.03.96</td>
</tr>
<tr>
<td>Cllr. Woodhouse</td>
<td>Councillor</td>
<td>Stockton Unitary Authority</td>
<td>12.03.96</td>
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## Emissions from the Portrack Incinerator (1996)

<table>
<thead>
<tr>
<th>Emission</th>
<th>STP (mg N m(^{-3}))</th>
<th>Stack Exit (g s(^{-1}))</th>
<th>Maximum Annual Release in Tonnes</th>
</tr>
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<tbody>
<tr>
<td>Total particulate</td>
<td>30</td>
<td>1.38</td>
<td>38.79</td>
</tr>
<tr>
<td>Organic compounds (as Carbon)</td>
<td>20</td>
<td>0.92</td>
<td>25.79</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>100</td>
<td>4.61</td>
<td>38.79</td>
</tr>
<tr>
<td>Sulphur dioxide</td>
<td>300</td>
<td>13.83</td>
<td>388.33</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>350</td>
<td>16.13</td>
<td>452.92</td>
</tr>
<tr>
<td>Hydrogen chloride</td>
<td>30</td>
<td>1.38</td>
<td>38.79</td>
</tr>
<tr>
<td>Hydrogen fluoride</td>
<td>2</td>
<td>0.09</td>
<td>2.52</td>
</tr>
<tr>
<td>Lead</td>
<td>1.0</td>
<td>0.05</td>
<td>1.404</td>
</tr>
<tr>
<td>Chromium</td>
<td>1.0</td>
<td>0.05</td>
<td>1.404</td>
</tr>
<tr>
<td>Copper</td>
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<td>0.05</td>
<td>1.404</td>
</tr>
<tr>
<td>Manganese</td>
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<td>0.05</td>
<td>1.404</td>
</tr>
<tr>
<td>Nickel</td>
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<td>0.05</td>
<td>1.404</td>
</tr>
<tr>
<td>Arsenic</td>
<td>1.0</td>
<td>0.05</td>
<td>1.404</td>
</tr>
<tr>
<td>Tin</td>
<td>1.0</td>
<td>0.05</td>
<td>1.404</td>
</tr>
<tr>
<td>Cadmium</td>
<td>0.1</td>
<td>0.005</td>
<td>0.14</td>
</tr>
<tr>
<td>Mercury</td>
<td>0.1</td>
<td>0.005</td>
<td>0.14</td>
</tr>
<tr>
<td>Dioxins</td>
<td>1 x 10(^{-9})</td>
<td>4.61 x 10(^{11})</td>
<td>1.29 x 10(^{-9})</td>
</tr>
</tbody>
</table>

*Data supplied by the Environment Agency*
Appendix F

Ethnographic Interview Guide

This interview guide was used for the ethnographic interviews, although it appears quite structured, this format was not adhered too, and once the interview was underway the guide was used merely to probe the respondent and to make sure no issues were missed. Probes are marked with bullet points.

Meanings/definitions/ideas of waste in general
- relation between industrial and domestic waste

Origins of household waste
- peelings, packaging, kitchen waste, anything leaving the house.

Level of participation in waste management
- bin day, all the time, in kitchen, when it smells

Waste reduction
- responsible parties, packaging, role of self, role of retailers, role of producers

Re-use
- returnable packaging, responsible parties, historical change

Recycle
- responsible parties, problems, bring system, kerbside system, sufficient coverage, space in home.

Incineration
- views of Portrack, health, pollution, EfW versus recycling, the role of EfW at the core of a waste management strategy.

Landfill
- perceptions, health, pollution.

Packaging waste
- necessary, need, hygiene, historical change, role of retailers and producers, environment.
NIMBY
- local perceptions, Teesside polluters, industrial context, landfill, incineration, recycling banks.

General environmental issues
- Greenpeace, Friends of the Earth, ozone, global warming, greenhouse.

Health issues
- asthma, cancer, hygiene, waste disposal.

These probes were only used after the presentation:
- ash disposal, new location, electricity, private sector, source of renewable energy, time scale, recycling versus EfW.
Appendix G

Presentation used for the Ethnographic Interviews

Please do not hesitate to interrupt if you would like to ask anything or if you do not understand any of the following.

At present, the people of Cleveland produce about 310,000\textsuperscript{76} tonnes of domestic waste in a year. Seventy per cent of this is incinerated at Portrack, the rest is recycled or buried in landfills. The current incinerator at Portrack is to be closed at the end of this year because it fails to meet stringent European legislation on air pollution.

As you may be aware, Cleveland County Council has recently set up a joint company with a subsidiary of Northumbrian Water called Cleveland Waste Management. This company is now responsible for the disposal of your household waste. As part of its programme the company has decided to build a new waste incinerator to replace the old Portrack incinerator. The new incinerator is to be built at the ICI Process Plant Park in Billingham, and like Portrack, it will continue to process the majority of Cleveland’s household waste. Unlike the old incinerator at Portrack, the new incinerator is promised to be “greener” because it will use the heat produced from burning Cleveland’s waste to produce electricity. Likewise, the new plant will have to conform with stringent European pollution legislation.

Waste incineration - which converts the heat produced into electricity - is a modern way of managing household waste. Unlike landfilling, waste incineration with energy generation harnesses the energy in wastes, such as paper and plastics. Household waste typically has 40 per cent the energy equivalent of coal and the new plant at Billingham will generate enough electricity for a town the size of Hartlepool. Incineration may also reduce dependency on fossil fuels, and possibly contribute to a reduction of the so called greenhouse effect. Old waste incinerators, like the one at Portrack, are often associated with pollution and toxic emissions. Modern plants, which incinerate waste at high

\textsuperscript{76} This figure looks high when compared to the figures discussed in Chapter 4, this is because CCC consistently overestimated the tonnage of household waste arisings and this was the best figure at the time this research was undertaken.
temperatures and have complex gas filtering facilities, claim to have very low emissions which cause no harm to the public or the environment. In addition to modern design, these new incinerators have the advantage of reclaiming some value from waste. Where recycling uses old materials as a raw ingredient for new products, incineration uses old materials to generate electricity. The government subsidises waste incineration in the same way as it subsidises wind farms, or hydro electricity, arguing that waste is a renewable resource. In the same way that paper recycling saves trees, waste to energy reduces the need to mine raw materials such as coal and gas for energy generation.

When waste is put into a landfill very little value can be reclaimed from it, and in some cases there are environmental impacts associated with landfills, such as the contamination of ground water, and the release of gases which are linked with global warming.

Waste incineration does not make waste go away, it is just a means of processing, and like any process, there are associated wastes. The main waste from incineration is ash. Like any fire, incinerators produce ash, both the ash which falls through the grate - bottom ash - and ash which the incinerator takes out of the smoke which is generated from the fire - fly ash. Both fly ash and bottom ash have to be disposed of in special landfills because they tend to have concentrations of toxic and acid materials in them. Although new incinerators have to comply with stringent emission levels, they still do emit low levels of toxic gases and particles. Although levels of pollutants such as dioxins, PCBs, and tiny dust particles called PM10s are low, there is still no evidence which proves that even small levels of these materials aren’t harmful to our health.

Bearing in mind that Cleveland has very few facilities for landfilling waste, energy from waste is a very effective means of reducing the volume of waste which is produced in the county. Energy from waste both produces electricity and reduces the amount of waste to be landfilled by up to 90 per cent. Although generating electricity from waste has a number of obvious benefits, it also raises a number of other issues. A new incinerator is very expensive to build, and for a private company to invest in a new plant it requires a guarantee that it will have sufficient waste to burn for the next 25 to 30 years. When CCC went into partnership with Northumbrian Water it signed a guarantee
which meant that the four local authorities have to provide the new incinerator with a minimum amount of waste each year. With the majority of Cleveland’s waste being incinerated, the argument has been made that other waste management practices such as waste avoidance and recycling could be stifled. While it has been proven in countries which incinerate the majority of their waste, such as Japan, that recycling and incineration are compatible, this has not yet been proved in Britain. This may lead to future tension between local authorities such as Stockton, which is aiming to increase waste recycling, and the company managing the incinerator which has ownership of the authorities waste.
Source and Disposal Q-sample statements

Source Q-sample (formatted for the Q statement cards):

Item number and statement

1 - Women spend most time in the kitchen, so they should be responsible for waste.

2 - More working women means that there is more convenience foods and ready made meals.

3 - There are so many ready meals in the supermarkets now that I don’t cook the same as I used to, I just get a ready meal and of course you’ve got all that packaging to throw out each time.

4 - I remember my childhood, when you knew the shop keeper, the shop was part of the community.

5 - All this packaging means that you have bags and bags for the bin men to take away and that in itself is an inconvenience.

6 - I am virtually forced to use supermarkets because they are so much cheaper than local shops.

7 - I think that all of the packaging on goods is necessary, it is not in excess.

8 - As a consumer I would have an effect if I made my feelings felt to supermarkets and chain stores, by not buying products which I disapproved of.

9 - You have to have a car to use the supermarkets.

10 - I find that supermarkets are a pleasant shopping environment, there is more choice and they save a lot of time.

11 - The people who are in a position to do something about excess waste, like Sainsburys and Asda, are not very interested in social welfare, therefore it would be difficult for them to downgrade their profits slightly in order to help society or the environment.

12 - Every time I go to the supermarket, the things that I buy will, within days, need to be disposed of.

13 - When I do my shopping I make economic decisions and buy the cheapest on offer.

14 - There is more waste now because we have supermarkets, and we don’t have a grocer weighing things out at the corner shop.

15 - Packaging is a big con job, you are getting a big box, so you think you are getting value for money, when you open it up its only a little portion, its just a con job.

16 - Packaging is unnecessary from the consumers point of view, it is necessary from the producers point of view who want to sell their product, so they are happier packing their produce in a brightly coloured box so it makes the goods look attractive.

17 - The size of packages don’t affect the rubbish I put out.

18 - I have moved away from what my mother and grandmother were like, which was to cook fresh vegetable every day, but then I don’t think I am the only one, we have taken advantage of convenience food because of the quickness.

19 - I think it is a bit of a contradiction when they put all these preservatives in food these days and yet they still have to have all this packaging to keep it fresh.
20 - All this fancy packaging does not affect the price of a product.

21 - I think the types of foods we have has changed packaging. For example, the margarine's you get today are very spreadable and have to be in a container.

22 - I am sure that if the box didn't offer any protection it would still be there for advertising purposes.

23 - When I buy food I like it in a box, I like to see a picture of the thing I am buying on the box. I like to buy what looks the way it should, and without packaging I don't feel that I am getting a good product.

24 - The amount of packaging that comes with products is just horrifying really. I don't think there is any need for it, I would quite happily just have the basic thing, without all of that.

25 - I sometimes buy things, and I think that the packaging must have cost more than the product.

26 - I think people are encouraged to replace things, like they are encouraged to replace their car every 2 years, and to have the latest gadget, even if their current one was working quite efficiently.

27 - It would be good if we weren't destroying trees just for the sake of packaging.

28 - I would say that over the last 10 years the amount of refuse has tripled because everything you use now is made to throw away.

29 - As a society we are more affluent now than we have ever been before which means we consume more, and I believe that the more we consume the more waste there will be.

30 - To me, progress is consuming more, and having more goods.

31 - I tried buying eco-products, like the recycled tissue and toilet paper, but it's terrible, it's too thin and it is not as good quality as the normal product.

32 - If there is a cheaper alternative I will buy that, and to hell with the environmental consequences.

33 - Plastic is a wonderful material, its cheap, hygienic, and it does the job.

34 - Plastic is good because it conserves trees.

35 - Plastics might harm the environment, but they are good for cleanliness and hygiene, so everything is at a price.

36 - If an item looks attractive and is well presented in a shop I am more likely to be drawn towards it, you do tend to shop a lot with your eyes.
Disposal Q-sample:

Item number and statement

01- Twenty five years is a long time to be burning most of Cleveland’s household waste, it means we have got to produce that waste. I don’t think the four Borough’s should have to burn so much rubbish.

02- The main thing that bothers me is not the pollution from domestic waste, but that from factories. For example, there are worse smells from ICI, than from the Portrack incinerator.

03- I think the people that are dealing with waste policy are very irresponsible to allow incineration to happen.

04- Even if they make electricity from waste I still think recycling is a good idea, because with incineration, the resource is lost forever.

05- Landfills are the only way we can get rid of our waste.

06- I think the local authority should do more for recycling waste, they have got the responsibility, because the problem is in their back yard.

07- Recycling makes me feel better, like I am making my contribution in some small way. It makes me feel that I am actually participating in something worthwhile.

08- I can’t see how a new incinerator is going to affect me in any way what so ever.

09- We have more waste now because you used to burn waste on the fire and the smoke went into the atmosphere, it is better now we don’t have that.

10- We are never going to have problems finding waste to burn, because waste is as inevitable as death and taxes.

11- I am concerned about waste disposal, but I can’t get involved because decisions are made without me being told.

12- It’s our waste, so disposal should be run by the people for the people and should not be driven by profits.

13- A landfill is like a timebomb, the waste is just going to be there for hundreds of years, so future generations will not thank us for burying waste in the ground.

14- In my opinion we have got to get rid of waste somewhere and I’d rather see it burned than put in a landfill. With waste incineration we are dealing with the problem immediately, so you are going to make sure that the plant operates properly.

15- Sometimes you have to stop and say, look you’ve got to take the responsibility, you can’t always say oh well that’s fine, as long as its a million miles form me.

16- I wouldn’t mind if a landfill was opened near here.

17- The new incinerator will not encourage individuals and the local authorities to take full responsibility for recycling rubbish themselves.

18- I don’t live near Portrack so I don’t think about it.

19- Sometimes I feel guilty when I throw things in the bin that could be recycled.

20- I think that if things can be re-used for something else that is a good idea rather than just throwing things away, like using carrier bags as bin liners.

21- I recycle because it is a way of working against the system, something I can do to make a change.
22. As long as my house is tidy and my back yard is tidy then I don’t care about anything else.

23. I would have thought that if a private company is going to use waste to make electricity it should pay the council for the raw materials to produce electricity.

24. The new incineration is going to be better than landfill because we’ll get something back, in the form of electricity.

25. Producing electricity from waste is more important than worrying about producing dioxins, or acid rain materials.

26. If I knew that my waste was used to make a useful product like electricity I wouldn’t bother to recycle.

27. Making electricity from waste is basically the same as recycling.

28. I think landfills harm the environment.

29. We should go back to home-grown pigs, and compost heaps then we might not have this problem of throwing so much waste away.

30. More recycling would create more jobs, which would be good in this area.

31. I think incinerating is a cleaner project, hopefully a lot of the environmental nasties will be destroyed by heat.

32. What I throw out and broader environmental issues are not linked in any way.

33. I think Billingham has got more than its fair share of pollution.

34. I don’t like to see Portrack belching out filth.

35. Household waste is an important issue because every single house in the country has it.

36. I don’t think plastics are good, because they don’t degrade.

37. I should get a cut in my electricity bill if my waste is used to produce electricity.

38. Going to recycling centres definitely involves a car journey, especially in recycling the likes of bottles and newspapers.

39. Providing you don’t get any smells from the new incinerator I don’t suppose its going to cause any problems.

40. I don’t think a privately owned incinerator will be managed with the long term interests of society and the environment at heart, it is driven by profits. Where as if it was directly linked to the council there would be more accountability, it would be in the public eye more.

41. The new incinerator will be an unnecessary source of airborne pollution.

42. I think about recycling when I see things about the ozone layer and the pollution of the rainforest on the TV.

43. I think recycling is worth it because it is trying to save on resources and not waste things, we are a very wasteful society, so I definitely think it is worth the effort.

44. You should be able to take waste back to the point of sale, take it back to where you got it from, perhaps with the reward of getting a refund.

45. It’s too far to the recycling centre, so I just throw everything in the bin. I would recycle if there was somewhere handy, like at the end of the street.
46- I think that the left overs in the ash, and the emissions from incineration could cause problems.

47- Plastic incineration is very bad, it causes dioxin production, which is nasty, I think that should definitely be stopped.

48- I think recycling is a drop in the ocean and what I do isn’t going to make much difference to the environment because we are heading for disaster anyway.

49- Recycling would be easier if there were instructions on the packing telling me how to recycle the product.

50- As an individual I think I am doing all I can from an ecological or environmental point of view.

51- I am not conscious of what I throw away and don’t have a problem with waste, I just chuck everything in the bin.

52- I don’t get involved with environmental issues, because it is too much hassle and too much bother.

53- Plastic is easier for most people to get rid of than the likes of cardboard.

54- If everything is just driven by the economy, then nothing will ever happen to improve the environment.

55- In this area, I constantly feel as if I am contaminated by industries.

56- I buy something, use it, put it in the plastic bag, take it out on bin day, and as far as I am concerned that’s the end of it. The wagon picks it up and its gone.

57- Even if a system was set up where you put different waste in separate bags I would still find it hard to sort my rubbish and recycle waste in that way.

58- I think incinerators should be in more sparsely populated areas, somewhere such as Seal Sands

59- I don’t go to the recycling centre on purpose, because I would waste more natural resources going there specifically than the amount of good I would do by recycling.

60- Waste is an issue which no one can ignore, each and every one of us has a vested interest in any decision concerning how and where we dispose of our waste.

61- Years ago the pollution was worse than what it is now. We still talk about pollution, but it is not as bad as it was.
Appendix I

Presentation for the 'Green' P-subset

As you may be aware, Cleveland County Council has recently set up a joint venture company with a subsidiary of Northumbrian Water called Cleveland Waste Management. This company is now responsible for the disposal of your household waste. As part of its programme the company has decided to build a new waste incinerator to replace the old Portrack incinerator. The new incinerator is to be built at Billingham and like Portrack, it will continue to process the majority of Cleveland's household waste. Unlike the old incinerator at Portrack, the new incinerator is promised to be "greener" because it will use the heat produced from burning Cleveland's waste to produce electricity. Likewise, the new plant will have to conform with stringent pollution controls.

Waste incineration is a modern way of dealing with the large amounts of household waste which we produce in a year. Where recycling uses old materials as a raw ingredient for new products, incineration uses old materials to generate electricity. Unlike landfiling, waste incineration with energy generation harnesses the energy in wastes, such as paper and plastics, enough electricity will be produced for a town the size of Hartlepool. Old waste incinerators, like the one at Portrack, are often associated with pollution and toxic emissions. Modern plants, which incinerate waste at high temperatures and have complex gas filtering facilities, claim to have very low emissions which cause no harm to the public or the environment.

Waste incineration does not make waste go away, it is just a means of processing, and like any process, there are associated wastes. The main waste from incineration is ash which has to be disposed of in controlled landfills because it has concentrations of toxic materials in it. New incinerators still do emit low levels of toxic gases and particles. Although levels of pollutants such as dioxins, PCBs, and tiny dust particles called PM10s are low, there is still no evidence which proves that even small levels of these materials aren't harmful to our health.
Bearing in mind that Cleveland has very few facilities for landfilling waste, energy from waste is a very effective means of reducing the volume of waste which is produced in the county. Although energy from waste has a number of obvious benefits it also raises a number of other issues. A new incinerator is very expensive to build and for a private company to invest in a new plant it requires a guarantee that it will have sufficient waste to burn for the next 25 years. With the majority of Cleveland’s waste being incinerated, the argument has been made that other waste management practices such as waste avoidance and recycling could be stifled. There could be some future tension between local authorities who want to increase waste recycling, and the company managing the incinerator, which has ownership of the authorities waste.
Appendix J

Background Questionnaire

Please answer the following questions. Please write your answer after the question, or cross the appropriate box.

Name: ....................................................................................................................
Address: ................................................................................................................

1. Of the things that you throw out, which do you feel is the most wasteful?
...............................................................................................................................

2. What are your impressions of waste incineration with electricity generation as a way of disposing of Cleveland’s waste?
...............................................................................................................................

3. If any, which products do you buy where there is excessive waste?
...............................................................................................................................

4. In which shops do you do most of your shopping?
...............................................................................................................................

5. Where are these shops?
...............................................................................................................................

6. How do you get to the shops?
...............................................................................................................................

7. Approximately how much a week do you spend on food?
Under £10
£10 to £19
£20 to £29
£30 to £39
£40 to £49
Over £50
8. What do you understand by these symbols?
.........................................................................................................
.........................................................................................................
.........................................................................................................
9. What do you think of when you think of the environment?
.........................................................................................................
.........................................................................................................
10. In Cleveland, what types of waste are you most concerned with?
.........................................................................................................
.........................................................................................................
11. If any, what global environmental issues concern you?
.........................................................................................................
12. Which age group are you in?
under 20
20-29
30-39
40-49
50-59
60-69
over 70
No answer
13. Education.
From the age of 10 how many years of education have you had? .......... years.
14. Home ownership. Do you:
Own your home?
Rent your home privately?
Rent from the council?
15. Which political party do you prefer?
Conservative
Labour
Liberal Democrats
Other (please specify)
No answer
16. **Please tick one of the following:**
- I am a student
- I am retired
- I am on income support
  - Annually I earn less than £10,000
  - Annually I earn between £10,000 and £14,999
  - Annually I earn between £15,000 and £19,999
  - Annually I earn between £20,000 and £24,999
  - Annually I earn more than £25,000
- No answer

17. **How many children live with you?** (please write the number of children by the age group)
   - Under 5 years       ..... 
   - 5 to 9 years       ..... 
   - 10 to 14 years     ..... 
   - 15 to 20 years     ..... 
   - Over 20 years      ..... 
- None

18. **Are you:**
- Male
- Female

   **Thank you for your participation.**
## Appendix K

### Source Q-sample factor array

<table>
<thead>
<tr>
<th>Q Statement</th>
<th>Factor 1 “Contra-Consumers”</th>
<th>Factor 2 “Source reducers”</th>
<th>Factor 3 “Historical Commentators”</th>
<th>Factor 4 “Consumers”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Women spend most time in the kitchen, so they should be responsible for waste.</td>
<td>-3</td>
<td>-2</td>
<td>-3</td>
<td>2</td>
</tr>
<tr>
<td>2 - More working women means that there is more convenience foods and ready made meals.</td>
<td>0</td>
<td>4</td>
<td>-5</td>
<td>1</td>
</tr>
<tr>
<td>3 - There are so many ready meals in the supermarkets now that I don’t cook the same as I used to, I just get a ready meal and of course you’ve got all that packaging to throw out each time.</td>
<td>-4</td>
<td>0</td>
<td>-1</td>
<td>-5</td>
</tr>
<tr>
<td>4 - I remember my childhood, when you knew the shop keeper, the shop was part of the community.</td>
<td>-1</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>5 - All this packaging means that you have bags and bags for the bin men to take away and that in itself is an inconvenience</td>
<td>-1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6 - I am virtually forced to use supermarkets because they are so much cheaper than local shops.</td>
<td>0</td>
<td>-1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>7 - I think that all of the packaging on goods is necessary, it is not in excess.</td>
<td>-2</td>
<td>-4</td>
<td>-3</td>
<td>0</td>
</tr>
<tr>
<td>8 - As a consumer I would have an effect if I made my feelings felt to supermarkets and chain stores, by not buying products which I disapproved of.</td>
<td>0</td>
<td>-1</td>
<td>-2</td>
<td>1</td>
</tr>
<tr>
<td>9 - You have to have a car to use the supermarkets.</td>
<td>0</td>
<td>-2</td>
<td>-3</td>
<td>4</td>
</tr>
<tr>
<td>10 - I find that supermarkets are a pleasant shopping environment, there is more choice and they save a lot of time.</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>-2</td>
</tr>
<tr>
<td>11 - The people who are in a position to do something about excess waste, like Sainsburys and Asda, are not very interested in social welfare, therefore it would be difficult for them to downgrade there profits slightly in order to help society or the environment.</td>
<td>4</td>
<td>-1</td>
<td>-2</td>
<td>-2</td>
</tr>
<tr>
<td>12 - Every time I go to the supermarket, the things that I buy will, within days, need to be disposed of.</td>
<td>0</td>
<td>-1</td>
<td>3</td>
<td>-1</td>
</tr>
<tr>
<td>13 - When I do my shopping I make economic decisions and buy the cheapest on offer.</td>
<td>3</td>
<td>5</td>
<td>-4</td>
<td>-3</td>
</tr>
<tr>
<td>14 - There is more waste now because we have supermarkets, and we don’t have a grocer weighing things out at the corner shop.</td>
<td>1</td>
<td>-1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>15 - Packaging is a big con job, you are getting a big box, so you think you are getting value for money, when you open it up its only a little portion, its just a con job.</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>16 - Packaging is unnecessary from the consumers point of view, it is necessary from the producers point of view who want to sell their product, so they are happier packing their produce in a brightly coloured box so it makes the goods look attractive.</td>
<td>3</td>
<td>-3</td>
<td>5</td>
<td>-1</td>
</tr>
<tr>
<td>17 - The size of packages don’t affect the rubbish I put out.</td>
<td>1</td>
<td>-3</td>
<td>-1</td>
<td>-4</td>
</tr>
<tr>
<td>18 - I have moved away from what my mother and grandmother were like, which was to cook fresh vegetables every day, but then I don’t think I am the only one, we have taken advantage of convenience food because of the quickness.</td>
<td>-1</td>
<td>0</td>
<td>4</td>
<td>-3</td>
</tr>
<tr>
<td>19 - I think it is a bit of a contradiction when they put all these preservatives in food these days and yet they still have to have all this packaging to keep it fresh.</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>20 - All this fancy packaging does not affect the price of a product.</td>
<td>-1</td>
<td>-5</td>
<td>-2</td>
<td>-2</td>
</tr>
<tr>
<td>Q Statement</td>
<td>Factor 1 “Contra-Consumers”</td>
<td>Factor 2 “Source reducers”</td>
<td>Factor 3 “Historical Commentators”</td>
<td>Factor 4 “Consumers”</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------</td>
<td>----------------------------</td>
<td>------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>21 - I think the types of foods we have has changed packaging. For example, the margarine's you get today are very spreadable and have to be in a container.</td>
<td>-2</td>
<td>2</td>
<td>-1</td>
<td>-1</td>
</tr>
<tr>
<td>22 - I am sure that if the box didn't offer any protection it would still be there for advertising purposes.</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>23 - When I buy food I like it in a box, I like to see a picture of the thing I am buying on the box. I like to buy what looks the way it should, and without packaging I don't feel that I am getting a good product.</td>
<td>-1</td>
<td>-2</td>
<td>-2</td>
<td>-2</td>
</tr>
<tr>
<td>24 - The amount of packaging that comes with products is just horrifying really. I don't think there is any need for it, I would quite happily just have the basic thing, without all of that.</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>25 - I sometimes buy things, and I think that the packaging must have cost more than the product.</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>26 - I think people are encouraged to replace things, like they are encouraged to replace their car every 2 years, and to have the latest gadget, even if their current one was working quite efficiently.</td>
<td>5</td>
<td>0</td>
<td>-1</td>
<td>3</td>
</tr>
<tr>
<td>27 - It would be good if we weren't destroying trees just for the sake of packaging.</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>28 - I would say that over the last 10 years the amount of refuse has tripled because everything you use now is made to throw away.</td>
<td>2</td>
<td>-3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>29 - As a society we are more affluent now than we have ever been before which means we consume more, and I believe that the more we consume the more waste there will be.</td>
<td>1</td>
<td>-2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>30 - To me, progress is consuming more, and having more goods.</td>
<td>-5</td>
<td>1</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>31 - I tried buying eco-products, like the recycled tissue and toilet paper, but it's terrible, it's too thin and it is not as good quality as the normal product.</td>
<td>-3</td>
<td>0</td>
<td>-1</td>
<td>-1</td>
</tr>
<tr>
<td>32 - If there is a cheaper alternative I will buy that, and to hell with the environmental consequences.</td>
<td>-3</td>
<td>4</td>
<td>2</td>
<td>-3</td>
</tr>
<tr>
<td>33 - Plastic is a wonderful material, its cheap, hygienic, and it does the job.</td>
<td>2</td>
<td>1</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>34 - Plastic is good because it conserves trees.</td>
<td>-2</td>
<td>2</td>
<td>0</td>
<td>-4</td>
</tr>
<tr>
<td>35 - Plastics might harm the environment, but they are good for cleanliness and hygiene, so everything is at a price.</td>
<td>-4</td>
<td>-1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>36 - If an item looks attractive and is well presented in a shop I am more likely to be drawn towards it, you do tend to shop a lot with your eyes.</td>
<td>-2</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>
**Appendix L**

**Disposal Q-sample factor array**

<table>
<thead>
<tr>
<th>Q Statement</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>01- Twenty five years is a long time to be burning most of Cleveland’s household waste, it means we have got to produce that waste. I don’t think the four Borough’s should have to burn so much rubbish.</td>
<td>5</td>
<td>-3</td>
<td>-1</td>
</tr>
<tr>
<td>02- The main thing that bothers me is not the pollution from domestic waste, but that from factories. For example, there are worse smells from ICI, than from the Portrack incinerator.</td>
<td>-1</td>
<td>3</td>
<td>-2</td>
</tr>
<tr>
<td>03- I think the people that are dealing with waste policy are very irresponsible to allow incineration to happen.</td>
<td>2</td>
<td>-3</td>
<td>-5</td>
</tr>
<tr>
<td>04- Even if they make electricity from waste I still think recycling is a good idea, because with incineration, the resource is lost forever.</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>05- Landfills are the only way we can get rid of our waste.</td>
<td>-3</td>
<td>-1</td>
<td>-5</td>
</tr>
<tr>
<td>06- I think the local authority should do more for recycling waste, they have got the responsibility, because the problem is in their back yard.</td>
<td>1</td>
<td>2</td>
<td>-3</td>
</tr>
<tr>
<td>07- Recycling makes me feel better, like I am making my contribution in some small way. It makes me feel that I am actually participating in something worthwhile.</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>08- I can’t see how a new incinerator is going to affect me in any way what so ever.</td>
<td>-5</td>
<td>1</td>
<td>-1</td>
</tr>
<tr>
<td>09- We have more waste now because you used to bum waste on the fire and the smoke went into the atmosphere, it is better now we don’t have that.</td>
<td>-2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>10- We are never going to have problems finding waste to burn, because waste is as inevitable as death and taxes.</td>
<td>0</td>
<td>-1</td>
<td>3</td>
</tr>
<tr>
<td>11- I am concerned about waste disposal, but I can’t get involved because decisions are made without me being told.</td>
<td>-1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12- It’s our waste, so disposal should be run by the people for the people and should not be driven by profits.</td>
<td>2</td>
<td>2</td>
<td>-1</td>
</tr>
<tr>
<td>13- A landfill is like a timebomb, the waste is just going to be there for hundreds of years, so future generations will not thank us for burying waste in the ground.</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>14- In my opinion we have got to get rid of waste somewhere and I’d rather see it burned than put in a landfill. With waste incineration we are dealing with the problem immediately, so you are going to make sure that the plant operates properly.</td>
<td>-2</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15- Sometimes you have to stop and say, look you’ve got to take the responsibility, you can’t always say oh well that’s fine, as long as its a million miles from me.</td>
<td>2</td>
<td>2</td>
<td>-3</td>
</tr>
<tr>
<td>16- I wouldn’t mind if a landfill was opened near here.</td>
<td>-4</td>
<td>-1</td>
<td>-4</td>
</tr>
<tr>
<td>17- The new incinerator will not encourage individuals and the local authorities to take full responsibility for recycling rubbish themselves.</td>
<td>4</td>
<td>-4</td>
<td>-2</td>
</tr>
<tr>
<td>18- I don’t live near Portrack so I don’t think about it.</td>
<td>-3</td>
<td>-3</td>
<td>1</td>
</tr>
<tr>
<td>19- Sometimes I feel guilty when I throw things in the bin that could be recycled.</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>20- I think that if things can be re-used for something else that is a good idea rather than just throwing things away, like using carrier bags as bin liners.</td>
<td>0</td>
<td>5</td>
<td>-1</td>
</tr>
<tr>
<td>21- I recycle because it is a way of working against the system, something I can do to make a change.</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Q Statement</td>
<td>Factor 1 “Incoherent Environmentalists”</td>
<td>Factor 2 “Acquiescent Participants”</td>
<td>Factor 3 “Apathetic NIMBY”</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>----------------------------------------</td>
<td>-------------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>22- As long as my house is tidy and my back yard is tidy then I don’t care about anything else.</td>
<td>-2</td>
<td>-5</td>
<td>1</td>
</tr>
<tr>
<td>23- I would have thought that if a private company is going to use waste to make electricity it should pay the council for the raw materials to produce electricity.</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>24- The new incinerator is going to be better than landfill because we’ll get something back, in the form of electricity.</td>
<td>-1</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>25- Producing electricity from waste is more important than worrying about producing dioxins, or acid rain materials.</td>
<td>-5</td>
<td>1</td>
<td>-4</td>
</tr>
<tr>
<td>26- If I knew that my waste was used to make a useful product like electricity I wouldn’t bother to recycle.</td>
<td>-2</td>
<td>-1</td>
<td>-2</td>
</tr>
<tr>
<td>27- Making electricity from waste is basically the same as recycling.</td>
<td>-3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>28- I think landfills harm the environment.</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>29- We should go back to home-grown pigs, and compost heaps then we might not have this problem of throwing so much waste away.</td>
<td>0</td>
<td>-1</td>
<td>-3</td>
</tr>
<tr>
<td>30- More recycling would create more jobs, which would be good in this area.</td>
<td>1</td>
<td>2</td>
<td>-3</td>
</tr>
<tr>
<td>31- I think incinerating is a cleaner project, hopefully a lot of the environmental nasties will be destroyed by heat.</td>
<td>-3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>32- What I throw out and broader environmental issues are not linked in any way.</td>
<td>-4</td>
<td>-2</td>
<td>1</td>
</tr>
<tr>
<td>33- I think Billingham has got more than its fair share of pollution.</td>
<td>5</td>
<td>-5</td>
<td>4</td>
</tr>
<tr>
<td>34- I don’t like to see Portrack belching out filth.</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>35- Household waste is an important issue because every single house in the country has it.</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>36- I don’t think plastics are good, because they don’t degrade.</td>
<td>3</td>
<td>-2</td>
<td>2</td>
</tr>
<tr>
<td>37- I should get a cut in my electricity bill if my waste is used to produce electricity.</td>
<td>0</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>38- Going to recycling centres definitely involves a car journey, especially in recycling the likes of bottles and newspapers.</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>39- Providing you don’t get any smells from the new incinerator I don’t suppose its going to cause any problems.</td>
<td>-5</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>40- I don’t think a privately owned incinerator will be managed with the long term interests of society and the environment at heart, it is driven by profits. Where as if it was directly linked to the council there would be more accountability, it would be in the public eye more.</td>
<td>4</td>
<td>1</td>
<td>-1</td>
</tr>
<tr>
<td>41- The new incinerator will be an unnecessary source of airborne pollution.</td>
<td>4</td>
<td>-5</td>
<td>-1</td>
</tr>
<tr>
<td>42- I think about recycling when I see things about the ozone layer and the pollution of the rainforest on the TV.</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>43- I think recycling is worth it because it is trying to save on resources and not waste things, we are a very wasteful society, so I definitely think it is worth the effort.</td>
<td>3</td>
<td>5</td>
<td>-2</td>
</tr>
<tr>
<td>44- You should be able to take waste back to the point of sale, take it back to where you got it from, perhaps with the reward of getting a refund.</td>
<td>0</td>
<td>0</td>
<td>-2</td>
</tr>
<tr>
<td>45- It’s too far to the recycling centre, so I just throw everything in the bin. I would recycle if there was somewhere handy, like at the end of the street.</td>
<td>0</td>
<td>-3</td>
<td>5</td>
</tr>
<tr>
<td>46- I think that the left overs in the ash, and the emissions from incineration could cause problems.</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>47- Plastic incineration is very bad, it causes dioxin production, which is nasty, I think that should definitely be stopped.</td>
<td>2</td>
<td>-1</td>
<td>2</td>
</tr>
<tr>
<td>48- I think recycling is a drop in the ocean and what I do isn’t going to make much difference to the environment because we are heading for disaster anyway.</td>
<td>-1</td>
<td>-4</td>
<td>-2</td>
</tr>
</tbody>
</table>
Q Statement | Factor 1 "Incoherent Environmentalists" | Factor 2 "Acquiescent Participants" | Factor 3 "Apathetic NIMBY"
---|---|---|---
49- Recycling would be easier if there were instructions on the packing telling me how to recycle the product. | 0 | 1 | -3
50- As an individual I think I am doing all I can from an ecological or environmental point of view. | -2 | -2 | -4
51- I am not conscious of what I throw away and don't have a problem with waste, I just chuck everything in the bin. | -4 | -2 | 4
52- I don't get involved with environmental issues, because it is too much hassle and too much bother. | -1 | -4 | 4
53- Plastic is easier for most people to get rid of than the likes of cardboard. | -1 | -3 | -3
54- If everything is just driven by the economy, then nothing will ever happen to improve the environment. | 2 | 2 | -5
55- In this area, I constantly feel as if I am contaminated by industries. | 5 | -1 | 0
56- I buy something, use it, put it in the plastic bag, take it out on bin day, and as far as I am concerned that's the end of it. The wagon picks it up and its gone. | -4 | 0 | 3
57- Even if a system was set up where you put different waste in separate bags I would still find it hard to sort my rubbish and recycle waste in that way. | -1 | -4 | 2
58- I think incinerators should be in more sparsely populated areas, somewhere such as Seal Sands | -3 | 2 | 4
59- I don't go to the recycling centre on purpose, because I would waste more natural resources going there specifically than the amount of good I would do by recycling. | -1 | -2 | -1
60- Waste is an issue which no one can ignore, each and every one of us has a vested interest in any decision concerning how and where we dispose of our waste. | 4 | 1 | -1
61- Years ago the pollution was worse than what it is now. We still talk about pollution, but it is not as bad as it was. | -2 | 0 | 1
Appendix M

Defining respondents responses to Question 8 of the questionnaire

**GREEN DOT**: 

<table>
<thead>
<tr>
<th>Incoherent Environmentalists</th>
<th>%</th>
<th>Acquiescent Participants</th>
<th>%</th>
<th>Apathetic NIMBYs</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gave no answer</td>
<td>13</td>
<td>59</td>
<td>18</td>
<td>78</td>
<td>6</td>
</tr>
<tr>
<td>recyclable</td>
<td>2</td>
<td>9</td>
<td>2</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>recycled</td>
<td>3</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>re-useable</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>recycle</td>
<td></td>
<td></td>
<td>1</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>recycling</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>environmentally friendly</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>biodegradable</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ozone friendly</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Green Dot</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>underpass</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>detour</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
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</tbody>
</table>

**RECYCLING SYMBOL**: 

<table>
<thead>
<tr>
<th>Incoherent Environmentalists</th>
<th>%</th>
<th>Acquiescent Participants</th>
<th>%</th>
<th>Apathetic NIMBYs</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gave no answer</td>
<td>12</td>
<td>55</td>
<td>12</td>
<td>52</td>
<td>3</td>
</tr>
<tr>
<td>made of recycled material</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>recycling</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>recyclable</td>
<td>4</td>
<td>18</td>
<td>3</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>recycle</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>recycled</td>
<td>2</td>
<td>9</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>“green” product</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>recyclable plastic</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>roundabout</td>
<td></td>
<td></td>
<td>2</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>wool</td>
<td></td>
<td></td>
<td>1</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>aluminium cans</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Radioactivity</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

77 The Green Dot is a symbol which is used for financing and demonstrating participation in recovery activities, and it does not mean a package has been or can be recycled (Ringel, 1998).
## KEEP BRITAIN TIDY:

<table>
<thead>
<tr>
<th>Incoherent Environmentalists</th>
<th>%</th>
<th>Acquiescent Participants</th>
<th>%</th>
<th>Apathetic NIMBYs</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gave no answer</td>
<td>2</td>
<td>9</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Keep Britain Tidy</td>
<td>2</td>
<td>9</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Please put rubbish in bins</td>
<td>3</td>
<td>14</td>
<td>4</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Dispose of litter properly</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Throw your litter in a bin</td>
<td>4</td>
<td>18</td>
<td>2</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Litter bin</td>
<td>4</td>
<td>18</td>
<td>5</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>Keep tidy</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>Dispose of rubbish carefully</td>
<td>3</td>
<td>14</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Waste disposal</td>
<td>2</td>
<td>9</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>litter</td>
<td></td>
<td></td>
<td>2</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Collecting rubbish</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Pick up waste</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

## RECYCLING BIN:

<table>
<thead>
<tr>
<th>Incoherent Environmentalists</th>
<th>%</th>
<th>Acquiescent Participants</th>
<th>%</th>
<th>Apathetic NIMBYs</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gave no answer</td>
<td>7</td>
<td>32</td>
<td>14</td>
<td>61</td>
<td>5</td>
</tr>
<tr>
<td>Recycling</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Collecting rubbish</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Recyclable material only</td>
<td>2</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can, paper, or bottle bank</td>
<td>9</td>
<td>41</td>
<td>3</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>Litter</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Senior citizens crossing</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Litter bin</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shopping area</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Recycle Britain’s Waste</td>
<td>2</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Car wash</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
Appendix N

Recycling versus energy from waste

For a long time British environmental groups, headed by Friends of the Earth, have led an anti-incineration campaign which was launched to challenge old incinerators such as the Portrack plant, but has continued to criticise EfW facilities. Since it became apparent that the government supported EfW and began to put in place legislation to support EfW, this debate has been added to by industrialists and academics, some of which have vested interests in recycling. While this debate began by primarily criticising incineration on the grounds of hazardous emissions, it has been transformed into a debate between EfW and recycling, whereby recycling is argued as being environmentally superior to EfW. Proponents of the recycling versus EfW debate fall into two main groups: those who feel EfW is a bad management method and a threat to recycling (environmental NGOs, the paper industry, and some local authorities), and those who argue that EfW makes sound environmental sense (EfW operators, engineers, many in the plastics industry, and some local authorities).

The pro-recycling lobby argue that EfW is only acceptable once the maximum amount of recycling has taken place, for example once paper fibres become too short to recycle. This group argue that modern EfW facilities do not permit this to happen and therefore EfW competes with recycling and is a threat to the development of recycling. Equally, those who preference recycling above EfW argue that it makes environmental sense to recycle because in addition to raw materials, resources such as energy, water, and land are also preserved (Curry, 1997, Friends of the Earth, 1997a & b).

The position taken by those promoting EfW is very different, with advocates arguing that energy from waste is economically sustainable and generates energy from a renewable fuel; “As a renewable energy source, energy from waste helps to conserve fossil fuels and increases the diversity of our energy supply (Department of Trade and Industry, 1995a). The argument is also made that modern EfW offers a local waste recovery solution for all wastes, not just those with a high scrap value. As a consequence, it is a sustainable solution to waste management which also reduces the environmental impact of transport (Porteous, 1997).

While the pro-recycling side of this debate is slowly acknowledging that EfW and recycling can co-exist (Childs, 1998), it has been the advocates of EfW who first acknowledged the benefits which can be achieved from integrating recycling and EfW. To illustrate this point, a study was undertaken by the National Society for Clean Air Waste Management (1993) which illustrates that a 47% recycling rate of putrescibles, paper and glass can increase the calorific value of waste by a third. In addition, an EfW plant such as Cleveland’s can efficiently extract as much as 12,000 tpa of steel from household waste (Porteous, 1997).
Although both sides of the EfW or recycle debate are now looking at an integrated approach to waste management, they continue to defend their favoured recovery techniques vigorously. In their respective defences it is interesting to note that both sides of this debate have utilised LCA studies to demonstrate the superiority of their preferred recovery technologies (BNMA, 1995; Porteous, 1990 & 1997; Leach et al., 1997; O’Brien et al.; and Coopers & Lybrand and EC DGXI, 1996). It is outside of the remit of this thesis to discuss these studies in detail, but the observation is made that all studies provide convincing results, but the boundary definitions, data quality and case studies from which these results are derived are all different (Porteous, 1997). These parameters of LCA studies can significantly influence the results generated from such studies to the extent that the recycle or EfW question can never be properly answered on the basis of LCA alone (Leach et al., 1997; MacGuire & Childs, 1998; Leach, 1998).

As a speaker at a recent conference on paper recycling put it “who’s life, who’s cycle, who’s analysis” (Gale, 1998), in other words, it all depends on the assumptions used.

Despite the scientific approach taken by both sides in this debate, it is disappointing that for so long the debate has revolved around an either recycling, or EfW (and vice versa), approach to waste management. When viewed critically, recycling and EfW, as illustrated by the LCA studies which try to justify these activities, both contribute to and help to ameliorate environmental pollution. It is often the case that there is never a clear winner with this debate, and best practice management decisions (based on LCA), will vary from one location to another and also upon the relative loadings placed on variable factors (Leach et al., 1997 and Porteous, 1997). Equally disappointing is the fact that most of this research has revolved around the paper industry who are particularly concerned about the effect EfW will have on their cheap domestic fibre source (64% of the fibre Britain uses in domestic paper and board manufacture is sourced from waste material (Gale, 1998)). Despite this level of success it is untenable to compare a successful recycling rate in one material with EfW, which provides a recovery option for all combustible materials and usually steel.

While it is difficult to come to sensible waste management decisions on the basis of the ‘EfW or recycle’ debate, it does serve a purpose in highlighting a fundamental environmental impact which results from the large scale of many recycling and EfW facilities. Many recycling operations, such as paper and steel mills need to be large scale and as a result the transport costs in delivering waste from the home to these reprocessing facilities is high. While it is relatively easy to compare the transport costs required to deliver, for example, scrap paper from a paper collector to the mill, it is almost impossible to determine how the paper was delivered to the merchant, particularly when ‘bring’ systems are employed (Porteous, 1997 also highlights this problem). In contrast, EfW plants are usually situated locally and refuse is collected by the local authority or a sub-contractor. As a result mileage is lower and it is easier to manage the impact of this transport which is controlled by the waste collector and therefore impacts are easier to measure. Having said this, higher transport costs could result when large EfW facilities are built and insufficient waste is available locally to satisfy the facility. This situation has arisen in Cleveland because waste is imported from Gateshead, which 40 miles away.
It is clear that there are advantages to, and problems with, both EfW and recycling, and it is not simply a case of choosing either recycling or EfW for managing waste. In light of this, it is usually more appropriate to look for an integrated solution to waste management.