The Landfill Campaign Guide

Introduction

This introduction -

- *explains why Friends of the Earth has produced this guide*
- *describes how the guide can best be used*
- *explains why there are separate references to Northern Ireland.*

Why a landfill campaign guide?

Landfill sites present serious environmental threats. Friends of the Earth opposes landfill sites for the following reasons:

- Landfill sites support the waste of valuable resources. Research by Friends of the Earth, which is due to be published in late 1997, will suggest that we need to reduce resource consumption by 80-90 per cent. We cannot continue to throw valuable resources into holes in the ground. Landfill sites, through their very existence, encourage our "throw-away society".

- Landfill sites can cause serious pollution of rivers, streams and groundwaters.

- Landfill sites generate gas, especially methane, as waste decomposes. Methane is an important greenhouse gas contributing to climate change. We must reduce the amount of greenhouse gases that are emitted into the atmosphere. Methane is also a dangerous explosive gas.

- It is generally accepted that we should reduce the amount of waste we generate. For waste that is produced, we should reuse it before recycling it. The worst options for waste are burning it in incinerators or throwing it in a hole in the ground. The options for waste have been ordered into a hierarchy - landfill is the least desirable option (*see box, Section 4*).

- Landfill sites also contribute to the destruction of habitats and create a nuisance to local communities through the generation of traffic, noise, pests, litter and smells.

Friends of the Earth (FOE) believes that every person has the right to have their say about having a landfill site in their neighbourhood. This guide aims to help people realise that right. This guide is for Friends of the Earth groups and any other community groups who want to oppose a landfill site which is being imposed on their community, and there is also a section about landfill sites that already exist. This guide pulls together the experience of our campaigners at all levels to provide support for those campaigns.

Your campaign - local pressure on local politicians

The most important thing a campaigner can do is to show local politicians that there is local opposition to a proposal, so your main job should be to motivate people into some action - writing a letter, joining in a march, phoning up a councillor. Nobody wants a landfill in their neighbourhood unless they might directly benefit from a job there - and that will be true for very, very few people. So you just need to tap into people's natural opposition to a landfill proposal and show them the opportunities to make a difference. Although we have put lots of technical detail into this guide, we have done this to help you understand the process and be able to cope with technicalities when they arise. Do not be put off by the detail in this guide! Remember that if councillors feel enough pressure, they will start looking for ways out themselves and will be able to garner the technical resources of the council officers too.

It is not necessary to grasp every detail before beginning. If you still have doubts, before you do anything else, read the experiences of two local FOE groups *(Section 14)* - and you will be inspired!

The process in a nutshell

Every proposal for a landfill must go through various procedures in order to gain the necessary permissions from the various regulatory authorities. The objective of a campaign is to prevent one or more of those permissions from being granted, thereby stopping the proposal. This will involve both encouraging large

numbers of people to join in and support your campaign, and participating in the formal decision making processes:

- firstly, granting the planning permission
- secondly, granting a waste management licence (WML).

Both of these stages, but especially the planning permission process, allow the public to have some input into the decision-making. This guide explains the procedures by which these permissions are obtained, and how they can be opposed by your campaign.

Landfill spotting!

Not all landfills are described as landfills in their planning applications. Terms such as "gravel extraction and restoration", "restoration of existing landfill" or "landraising" may be used. So keep your eyes peeled and speak to the planning authority *(see Section 10)* if in any doubt.

How to use this campaign guide

This guide is designed to allow you to develop confidence with landfill issues and to enable you to anticipate and prepare for the opportunities which are presented as your campaign develops.

The guide is broken down into sections and annexes. You will not need to read the whole of it at once, some sections are more relevant at different stages of the campaign *(see Section 2)*. Although overall any campaign is likely to take some time, **some stages happen very quickly**. For example you only have 21 days at most to comment on a planning application, so immediately find out what stage things are at.

Section 1 - Campaigning

This section -
- highlights the importance of involving large numbers of people in your campaign
- suggests how you may want to plan your campaign
- provides advice on the essential elements of most campaigns.

Read this section before you start campaigning.

Section 2 - The Stages in a Landfill Campaign

This section -
- details the steps that a proposal for a landfill site needs to go through
- points to the relevant sections in this guide where you can find more help.

This section is essential reading to help you establish at what stage in the system is any particular landfill proposal. You may have to act quickly depending on the current stage. It is also a useful reference for checking progress during the campaign.

Section 3 - Northern Ireland - Planning and Waste Disposal Licensing

This section -
- provides details on waste management planning and licensing in Northern Ireland
- identifies opportunities to campaign against the granting of licences.

This section is essential reading for campaigners in Northern Ireland.

Section 4 - Landfill Policies

This section -
- provides an overview of the UK Government's policies regarding landfill sites
- provides an overview of European policy regarding waste and landfill
- gives an overview of Friends of the Earth's views on landfill.

This section should provide useful background information for your campaign. You may not want to read this immediately, but refer back to it later when your campaign is underway and you have found out the basic information.

Section 5 - How Landfills Work

This section -
- provides an overview of how landfills are constructed and operated.

This section provides useful background reading when you are beginning to get into debates about specific details of a landfill.

Section 6 - Introduction to the Environmental Problems Associated with Landfill Sites

This section -

- provides an overview of the environmental problems associated with landfill sites and the risks they pose to wildlife, people and property.

Section 7 - Establishing the Facts about a Proposal

This section -

- identifies the information you will need for your campaign
- offers tips on how to get the relevant information.

A good campaign needs to carry out some research. This section is essential reading before the campaign is launched.

Section 8 - Who Gives Planning Permission for Landfill Sites?

This section -

- describes when landfill sites need planning permission
- details who gives the permission
- discusses the official guidance given to the decision- makers
- looks at the rights of appeal if a planning application is granted or refused.

This section is essential reading so that the group understands "the rules of the game" whilst it is campaigning to stop the council giving planning permission for the landfill site.

Section 9 - Objecting to the Planning Application

This section -

- guides your group through compiling its formal objection to the planning permission
- suggests useful potential allies who may be able to provide you with evidence in your objection
- details the grounds on which you can object to the application (the rules of the game)
- suggests information you will need to include in your objection.

This section is essential reading when your group compiles its objection to the planning application.

Section 10 - The Local Planning Authority and How to Lobby Them

This section-

- explains how local authorities work
- provides tips on influencing their decisions.

This section is useful background reading when you are campaigning against the planning permission.

Section 11 - Who Gives Landfill Sites Licences to Operate?

This section -

- describes the licences needed to operate a landfill
- looks at the procedure for applying for a licence
- details the opportunities to object to the licence application
- discusses compliance with licence conditions if granted.

This section is essential reading for the group so that it can understand "the rules of the game" when campaigning against the granting of a licence to operate a landfill.

Section 12 - Campaigning Against the Licence Application

This section -

- details the grounds for opposing an application for a waste management licence.

This section is essential reading for when your group compiles its objection to the granting of a licence for the landfill to operate.

Section 13 - The Environmental Statement

This section -

- details when an Environmental Statement is needed
- describes what an Environmental Statement is
- suggests how to examine an Environmental Statement.

This section is essential reading when your group is examining an Environmental Statement provided to the Local Planning Authority (LPA) or Environment Agency by the developer/operator of the proposed landfill site.

Section 14 - Conclusions and Case Histories

This section -

- gives concluding remarks
- highlights two examples of successful landfill campaigns.

This section is useful reading before starting to

campaign or when it is feeling like an uphill battle.

Annexes

1. The arguments
2. Landfill gas
3. The scale of the landfill gas problem
4. Water pollution by landfill sites
5. About groundwater
6. Landfill liners
7. Campaigning against existing landfill sites
8. Reading List

Glossary

Appendices

1. FOE Briefing Sheet: *Don't Burn it or Bury it - alternatives to landfill and incineration.*
2. FOE Briefing Sheet: *Up in Smoke...why Friends of the Earth opposes incineration.*

Northern Ireland

This guide is written predominantly from the perspective of England and Wales. Both the administrative structures responsible for waste management and legislation differ drastically in Northern Ireland. We have included a separate chapter to help, and some further guides are mentioned in the Reading List *(Annex 8)*. Remember that there will be many similarites whether you are campaigning in England or Northern Ireland, but that you might need to check on the particulars of legislation and process.

As stated in the text, the existing legislation governing waste management in Northern Ireland is about to be replaced with new legislation which will bring it broadly in line with the rest of the UK. However, although Northern Ireland should achieve legislative parity with the rest of the UK in 1997, a number of factors will help to create confusion over the next 1-2 years.

The introduction of the new legislation must be followed up by regulations issued by the Department of the Environment, which may result in further delays before the legislation is actually in force "on the ground".

Additionally the Department of the Environment has just awarded a contract to consultants to write a Strategy for Sustainable Waste Management for Northern Ireland. Until this strategy is published (probably not before early 1998) there is likely to be a great deal of confusion on the part of local authorities over what government policies apply in Northern Ireland.

FOE's Northern Ireland Campaigner is writing a briefing sheet on Waste Management in Northern Ireland for local groups as a supplement to this guide which should be available soon after publication of this manual. Telephone 01232 664311 for details.

Scotland

Although much of this guide has general relevance for anyone concerned about a landfill site, this guide does not specifically cover Scotland, which has separate legal and administrative organisations. Friends of the Earth Scotland can be contacted in Edinburgh, telephone 0131 554 9977.

Feedback Please

Do give us your thoughts on what was the most useful part of the guide. What was the least useful? What was covered in too much detail or what was covered in too little? What were the most grievous omissions? Has it helped you win a campaign? All constructive criticism will be gratefully received and your experiences might be useful to share with other campaigners in a later edition of the guide.

The information in this guide is up to date at the time of going to print but, like all publications, it will become out of date and will need to be regularly updated. In particular, the technical supplements will be updated with information from other sources; you will be able to get updates from FOE from time to time. It would be helpful if you would fill in and return to us the form inserted into this guide.

Section 1

Campaigning

This section -

- *highlights the importance of involving large numbers of people in your campaign*
- *suggests how you may want to plan your campaign*
- *provides advice on the essential elements of most campaigns.*

Read this section before you start campaigning.

Before you read the rest of this guide, remember **you can win**. Most people who lose their battles against landfill sites do so because they haven't managed to motivate large numbers of local people to object to the proposals and/or have lacked the insight and information they need to translate their justifiable concerns into an effective campaign. We hope that this guide can help you motivate people and give you the information you need to win your campaign.

However, even if your campaign does not stop the proposal completely, it will not have been a total failure. Your campaign will almost certainly have made sure that the landfill is forced to have more stringent safety controls and operating conditions (on noise, working hours, etc).

Bear in mind that your campaign is part of a wider campaign for a sensible waste management policy. It is important not to do anything that will make your own campaigning or that of other groups more difficult, for example, by suggesting that the landfill site should be built somewhere else.

The success of your campaign is likely to depend on two factors:

- a high level of support within the local community
- solid and well-presented arguments on planning and licensing issues

Planning your campaign

A good campaign is a campaign that is well planned and involves a large number of people. A good campaign plan will identify the following:

The campaign objective - be clear about what you want to achieve, almost certainly to prevent the landfill from being developed and to persuade the council and others that the waste could be managed in some other way, e.g. waste minimisation and recycling (*see Appendix 1).*

The targets - those people whose mind you need to change. In the case of a landfill campaign, that is going to be a) your council (the local planning authority) over the planning application to build the landfill site and b) the Environment Agency who will provide the landfill operator with a licence to operate. This guide goes into detail on how to influence these people and when is the best time to do so.

The key players - these are the people who could help or hinder your campaign. For a landfill site your allies are likely to include local residents, parish councils, the media, other local community groups and perhaps your local MP. Your opponents will include those people who are planning to build and operate the landfill site.

The research you need to do - this includes who is proposing the site, who will make the decisions and what guidelines they will use to do so, and what are the alternatives. Some of this information is in this guide but some of it you will need to find locally.

The tactics and opportunities - winning the campaign will involve using the right tactics at the right time. For example you will want to build up local support early on and this may involve leafleting and holding public meetings. At other times you will need to prepare your objection to the landfill site to submit to the council or the Environment Agency (which this guide will help you do). A good campaign recognises that it can't do everything at once and plans to put its efforts into the right actions at the right time.

The resources you need - every campaign needs money and people. Your campaign plan should identify opportunities to raise money - through street collections, jumble sales, etc - and opportunities to involve people, for example, to deliver leaflets, lobby councillors, etc.

A timeline - a calendar of events and what needs doing when. This both helps ensure that things get done and also ensures that the whole group knows what is happening and coming up.

Spending time as a group writing the campaign plan and dreaming up stunts is always time well worth spent.

Publicising your campaign

Here are a few examples of how you could publicise your campaigns

Leafleting is an important way of communicating your concerns to a large number of people and raising public awareness of the campaign. You could post leaflets through doors at houses in key locations, for example near the proposed landfill site or in the area that the key councillors live - those councillors who have the responsibility to give or refuse planning permission.

The leaflet should say what the environmental problems of landfills are and what you think about the proposal. The leaflet should also tell people how they can help, for example by writing to the councillors for their area. It is also important to encourage as many people as possible to send letters to the council saying they object to the proposal. Let them know that councillors get few letters and phone calls and that therefore their effort will make the councillors sit up and take notice.

Hold a public meeting and invite the key councillors to attend or speak. You will want to ensure a good turn-out to this meeting to ensure that they are aware of the strength of feeling. Use an accessible and well known venue, perhaps a local community centre. Put up posters and distribute leaflets advertising the meeting a few weeks in advance. Advertise in the local paper (or at least ask for a mention in the events section). Write to all the councillors inviting them to attend (and offer the leaders of the political parties the opportunity to speak) and also invite the key council officers. Don't forget to invite the media. At the public meeting you will want to have a member of your group saying why it opposes the landfill site and offer the opportunity for other groups to do the same also.

Organise a petition or public opinion survey. This is aimed at convincing the councillors of the level of support for your campaign, and relatively simple to organise. It can simply ask " *have you heard that there is a proposal to build a big rubbish tip at X ?*", "*do you want the rubbish tip at X or not ?*", "*do you think we should be recycling our waste instead ?*" It is worth carrying out the survey outside shopping areas and other places where plenty of people go. Once you've asked a few hundred people you can then let local councillors know the results and also tell the media *(see below)*.

Organise a letter-writing campaign. Councillors and Environment Agency officials will be more impressed with the greater personal effort that is required for people to express their views in a letter than simply by signing a petition. You can encourage people to write letters through your leafleting, posters, presswork and public meetings.

Use the media. Getting articles in your local press and on the radio enables you to get your message to many thousands of people. You can generate stories for the media in a range of ways, for example:

- launch the campaign
- hold a public meeting
- welcome or condemn new proposals
- lobby a council meeting
- do a public opinion survey
- have a stunt - perhaps dumping waste at the proponent's doorstep

Key campaign materials

Most campaign groups have found the following materials useful:

- a leaflet outlining the threat, what you're doing about it and what action you want others to take
- a newsletter/news sheet to keep supporters up to date with what is happening
- a list of key people in the campaign and their contact numbers
- a briefing sheet - this should provide further information to journalists and new people joining your campaign; if it looks professional so much the better, but the facts are all important
- posters with a simple message - for example "no toxic fumes wanted". These can be put up in shop windows, homes or used on placards
- postcards and pre-printed letters.

Bear in mind who will read the information. If it is targeted at the general public, keep it simple. If it is aimed at council officials, you could use more technical language and arguments.

A few general campaigning tips

Remember the range of arguments. Whilst it's important to focus in on particular weak points of the proposal, it's usually best not to concentrate on too narrow a range of issues - e.g. just traffic - since the points of interest may change. Make clear at all opportunities that there are a range of reasons why the proposal should be rejected and do not allow your campaign to be wrong-footed by tactical concessions from the developers.

Ask questions. No-one can be expected to become an expert in planning and pollution law and procedures overnight. Ensure that you talk to relevant officials (such as council, Environment Agency or even Department of the Environment staff) to be absolutely sure that you understand latest policy or where a process is up to. There will be many points of procedure - including crucial deadlines or meetings, the desirable format and number of copies of any objections - of which you should be aware.

Remember your campaign may take a long-time. Whilst you should find your campaigning rewarding and satisfying - whatever the outcome - campaigning against a landfill site proposal can take a long time. Even with a group, the campaign may sometimes seem a rather lonely and thankless business. Many developers expect a storm when they announce their proposals, but count on the fuss dying down after a while. So prepare yourself for the long haul and stick at it.

Get as many people involved as possible. Try and involve as many people in the campaign as possible. Not only does this allow the work and cost to be spread more evenly but it gives the campaign greater credibility if you can claim to be speaking on behalf of the local population.

Spread the workload. Spread the workload as evenly as possible amongst the group, making sure that you identify and use the skills and resources that people in the group can contribute. These may range from the highly specific (eg legal experience, relevant scientific experience, media experience, previous campaigning experience) to more general (time to write the letters, time to visit the Town Hall or Library during the day, time to be available for media calls during the day).

Run effective meetings. Ensure that the campaign group meets regularly and that you have an agenda to try to make sure that everything that needs to get sorted out does get sorted out - this also gives a good impression of the group. Also try to make sure that there is a written record with key points raised during the meeting, and any decisions and action points that might have been agreed. This is useful to help you keep track of who is doing what.

Build up a media list. It is important, if possible, to make personal contact with the local media (papers, TV and radio) and keep the journalists up to date with the progress of the campaign. Again, make sure that you have a list of the names, positions, telephone numbers, fax numbers and addresses of all relevant media contacts.

Get it in writing! Make sure you have a written record of all exchanges with the developers and even the council. Avoid being drawn into a succession of cosy informal chats or off the record briefings. This will allow you to reference key points in any subsequent campaigning literature you produce. It is also useful to be able to produce these solid facts when dealing with the media.

Section 2

The Stages in a Landfill Campaign

This section -

- *details the steps that a proposal for a landfill site needs to go through*
- *points to the relevant sections in this guide where you can find more help.*

This section is essential reading to help you establish at what stage in the system is any particular landfill proposal. You may have to act quickly depending on the current stage. It is also a useful reference for checking progress during the campaign.

Every proposal for a landfill must go through various procedures in order to gain the necessary permissions from the regulatory organisations. Your objective is to prevent one or more of those permissions from being granted. It is therefore important to maintain a constant awareness as to the progress of the proposal in obtaining these permissions and to take the necessary action at the right times. As we pointed out in Section 1, the most significant stages from a campaigning point of view are the applications for planning permission and the waste management licence (WML). This chapter therefore guides you through the processes by which planning permission and the WML are obtained and indicates what action you could take at each stage.

The following flow diagram could be used throughout your campaign to help you keep track of events and to focus your campaigning activities. The diagram provides reference to other sections and annexes which explain what is involved and how to carry out each activity.

Important: Before you do anything about your campaign and your campaign plan, aim first to work out exactly what stage the proposal is at on the flow diagram. Speak to the local council and Environment Agency to check your understanding of the stage of the landfill proposal.

Section 3

Northern Ireland - Planning and Waste Disposal Licensing

This section -

- *provides details on waste management planing and licensing in Northern Ireland*
- *identifies opportunities to campaign on the granting of them.*

This section is essential reading for campaigners in Northern Ireland.

In Northern Ireland, planning is the responsibility of the Department of the Environment Town and Country Planning Service. The opportunities for lobbying councillors and planning committees on the issue of granting planning permission therefore do not exist in Northern Ireland because local authorities in Northern Ireland do not have responsibility for planning.

Northern Ireland has 26 local authorities ranging in population size from Belfast with a population of 296,700 down to Moyle with 15,100. At the present time, each local authority is individually responsible for waste collection and disposal, regulation and waste policy planning within its own area. This structure of 26 local authorities was originally created to operate in conjunction with an elected regional tier of government similar to the County Council system in Britain, but the dissolution of the Northern Ireland parliament at Stormont in 1972 meant the proposed regional bodies never materialised. This has resulted in local authorities in Northern Ireland having a limited range of responsibilities such as waste management, cemeteries, recreational facilities and economic development. The functions which were originally intended to be carried out by the regional tier of local government have been split between the DOE(NI) (planning, roads, water, sewerage, conservation) and appointed boards or quangos (housing, education, social services, health).

There are six divisional planning offices at Belfast, Ballymena, Londonderry, Downpatrick, Portadown and Omagh with a further two sub-offices at Coleraine and Enniskillen. The operation of this system has been described as follows:-

"*The essential components of this system which combine to distinguish it from others, are that planning is administered by central Government on a regional basis, as opposed to being a local government function, and appeals are made to an independent body, the Planning Appeals Commission.*"[1]

Landfill sites and the planning system in Northern Ireland

Although the administrative system is different in Northern Ireland, planning law is similar to that in Great Britain. Planning permission is required for development as defined in Article 11 of the Planning (Northern Ireland) Order 1991 (which corresponds to the definitions in Section 55 of the Town & Country Planning Act 1990). Planning permission would normally be required for the construction of a landfill site unless an exemption applies under the Planning (Use Classes) Order (Northern Ireland) 1987 or the Planning (General Development) Order (Northern Ireland) 1993. An Environmental Assessment (EA) will be required for any landfill site which is likely to have a significant environmental impact under regulation 2 and paragraph 11(c) of Schedule 2, the Planning (Assessment of Environmental Effects) Regulations (Northern Ireland) 1989. In practice, this should mean that all proposals for landfill sites will require an EA to be carried out.

In Northern Ireland, all planning applications are advertised and planning appeals are determined by the independent Planning Appeals Commission. Requests for advice or applications for planning permission in Northern Ireland should be addressed to the appropriate Divisional Planning Office.

Waste management legislation in Northern Ireland

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[1] Dowling, J.A. (1995). *Northern Ireland Planning Law.* Gill & Macmillan.

With respect to the licensing of waste handling operations, the legal situation in Northern Ireland differs from that in Britain. Environmental legislation which has been introduced in Great Britain is often delayed by a number years before its introduction into Northern Ireland. At the present time (May 1997), the relevant legislation in Northern Ireland is the Pollution Control and Local Government (NI) Order 1978. The equivalent legislation to Part II of the Environmental Protection Act 1990 (Waste on Land) has yet to be introduced in Northern Ireland. Draft proposals were released by the DOE(NI) in January 1996 which should result in an Order being introduced at the end of 1997 *(see below)*.

A Future Strategy for Waste Management in Northern Ireland

In 1993 the Government published its proposals for waste management in Northern Ireland. It stated as its strategy objectives:

- the improvement of standards of practice, which the Government will achieve by introducing new controls to provide legislative parity with the rest of the UK, and the flexibility to respond to emerging European Directives,
- the revision of administrative arrangements, by creating a separate, centralized regulatory body; and
- the opportunity for market forces to determine the best practicable environmental option (BPEO), using the new centralized waste regulatory body to provide an assurance to industry of uniformly enforced standards.

The strategy went some way to acknowledging the limitations of the local authority system in Northern Ireland by proposing to allow the councils to remain as unitary authorities, responsible for waste collection and disposal. However, the strategy did propose removing responsibility for regulation from the councils.

Draft Waste and Contaminated Land (Northern Ireland) Order 1997

The DOE(NI) has stated that this Order should be in force by spring 1997. The order contains the proposals for the implementation in Northern Ireland of Part II of the Environmental Protection Act 1990 and the Environment Act 1995. The DOE(NI) guidance to the above order states that:-

"The principle difference between the provisions which apply in Great Britain and those proposed for Northern Ireland relates to the reorganisation of waste regulation, collection and disposal functions. Proposals for independent regulation in Northern Ireland will be achieved by setting up a new centralised inspectorate within the Department's Environment Service which will exercise powers similar to those granted to the Waste Regulatory Authorities in Great Britain. Responsibility for waste collection and disposal will remain with District Councils."[2]

Waste Disposal Licensing (Northern Ireland)

A disposal licence is required for disposing of controlled waste. These are granted by local authorities under Article 5 (1)(b) of the Pollution Control and Local Government Order 1978 and the Waste Collection and Disposal Regulations 1992. A district council cannot issue a disposal licence unless planning permission or consent for a discharge to a waterway has been granted, if either of these is also needed.

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[2] DOE (Northern Ireland), 1996. Telephone 01232 254754

Section 4

Landfill Policies

This section -

- *provides an overview of the UK Government's policies regarding landfill sites*
- *provides an overview of European policy regarding waste and landfill*
- *gives an overview of Friends of the Earth's views on landfill.*

This section should provide useful background for your campaign. You may not want to read this immediately, but refer back to it later when your campaign is underway and you have found out the basic information.

UK Policy

The UK Government appears to have accepted many of the arguments against landfilling, but is still left with the problem of how to deal with waste without upsetting the vested interests that produce it and manage it. The Government's 1995 White Paper on waste policy sets a modest target for a reduction in the proportion of waste going directly to landfill from 70% to 60% by the year 2005[3]. This is to be achieved partly through various waste reduction and recycling initiatives, but is likely to increase the amount of waste being incinerated prior to landfilling.

In contrast to policy developments within the EU, the UK Government is still supporting the co-disposal of hazardous waste and other wastes. They claim that the decomposition of hazardous materials is supposedly facilitated and accelerated by its disposal together with non-hazardous materials. FOE is strongly opposed to this practice, and the European Commission is proposing to discourage it *(see below).*

Restrictions on the siting of landfill sites where leachate may pose a threat to groundwater is another example where UK provisions appear far more lax than required by the EU. In the UK, a landfill may be permitted close to an aquifer where that aquifer is not a major aquifer, or it is considered that the surrounding geomorphology will provide adequate protection. For further details on this see Annex 5.

There is increasing emphasis on the importance of elaborate leachate containment systems and gas management systems, particularly in relation to bioreactor-type sites which are designed to maintain a high level of moisture[4, 5] (*see Section 5 below).*

The landfill tax

A new tax on landfill disposal was introduced in 1996. The basic tax is £7 per tonne, with a lower charge of £2 per tonne for more inert waste (also referred to as inactive waste). The inert category includes incinerator bottom ash and much contaminated land is excluded completely. Although the tax was ostensibly brought in as a "green" tax for environmental purposes, FOE believes a much higher rate is necessary to promote recycling; a tax should also be levied on incineration. A study prepared for the Government predicted that there would only be a 1% shift towards recycling with the tax at its current level[6].

European Union

European law sets the framework for waste regulation throughout the European Union. This is achieved mainly through legal instruments known as Directives, which are proposed by the European Commission, and then require agreement by the European Parliament and the Council which is made up of Ministers from the

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[3] DoE (1995). *Making Waste Work - A Strategy for Sustainable Waste Management in England and Wales.* London, The Stationery Office.

[4] DoE (1995). Waste Management Paper 26B, *Landfill Design, Construction and Operational Practice.* London, The Stationery Office.

[5] The idea is to maintain high moisture content within the landfill with continual throughput of water, theoretically stabilising the waste more quickly and flushing out pollutants in leachate.

[6] DOE (1993). *Landfill Costs and Prices: Correcting Possible Market Distortions.* A Study by Coopers and Lybrand. The Stationery Office.

EC and UK law

EC laws, known as directives, have to be transposed into national law. For example, an EC Directive may be enacted in the UK through (parts of) an Act, which is primary legislation, through Regulations (secondary legislation), with guidance issued in the form of a Circular or guidance note. Be aware that the UK interpretations of European law may not be absolutely correct and it is always worth checking the original laws. European policy, legislation and drafts are published in the Official Journal of the European Communities, known as the "OJ".

Member States. There is a Framework Directive on waste which sets out the basic requirements and definitions for waste management. A separate Directive exists for hazardous waste. Linked to these two Directives are Directives on waste disposal which at present concentrate on setting standards for incineration *(see Annex 8 for these references)*. However, a draft Directive on landfill[7] has been adopted by the Commission and this is currently being negotiated in the European Parliament and Council of Ministers. The directive aims to encourage: separate collection of organic wastes; sorting, recovery and recycling; capture and combustion of methane (a potent greenhouse gas); and keeping combustible material such as paper and plastic out of landfill.

The Commission is in favour of pre-sorting waste prior to landfilling and also of pre-treating organic waste so that it presents less of a pollution risk and facilitates handling. Pre-treatment might mean composting, digestion or incineration to reduce the organic content of waste. These practices are likely to increase landfill costs significantly.

Commission policy is against co-disposal and the siting of any landfills close to any aquifer. Pre-treatment is incompatible with co-disposal, and, indeed, with the bioreactor approach, because co-disposal and bioreactors require a high organic content in the wastes to maintain the necessary microbiological and chemical decomposition processes.

The draft landfill Directive as it currently stands requires progressive reductions in the landfilling of "biodegradable municipal solid waste". Co-disposal would effectively need to be phased out.

The increased restrictions on landfill are therefore clear and, if passed into law, will undoubtedly affect current UK practice on a national scale. But be aware that it is highly likely that aspects of the draft Directive will change before agreement can be reached and the Directive becomes law.

The favoured alternative is likely to be incineration. Although incineration is highly effective at reducing organic content and is a better understood technology within the industry at present than composting or digestion, it is a highly contentious technology in terms of pollution, resource conservation issues and acceptability to neighbours. FOE opposes incineration.

FOE's View

Whilst Friends of the Earth is not necessarily opposed to *all* landfilling in the short-term, we are opposed to the many sites which are either unnecessary, poorly sited or badly run.

Landfills are unnecessary where the waste concerned could have been prevented or could be managed in some other, more environmentally safe, way. This therefore depends on the lengths to which society, industry, and Government are prepared to go in order to reduce waste production or to re-use or recycle wastes. This may involve considerable investment or regulation which local and national Governments are often reluctant to impose. As discussed below, one of the objectives of a local landfill campaign is to persuade the local authority that the site is unnecessary and the waste could be managed some other way.

Poorly sited landfills are those which allow leachate to threaten groundwater and surface water; where gas may pose a risk to nearby buildings; where habitats may be destroyed; or where pests and traffic movements cause a nuisance. Again, it is often up to those opposing the site to convince the authorities of these potential problems.

Some landfills cause environmental problems because the operators are not bound by adequate controls, or where enforcement of those controls is lacking.

Even where a landfill proposal goes ahead, a campaign may succeed in either improving the operating conditions or in forcing the regulatory authorities to take their duties more seriously.

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[7] Com(97)105, 5.03.1997, 97/0085(SYN)

FOE is opposed to all co-disposal and is not convinced about the feasibility of the "bioreactor" approach.

The waste hierarchy

The options for waste management have been ranked according to their approximate environmental benefit and disbenefit. In the Government's strategy for sustainable waste management, *Making Waste Work (DOE/WO, 1995)*, the hierarchy has 4 levels:

- Reduction
- Re-use
- Recovery (recycling, composting, energy recovery)
- Disposal (landfill, incineration without energy recovery)

Note that "energy recovery" is actually incineration which uses the heat generated for some useful purpose, either directly or to generate power. Schemes employing energy recovery are often called "energy-from-waste" schemes. Because of pollution problems and the destruction of resources by incineration, Friends of the Earth does not believe that energy recovery schemes should be equivalent to recycling (material recovery).

It is important to know that a recent review of the European Commission's Waste Strategy **amended its hierarchy** to distinguish between material and energy recovery, placing energy recovery on a lower run than material recovery. This change has been supported by the Council of Ministers (and thus the UK) in its *Council Resolution of 24 February 1997 on a Community strategy for waste management*, in so far as *"reuse and material recovery should be considered preferable where and insofar as they are the best environmental options" (Official Journal C76/1, 11.3.97).*

In practice, although the waste hierarchy forms a "policy framework", decision-making can take into account costs and the Government has stated that it "continues to support the use of landfill for appropriate wastes...". Nevertheless, the strategy for sustainable waste management, *Making Waste Work (DOE/WO, 1995)*, also says: "*Waste disposal comes at the bottom of the waste hierarchy, as the least attractive waste management option."* You can quote this to argue for more recycling and re-use policies.

Section 5

How Landfills Work

This section -

- *provides an overview of how landfills are constructed and operated.*

This is useful background reading when you are beginning to get into debates about specific features of a landfill.

Landfilling is essentially the technical term used to describe filling enormous holes in the ground with waste. These holes may be specially excavated for the purpose, or may be old quarries, mine shafts and even railway cuttings. More recently the term has been expanded to cover the creation of waste mountains even though there is no "filling" as such. This process is also known as landraising. This campaign guide uses the term "landfilling" to cover both processes.

There are estimated to be about 3,700 operational landfill sites in the UK of which 3,000 are privately operated and 700 run by local authority Waste Disposal Companies (LAWDCs). Additionally there are an estimated 6,000 closed landfill sites - the exact number and location of many of these sites is not known.

Landfills vary a great deal in size and there is a trend towards larger tips accepting huge amounts of waste (in excess of 100,000 tonnes of waste a year in some cases). A Government survey estimated that just 100 sites accept half of the UK's landfilled waste.

This trend towards larger landfill sites has been strengthened by new environmental controls which have increased the costs of developing new sites.

The operational lifetime of landfill sites also varies enormously but it is not unusual for a site to take 10-20 years to be filled. The Government estimates that 250 new landfill sites open each year and that a roughly similar number close.

Types of waste

A variety of terms is used to describe different types of waste, for example, hazardous, municipal or household, inert, special or difficult *(see the Glossary)*. Some terms are used loosely, others refer to specific criteria and legislation - if in doubt about what sort of waste is being proposed for disposal, do ask for more detail.

Wastes are frequently referred to as either *inert* or *bioreactive*. Inert wastes, such as brick or stone, do not undergo change (or "insignificant" change only). Builders' rubble is generally regarded as inert.

In contrast, the organic component of a bioreactive waste decomposes due to chemical and microbiological processes. This may occur only partially or at a very slow rate depending on the conditions in the landfill, but gives rise to gases and noxious liquids which may be further contaminated by other components in the landfill. Higher moisture content speeds up this process. Municipal waste contains a large amount of organic matter, such as newspaper, food and natural textiles and also contains a myriad of substances which are detectable in the liquid leachate *(also see the next section)*.

Hazardous wastes are defined as wastes that are specified by the Hazardous Waste Directive *or* are hazardous for reasons of health or safety risks or pollution risks. The term is not used for waste that has some hazardous component, only if the whole waste is hazardous. So household waste contains toxic metals (eg from batteries) but is not usually defined as hazardous.

Design of landfills

From the earliest times, municipal and other kinds of waste have been disposed of by the cheapest and most expedient method available - ie direct disposal into open dumps. It is only in the last few decades that the associated environmental problems have been seriously addressed.

Since the mid 1970's, the design and construction of landfills has been subject to increasingly exacting standards aimed at minimising environmental impacts. A variety of relatively sophisticated engineering techniques are being used for sites containing all kinds of waste, with the result that the modern landfill is now a complex and highly engineered structure of major proportions.

This section should familiarise the reader with the essential design features of landfills, and with some of the associated technical terminology.

The "dilute and disperse" landfill

Moisture within a landfill percolates down through the waste materials picking up a variety of contaminants from any rotting waste and other components present. The resulting *leachate* can migrate into surrounding soils and may cause serious pollution if allowed to contaminate groundwater or surface waters. In addition to leachate, almost all landfills will generate potentially toxic, explosive and asphyxiating *landfill gas* through the decomposition of organic waste materials. Landfill gas can migrate considerable distances underground and present a serious danger to people and property.

In the past, the potential for leachate pollution and gas migration was not appreciated to the extent that it is today. For all except the most toxic wastes, it was felt that leachate should be allowed to disperse into surrounding soils where its toxicity would be naturally reduced (attenuated) through physico-chemical and microbiological mechanisms. (For this latter reason these types of landfills are sometimes referred to as "bioremediation" landfills.)

Landfill gas migration has only been recognised as a serious threat in the last two decades or so *(see Annex 2)*.

However, now that the seriousness of these problems has been more fully recognised, the appropriateness of the so-called *attenuation* or *dilute and disperse* landfill has been called very much into question.

The "containment" landfill

The concept of the *containment* landfill - whereby the body of waste material is completely encapsulated within a supposedly impermeable barrier - has therefore been developed and used for a much wider range of waste types.

In addition, the containment landfill needs to have incorporated within it complex systems for the collection, handling and management of gas and leachate.

Because of the relatively sophisticated level of engineering which is involved in the construction of these features, and also in the preparation and incorporation of the in-filled waste itself, such a facility is often referred to as an *engineered landfill*. The term *sanitary landfill* is also used and alludes to the ability of the engineered landfill to restrict the off-site migration of gas and leachate, and to the control of vermin and windblown litter during construction.

Engineered landfill design and construction

It may be the case that a convenient hole in the ground of appropriate dimensions already exists. Occasionally, however, landfill construction begins with the excavation of a large area of land (perhaps the size of a football stadium) to a depth of some 30 metres, with the excavated soil being stockpiled around the perimeter or nearby. At this time, a high perimeter fence will also be constructed around the site in order to help contain windblown litter, maintain site security and minimise the visual impact of the construction site within the immediate vicinity.

Liners

Almost invariably, new landfills are now required to incorporate some form of impermeable lining material *(liner*) entirely covering the floor and sides of the excavated area. The purpose of the liner is to prevent the migration of gas or leachate from the landfill into the surrounding environment, and to prevent the migration of groundwater into the landfill.

The liner may be constructed from compacted clay soil *(mineral liner*), or from synthetic plastic sheeting (*geomembrane*), or from a combination of the two (*composite liner*). Unless there are only minimal risks associated with gas and leachate escape, the liner will normally consist of two separate layers (*double liner*).

Leachate which collects above the bottom liner may be removed by means of a *leachate collection system (LCS).* The LCS consists of a system of perforated pipes (about 10cm diameter) set within a layer of coarse permeable material such as sand or gravel immediately through the liner. Leachate drains from the site under gravity and is collected for treatment, disposal or recirculation. Double liners may incorporate a second LCS between the two layers.

Some landfills incorporate a *groundwater collection system (GWCS)* - similar in construction to a LCS - to collect and remove groundwater from immediately below the liner. This prevents pressure building up causing the liner to "float" or rupture.

Liners are usually overlayed with a protective layer to prevent damage in-situ. A range of materials are used including granular materials, plastic sheets or bonded shredded tyres. The LCS or GWCS will provide protection for mineral liners.

Infilling techniques

Waste is usually laid in layers of about 0.5 metre

thickness, compacted by repeated passes by specially designed vehicles (called, predictably, *compactors*). Where wastes are required to be transported to the landfill by road or rail, the material may be pre-compacted into approximately 1 metre cubes which can then be directly laid into the site. Compaction may be enhanced by prior pulverisation of the materials. The primary purposes of compaction are to maximise the capacity of the landfill and to maximise structural stability.

Repeated layers are laid down and compacted within a specific area until the depth of waste reaches 2-3 metres. At this point the waste is covered with 15-30 cm of stockpiled soil, clay, or, in the most sophisticated sites, a composite layer of geomembrane and soil. This daily covering helps to control flies, scavenging birds and rodents, helps to control windblown litter, and minimises the risk of fire. The single series of consolidated layers with a cover layer forms a compartment and is called a *cell*, which usually represents a single day's work.

In this way, consecutive cells are laid down side-by-side until the entire floor area of the landfill is covered. A completed layer of cells is called a *lift*. The entire process is repeated so that successive lifts are built up vertically to a height which may extend up to 35 metres above the original ground surface level.

Where successive cells are laid down into a continuous, horizontal lift, the technique is referred to as the *area method*. A variation on the area method is the *ramp method*, which is more suited to sloping land. Here, cells are constructed in much the same way, except that they are set at an angle to the floor of the landfill - the sloping upper surface of one cell providing the lower surface of the next. The resulting structure is much like that of a series of fallen dominoes.

A further variation is the *trench method*. Here, the land is excavated and filled in a series of successive parallel trenches. Each trench is about 3 metres deep and contains a single lift. Further vertical construction may then continue using either the area or ramp method. The trench method is, however, not conducive to the installation of liners and is therefore restricted to the most impermeable soils.

Whatever method of construction is used, when the required height has been reached, the landfill will receive a final impermeable covering (or *cap*) in order to prevent the infiltration of water (which would produce leachate) and prevent the uncontrolled escape of gas. The cap will usually consist of a metre or so of compacted clay soil and include a layer of synthetic geomembrane. An upper surface layer of topsoil is likely to be added in order to support vegetation cover which will provide the cap with protection against erosion.

Gas and leachate control

During the construction of the landfill, mechanisms must be installed to collect and manage gas and leachate. Gas can be allowed to escape freely from the site via venting pipes (1-2 metre diameter) installed vertically into the body of the waste (*passive venting*). Alternatively, gas can be actively pumped from the landfill via a system of perforated pipes (about 10 cm diameter) installed throughout the body of waste (*active venting)*. The gas can then be burned off by *flaring* or, if the methane concentration is sufficient, the gas can be used as fuel, for example, for electrical power generation. In some cases potential landfill developers have used this power generation as a way of promoting the development of a landfill. However, utilization of landfill gas is a very inefficient way of generating power - since you can only capture about half of the methane generated by a landfill - and the energy generated does little to outweigh the serious environmental disadvantages of a landfill site.

To prevent ponding of leachate at the intermediate layers of covering material, small areas of covering may be removed to facilitate downward drainage. Collected leachate may then be diverted to a tank for treatment on-site, or discharged to a municipal sewage treatment plant. Alternatively, leachate may be pumped back to the top of the landfill and recirculated. "Recycling" of leachate in this way serves to maintain moisture levels within the landfill, thereby increasing the rate of decomposition of the wastes. This reduces the amount of time required for the landfill to become structurally stable and also increases the rate at which landfill gas is generated. A high rate of gas generation is desirable where the gas can be commercially utilized, and also minimises the length of time that gas production will require monitoring after closure of the site.

Bioreactor landfills

The *flushing* or *enhanced bioreactor* concept has been recently devised in an attempt to reconcile landfill of wastes with the concept of sustainable development[8]. The essential theory is that, by introducing water into the landfill and by allowing a continual throughput of water, stabilisation of the waste is achieved more quickly and pollutants are flushed out in leachate for

[8] DOE (1995). Waste Management Paper 26B. The Stationery Office.

treatment.

This approach contrasts with the hitherto accepted preference for maintaining dry conditions within the landfill in order to minimise leachate.

Despite the enthusiasm of the Department of the Environment (DoE) for the enhanced bioreactor approach, it has not been well received by the landfill industry who are concerned about the practicability of the concept. The most fundamental flaw is the problem of the time required for *completion* to occur and the rate of water infiltration required over that time. *Completion* is the state whereby gaseous and liquid emissions from the landfill no longer represent a pollution hazard. Where an engineered low-permeability cap is constructed - necessary for the control of gas releases - then rainfall infiltration into the landfill is likely to be only around 100 mm per annum. At this rate of infiltration, the period required for a single flushing of a typical 30 m deep landfill would be in the region of 100 years[9]. In fact, it is likely that at least 6 complete flushings would be required to achieve completion.

If water were to be added in order to increase the rate of flushing and thereby accelerate completion, there would be a commensurate increase in the rate at which leachate (and gas) are produced. For sufficient water to be added to bring about completion within 50 years, the rate of leachate production would require treatment capacity far in excess of that at any currently operating site.

Co-disposal

This is the practice of mixing hazardous wastes with municipal or similar wastes in order to help neutralise or degrade the industrial waste. If adopted, the draft landfill Directive (*see Section 4*) will curtail this practice.

In a survey of monitoring data from co-disposal sites in East Anglia, Friends of the Earth found evidence of dangerous substances leaching from the landfills at 8 of the 9 monitored sites[10]. Pesticide wastes at a co-disposal site in Cambridgeshire contaminated an aquifer and led to the closure of a public water supply borehole until water treatment equipment could be fitted.

Regulatory aspects

Standards for the design, construction and operational practice of landfill sites are specified within DoE Waste Management Papers (WMP). WMP Series 26 (several papers) relates specifically to landfill sites.

The regulation of landfill sites and the permission for building and operating them are covered in later sections in this guide.

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[9] H. Robinson (Aspinwall and Company - environmental consultants) in *Surveyor*, 6 June 1996.

[10] Friends of the Earth (1994). *Hit or Miss? Groundwater Contamination Associated with Landfill Sites in East Anglia.*

Section 6

Introduction to the Environmental Problems Associated with Landfill Sites

This section -

- *provides an overview of the environmental problems associated with landfill sites and the risks they pose to wildlife, people and property.*

Water pollution from landfills

A Government-commissioned study of 100 landfill sites revealed that, of those sites which had monitoring, half had experienced surface or groundwater pollution and of these only half had taken action to try to control the problem[11].

Leachate - which is formed when water passes through waste in a landfill site - is typically a dark and smelly liquid, the composition being largely dependent on the types of waste in the landfill. Ammonia is a major pollutant of leachate,but there will be a wide range of other chemicals in varying amounts. Leachate can be extremely polluting. If it escapes from a landfill and pollutes nearby surface or groundwater it can have a profound effect on water quality.

A river or stream that has been badly polluted by landfill leachate is usually stained and lacks the normal variety of animals and plants. Chemical reactions with leachate, and the action of bacteria which feed on it, remove oxygen from the water, suffocating aquatic life, and toxic compounds (such as ammonia) cause poisoning. Additionally tiny particles such as iron compounds suspended in the leachate can be deposited on the river bed smothering aquatic life.

In addition to the pollution of the surface water, there is a serious threat to groundwater. Many parts of Britain rely on reserves of groundwater for their drinking water. In England and Wales, a third of all drinking water comes from underground "aquifers" - layers of porous rock which hold huge quantities of water (like a sponge). In a recent (1996) survey by the Environment Agency, landfill sites accounted for one third of sources of groundwater pollution[12].

Pollution in groundwater lasts much longer than on the surface because of the lack of light, warmth and oxygen to encourage the breakdown of the pollutants by micro-organisms. Groundwater pollution is also very difficult and expensive to clean up.

Rainwater and flood water can pick up contaminants as it flows across the surface of the landfill, and then pollute water courses when it drains from the site as "run-off ".

Coping with leachate. One of the main options for dealing with leachate is to pump it out and discharge it into a watercourse or sewer, for which permits must be obtained *(see Section 11 on waste management licensing)*. Neither disposal route will make the persistent toxic chemicals such as heavy metals magically disappear. Metals from the leachate can end up in the sewage sludge and effluent that sewage treatment works produce.

Often the landfill operators will have some kind of treatment system on site to make the leachate less polluting before it is discharged. In some cases leachate is sprayed onto land or even pumped into tankers and taken to other landfill sites.

Landfill gas

The other key pollution problem at landfill sites is the leakage of gas *(also see Annexes 2 and 3).* As the organic wastes (such as paper, cardboard and foodstuffs) decompose within a landfill site "landfill gas" is generated.

The main constituents of landfill gas are methane and carbon dioxide. Landfill gas can also contain a wide

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[11] Croft, B. and Campbell, D. (1990). *Characterisation of 100 Landfill Sites.* Paper presented at Harwell Waste Management Symposium. Environmental Safety Centre, AEA Technology, Oxfordshire.

[12] Environment Agency (1996). *Groundwater Pollution - Evaluation of the extent and character of groundwater pollution from point sources in England and Wales.*

variety of contaminants such as volatile organic compounds[13], and particular chemicals may be present if they have been disposed of at the site.

If the methane reaches a concentration of over 15 per cent it becomes explosive. Landfill gas can move underground away from the site and appear at the surface more than half a kilometre away from where it started. There are several recorded cases of landfill gas explosions which have damaged property and injured people.

As well as posing a risk of explosion, landfill gas can also damage vegetation by displacing oxygen from around the roots of plants.

Methane also has a global significance since it is an important "greenhouse gas" which contributes to global warming and climate change. Landfill sites account for about half of all UK methane emissions.

Landfill gas can be flared or captured for combustion and energy recovery, which converts the methane to carbon dioxide, a greenhouse gas itself but less potent than methane. Most of the existing sites in the UK have no such controls over landfill gas, but new sites will always have equipment to capture methane (although they are unlikely to capture more than half the gas generated within the landfill).

Landfills will continue to generate gas until all the waste has decomposed and it is estimated that they will do so for many years after the last deposit of waste.

Nuisances

Landfilling waste can give rise to a range of "nuisances", such as noise, odours, smoke, dust, litter, birds, rats and flies. These can make life uncomfortable for people living close by.

Landfill sites often generate objectionable smells due to the decomposition of waste. This problem can be reduced by depositing waste immediately, compacting it, minimising the amount of water present and providing adequate cover - e.g. a layer of soil at the end of a day.

Pests such as birds (particularly gulls and crows) and rats are attracted to landfills in their search for food. Control measures for birds include fixed or mobile nets, bird scarers, distress calls or falcons but these are relatively expensive and only partially effective.

In the summer, the presence of decomposing waste can also attract flies. This may be a particular problem if there is a delay between the collection and final deposit of the waste, since eggs laid in the waste can hatch before disposal (the life cycle of the housefly is only 10 days in hot weather).

Depending on the location, wind can sometimes blow litter from the landfill site onto neighbouring land. This can be minimised by depositing the waste in a sheltered environment or in individual cells which can be covered quickly. Walls, fencing or mobile nets can also be used to trap stray litter. The problem can also be reduced by "bagging" items liable to be blown away in the wind (eg paper and plastic) or by compacting and covering the waste immediately.

There can also be considerable noise generated by the machinery and vehicles operating at a landfill site. While a degree of soundproofing can be achieved by the use of huge barriers, this is usually only partially successful.

Transporting waste. Apart from the problems that arise on-site through landfilling waste, there are also significant impacts associated with vehicles transporting waste to the disposal site and the empty vehicles returning to collect more waste. In fact, the transport of waste may be a bigger headache for people living near a landfill than the actual disposal of the waste.

Most waste is transported by road (94 per cent) although a small amount of waste is transported by rail (4 per cent) and barge (2 per cent). In general the impact on local roads from a new landfill site will be severe. Although the number of lorries will vary greatly depending on the size of the landfill site there will often be problems of noise, dust, vibration, traffic congestion and an increase in the likelihood of accidents. Most applications for new landfill sites will include proposals for widening and improving the road access to the site to alleviate some of these problems.

Hazardous waste

The nature of the waste may be a hazard itself and campaigners should try to find out what wastes might be accepted or licensed. Organic chemicals are of particular concern. Various studies in the US around hazardous waste sites have noted a variety of adverse health effects and, although there are limitations to the studies, there is clearly cause for concern around some

[13] Volatile Organic Compounds (VOCs) are organic compounds (such as solvents) which form a vapour at ambient temperatures.

sites[14].

Restoration and redevelopment of landfill sites

Landfills represent a significant proportion of contaminated land sites. Contamination is caused by the toxics within the waste and poses a variety of risks to public health and the wider environment. The contamination makes subsequent development on the site particularly problematic.

After the completion of landfilling, the site is restored so as to allow productive use of the land. The restoration usually consists of sealing the surface of the site ("capping") with a low permeability material and then covering it with soil and vegetation.

There are a number of problems associated with the restoration of landfill sites.

Settlement. Settlement of the waste due to decomposition will continue long after tipping has ceased and can reduce the volume of the infilled waste by up to a quarter. Whilst extra waste can be tipped on the site to above ground level, to try to compensate for the subsequent depression, it is very difficult to predict accurately the degree of settlement and ensure that it happens evenly across the site. Uneven settlement can disrupt the cap, allowing water in (increasing leachate production) and allowing gas to escape.

***Cap Stability*.** The long term stability of the cap is questionable. As discussed in Annex 6 on liners, clay can crack if it becomes too dry whilst the performance of synthetic membranes over long periods has not been tested.

Subsequent use of the land may also cause damage, with the plant or tree roots damaging the integrity of the cap.

Risks posed by restored sites

Direct hazard to human health. Given the problems of site restoration, wastes may become exposed at the surface so allowing exposure through direct contact with the contaminated soil or through ingestion or inhalation of contaminated soil or dust.

Hazards to plants. The wastes may also be toxic to plants and prevent their growth. In some cases the plants can take up the toxic substances (eg lead). In the case of vegetables or other food crops, this can then pose a hazard to humans.

Fire hazard. The presence of combustible waste materials in the landfill site may be a fire risk. They can ignite through self heating or a reaction with another material present in the site. These underground fires, which can smoulder away for years, are very difficult to put out.

Landfill gas. Gas can continue to be generated for decades after site closure and continue to present risks of fires and explosions, asphyxiation and damage to vegetation.

Leachate. Toxic leachate can continue to pose a risk for a decade or even longer.

Problems associated with redeveloping landfill sites

The risks posed by contaminated land, leachate, landfill gas, fire and settlement all make the redevelopment of a landfill site particularly problematic.

Some of the wastes may actually corrode building materials. The contaminants can therefore undermine the foundation of buildings as well as damage service pipes.

Current (draft) advice is that buildings should not be built on restored landfill sites apart from in exceptional circumstances[15]:

*"The operator or developer **must** be aware of the risks and consequent costs of built development on landfills, and the fact that, apart from exceptional circumstances, this form of after-use is not advised."*

Also *"... toxic substances or chemicals in the fill which may attack building materials"* are described as one of the principal hazards.

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[14] Congressional Testimony (104th Congress) before the Subcommittee on Superfund, Waste Control and Risk Assessment. Testimony by Barry L Johnson, Ph.D., Assistant Surgeon General, Agency for Toxic Substances and Disease Registry, US Department of Health and Human Services.

[15] Environment Agency (1996). Consultation Draft of Waste Management Paper 26E, *Landfill Restoration and Post Closure Management*. This will be a (part) revision of WMP 26 and should be published in mid -1997.

In the earlier Waste Management Paper 26 (1986), the Government stated:[16]

"Engineered containment landfills should not be built on. Any development is likely to destroy the integrity of the impervious cap and piling through the landfill to the underlying strata inevitably will compromise the containment."

The Government guidance suggested that there is likely to be less of a problem with older, shallower, "dilute and disperse" landfill sites *(see Section 5)*, but admitted that:

"Building has taken place on old landfills, though the number of such developments and the short time that has elapsed since construction, makes it difficult to judge its success."

The problems posed by inappropriate redevelopment of landfill sites are complicated by the lack of information on the locations of many of the estimated 6,000 closed landfill sites.

For further information on landfills as contaminated land, see the FOE publication *"Buyer Beware: A Buyer's Guide to Contaminated Land"*.

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[16] DoE (1986). Waste Management Paper 26, *Landfilling Wastes*. The Stationery Office.

Section 7

Establishing the Facts about a Proposal

This section -

- *identifies the information you will need for your campaign*
- *offers tips on how to get the relevant information.*

A good campaign needs to carry out some research before it can begin. This section is essential reading before the campaign is launched.

Before you take any action against a landfill proposal, you will have to do some research to establish exactly what stage it has reached and what exactly is being proposed.

It is important to move fast when you first hear about a proposal. When a formal application for planning permission is made, you will have only 21 days in which to submit an objection. The amount of detail which you will be able to include in your objection will be limited by the time available.

Right at the outset, you will need to establish:

- the location of the proposed site
- the identity of the proposed operator
- the identity of the proposed developer
- whether planning permission has been applied for or granted
- whether planning permission is required
- whether a waste management licence has been applied for or granted
- what kind of waste that the site will accept.

- **Contact the Local Planning Authority (LPA)**

Ask the LPA whether they are aware of the proposal. If planning permission is needed *(see Section 10)*, they will be able to give you the location of the proposed site as well as the name and address of the developer (and possibly the operator) and they will tell you the stage it has reached in the planning process. Indeed even before the planning application is formally submitted the LPA is likely to have been in informal contact with the proposed developer over the proposal, so contacting the LPA early may give you a head start on your campaign.

The Planning Register

You have a right to see the full planning application and supporting documentation free of charge (probably at the planning Department of the Council) and to obtain copies for a reasonable charge. Those documents will give you all the details you need in order to establish the basic facts.

When the planning application is submitted, the developer is required to advertise the proposal in the local newspaper and display a notice at the site of the proposed landfill for 21 days. Nevertheless, write to the LPA beforehand, expressing an interest in the proposal, and asking them to notify you as soon as the planning application is submitted. They don't have to notify you but they may well agree to do so.

If planning permission is not required, then the LPA may still be able to give you details since they may have been approached for an opinion on the necessity for planning permission.

- **Contact the Environment Agency**

Your local office of the Agency should be able to tell you whether a WML has been applied for and whether it has been granted. They may, however, have difficulty in identifying the Application if you cannot give them any details about the exact site or the name of the proposed operator.

If a WML application has been made, the Agency will also be able to give you the identity of the developer.

Write to your local Agency office, asking them to notify you as soon as the WML application is submitted. Again, they don't have to notify you but they may agree to this.

- **Contact the landowner and/or occupier**

You may be able to work out the identity of the owners or occupiers of the site by paying a visit. Alternatively, the relevant district office of the Land Registry may be able to advise you. Once you have identified the owners or occupiers you can ask them directly about the proposal and who's making it. Once you have your initial information, check with the LPA and the Agency.

- **Contact the would-be developer and operator**

If you have some idea who either of these parties are, it may be worth contacting them directly to get the basic facts. You only need a few details in order to check things out with the Agency or the LPA. Do bear in mind though, that the developer and operator are not obliged to tell you anything and they may be unwilling to answer your questions. A degree of tact, diplomacy and persistence is likely to be required.

- **Talk to the site investigators**

In order to provide the regulatory agencies with the information that they need, the developer must carry out certain tests and investigations on the site - checking the geology and hydrology of the site, for example. The first sign of a landfill site proposal is often when people are seen in the area carrying out surveys. Various tests may be carried out for some time prior to the planning application being made. Talk to these people and see what you can find out.

- **Contact other friendly organisations**

There is a fair chance that other interested organisations such as conservation groups or residents' associations will have taken an interest in rumours of a landfill proposal, so it's worth contacting with them for clues and to share information.

- **Find out whether planning permission is required**

Section 10 lists the circumstances under which a landfill may escape the need for planning permission. Contact the LPA and ask them whether the proposal requires planning permission. If you are advised by the LPA that planning permission is not required, ask them to clarify (and confirm in writing) the grounds on which it is not required. You are then in a position to examine the terms of the particular provisions and make your own judgement as to their validity in your case *(see Section 8)*.

Where the LPA has some discretion in requiring planning permission, you may be able to persuade them to do so if you can show that there is strong feeling about the matter in the community.

The Waste Management Licence Register

An important feature of the current waste management licensing system is the establishment of a public register of information relating to licences, licence applications, revocation notices, etc. This register is held at the local offices of the Agency where it can be inspected. Copies of documents can be obtained for a reasonable charge. Previously, very little information about landfill sites was available on public registers. Information should be placed on the register by the Agency as soon as reasonably practicable after it is received.

There are lots of changes afoot at the Environment Agency, so, if you want to look at the register, it is best to call first and check exactly where is the office which holds the relevant paperwork.

Certain limited information relating to your local area should also be kept at the offices of your local waste collection authority - WCA (part of the local authority). The WCA register holds only information relating to licences which have already been issued and will not, for example, include copies of applications for new licences.

A full list of all the matters which should appear on the register is set out in Regulation 10 of the Waste Management Licensing Regulations 1994[17]. Also see Sections 64-66 of the Environmental Protection Act 1990, paragraph 11 of the Regulations and Annex 9 of DOE Circular 11/94, (also known as Welsh Office Circular No 26/94) for information about the Register.

[17] Statutory Instrument 1994/1056.

Section 8

Who Gives Planning Permission for Landfill Sites?

This section -

- *describes when landfill sites need planning permission*
- *details who gives the permission*
- *discusses the official guidance given to the decision- makers*
- *looks at the rights of appeal if a planning application is granted or refused.*

This section is essential reading so that the group understands "the rules of the game" whilst it is campaigning to stop the council giving planning permission for the landfill site. This section should be read in conjunction with the next two sections where we cover the planning process and lobbying in more detail.

Landfill operations are subject to regulation from four main standpoints:

- As a development subject to ***planning control***, and therefore requiring planning permission (discussed in this section).
- As a ***waste management*** facility, requiring a waste management licence and being subject to the "Duty of Care" (discussed in Section 11).
- As potentially affecting ***water quality*** through polluting discharges to ground and surface waters, requiring a permit from the Environment Agency (discussed in Section 11).
- As operations with implications for the ***health and safety*** of the work-force (discussed briefly in Annex 7).

Landfills are also a potential source of ***statutory nuisance*** to local residents (discussed in Section 11 and Annex 7).

Planning Control

What is planning permission?

Before beginning any building operations or any "material" (significant) change of the use of land, it is usually necessary to obtain permission from the planning department of the local authority. The actual planning permission itself takes the form of a document which will specify the person to whom permission is granted, the date it was granted, a description of the site and any number of conditions which the operator must comply with. The conditions that are required are often the subject of negotiation between the applicant (the developer) and the planning department.

The planning system is designed to control the location and siting of development and, for waste projects, is operated through the County Council (or Unitary Authorities, or the DoE in Northern Ireland - *see Section 3*). The planning system focuses on whether the development itself is an acceptable use of land, rather than the day-to-day control of the processes or substances themselves. Planning permission is, however, usually granted with *conditions* which are intended to prevent the development from causing undue nuisance to the surrounding area. Planning permission is also usually required to extend an existing landfill site.

The part of the Council which is responsible for granting planning permission is referred to as the *Local Planning Authority (LPA).* A *developer* is the company or person who applies for planning permission. The *operator* is the company which operates the site from day to day. The operator and/or developer usually applies for the waste management licence *(see Section 11).* At larger sites the developer and operator will normally be the same company.

If you want to see what a planning permission looks like, go along to the planning department of your local authority which deals with planning applications for landfill sites and have a look. The LPA is obliged to keep copies of all applications, together with any documents in support, on a register. You can look at the register for free, although they are entitled to charge you a reasonable amount for copies.

If possible, you should concentrate your efforts on opposing the planning application, for the following reasons:

- The planning process offers an opportunity

for members of the public to have formal input. No such formal opportunity is offered during the consideration of a licence application.

- The grounds for rejecting a planning application are wider than those for a waste management licence.

- Planning permission is generally the first stage. It is needed before a licence application can be considered, although the different applications can be submitted in parallel and the licence application can be considered immediately after planning permission has been granted.

If you can get the planning permission refused you have won your battle.

Is planning permission needed?

Planning permission will almost certainly be required for a landfill proposal, or an extension to an existing landfill, but there are a few exceptions to this rule:

- The Town and Country Planning (General Development Order) 1977 is a Statutory (legal) Instrument which defines certain waste disposal activities which do not require planning permission. These are, broadly, the continuing disposal of waste at sites operating before 1948, waste disposal of dredgings, waste disposed in road maintenance, the continuing deposit of mineral excavation by mineral undertakers and the disposal of waste by certain statutory authorities.

- *Special Development Orders* (SDOs) are similar to GDOs but each relates to specifically defined geographical regions. SDOs are also issued by central Government as Statutory Instruments and may have implications for landfill developments.

- The landfill may be part of the aftercare provisions of a minerals working (such as a quarry or mine) where planning permission was given at the time that permission was given for the mine/quarry.

- *Established Use Certificates* (EUCs) are documents issued by the LPA certifying that the particular use of the land has gone on for a number of years, meaning that planning permission would not be required.

- *Certificates of Lawful Use Or Development* have now superseded Established Use Certificates and are also issued by the LPA. It is possible to challenge the certificate by appeal to the Secretary of State.

- There are areas called *Simplified Planning Zones* (SPZs) where the local authority has decided that, in order to encourage development, certain kinds of development shall not require planning permission. These are very rare, and extremely unlikely to be applied to landfills. SPZs were originally set up as a mechanism to encourage regeneration after World War II and are no longer used.

Contact the Local Planning Authority (LPA) and ask them whether the proposal requires planning permission. If you are advised by the LPA that planning permission is *not* required, ask them to clarify (and confirm in writing) the grounds on which it is not required. You are then in a position to examine the terms of the particular provisions and make your own judgement as to their validity in your case. For instance, check the details of the various certificates or Orders and check the details of mineral workings aftercare provisions. You may then be able to challenge them if you feel justified. Depending on the circumstances, you may be able to challenge the LPA through the Local Government Ombudsman (a sort of watchdog on how local authorities behave - contact details can be obtained from your local library), or by Judicial Review (a High Court review of the decision-making process - potentially very expensive) if you feel that you have the necessary resources and a strong enough case.

Where the LPA has some discretion in requiring planning permission, you may be able to persuade them to require an application if you can show that there is strong feeling about the matter in the community.

The planning system and public inquiries

The Planning Authority

Councils are governed by a system of committees of elected councillors, and run on a day-to-day basis by paid employees of the Council (called officers). Generally there is a committee for each service department of the Council as well as an overall policy committee which deals with the wider issues. These are called standing committees, one of which will be the Planning Committee.

Councillors are appointed to the various committees, with the size, composition and membership of the committee decided at the Annual Meetings. Councillors

are also referred to as "Members of the Authority". The committees can set up sub-committees, working parties or advisory committees to make recommendations on specialised aspects of policy.

Each committee is advised by officers from the department to which the committee is attached. The role of officers is to review planning applications, make recommendations and generally provide technical advice.

Decisions on planning applications are therefore reached through a combination of technical appraisal and recommendation by officers in the Planning Department, followed by approval or rejection by the Council's Planning Committee. However, in order to relieve the workload on the Committees, decision-making powers on planning applications are often delegated by the Committee to the officers. The Committee may choose to retrieve those powers in the event of a particularly contentious or politically sensitive proposal.

There are more details on the structure of local authorities in Section 10.

Development Plans

Authorities cannot make arbitrary decisions about planning, but must refer to an important set of documents which sets out the Authority's policies and intentions with respect to its planning responsibilities. This is the ***Development Plan***.

The Development Plan is composed of several component plans:

- the Structure Plan (prepared by County Councils)
- the Local Plan (prepared by District Councils)
- the Unitary Development Plan (a combined Local and Structure Plan for Unitary Authorities)
- the Minerals Local Plan (prepared by County Councils)
- the Waste Local Plan (prepared by County Councils).

The ***Structure Plan*** is drawn up at county level by the County Council and sets out policies and proposals in a broad brush way under headings such as employment, housing, education and recreation. Structure Plans must include policies for the conservation of the natural beauty and amenity of the land, and the improvement of the physical environment.

The ***Local Plan*** is prepared at District Council level and deal with local issues in a much more detailed way than the Structure Plan - e.g. what can be built where. Local Plans have to be in general conformity with the Structure Plan; applying the policies of the structure plan and relating them to particular defined areas of land. Unitary authorities have combined both the Structure and Local Plan into a single document called a ***Unitary Development Plan*** or UDP.

The ***Waste Local Plan*** is compiled by the County Council and is crucial to your campaign. It specifically addresses the land-use implications of the local authority's waste policies, and the need for waste disposal sites and facilities. It will indicate suitable locations for waste sites taking into account local geology and hydrology. It can be, but is not always, combined with a ***Minerals Local Plan***. This is a plan formulating the authority's policies in respect of the mining and working of minerals, and the deposit of mineral waste.

It is the Local Plan and the Waste Local Plan that are likely to be the key documents in your campaign. LPAs will treat them as the most important factors in determining whether or not to grant planning permission for a new landfill site. They are under a legal duty to ensure that their decision is in accordance with the development plan unless "material considerations" indicate otherwise. It is essential, therefore, that you see a copy. The plans are public documents and should be available either in your local library or at your town hall/civic centre. If they are at the library, it may be possible to borrow them for a while. If not, photocopy relevant passages.

It may be that part of your objections will be that there are sufficient waste disposal facilities just outside your area. Investigate this by looking at the Local Plans of surrounding districts and compare them with yours.

Waste Local Plans have to be consistent with Waste Disposal Plans.

Even more plans!

In addition to the above plans, which are part of the formal planning process, there may be further documents which are entitled "plans" which may be useful.

Waste Disposal Plans were prepared in some areas (but not all) by a former type of local waste management body, the Waste Regulation Authority. (These are now absorbed into the Environment Agency.) If one exists for your area it may contain the following useful information:

- how much waste is produced and of what kind
- the quantities and types of waste to be brought into and taken out of an area
- the operating standardsof disposal sites
- priorities for the methods of disposal or treatment of waste.

Recycling plans are drawn up by waste collection authorities. These need to contain the local strategy for recycling (although there is no legal obligation to actually carry it out). They are likely to be revised in 1997 or 1998.

Non-statutory waste strategies also exist in many areas. Whilst they do not have formal legal standing, they are often drawn up at an early stage of strategic decision making, sometimes with a public consultation element. It is well worth getting involved in lobbying the authority at this stage.

As with other parts of policy around landfill, the situation is constantly changing. For example, at the time of writing there is a draft proposal to find a way of integrating the functions of the waste authorities and the planning authorities.

Planning Decisions

Planning decisions (ie the way in which planning applications are determined) are based on a combination of existing national, European and local policy, and on the merits of the individual proposal. The LPA is under a legal duty to ensure that their decision is in line with the Development Plan unless "material considerations" indicate otherwise. In turn, the Development Plan is required to take into account national and regional guidance and the legal requirements of European Directives such as the EC Framework Directive on Waste[18].

The LPA's decision on the proposal will therefore be based on:

- central government guidance contained in Department of the Environment Circulars, Planning Policy Guidance Notes (PPGs), Regional Planning Guidance (RPGs) and Waste Management Papers (WMPs)
- existing local and District Council policy about waste management practice, as described in the Development Plan
- the requirements of relevant EC Directives
- previous Court Judgements in relation to Appeals on similar cases
- the merits of the individual proposal as described in the planning application.

Once a planning application has been made by the developer, the LPA is under a legal duty both to advertise it in the local press and either post a site notice in at least one place on or near the land for at least 21 days, or serve a notice on any owner or occupier of any land adjoining the land. There may also be advertisements placed in relevant trade journals.

The LPA is then required to determine the application one way or the other within 8 weeks of the date on which the application was received, or 16 weeks if an Environmental Statement is required (although this period is often extended by agreement between the LPA and the applicant). (See Section 13 for details on Environmental Statements.)

"Call in" of an application

In particularly contentious cases, the planning application may be "called-in" by the Secretary of State[19] . In this case the planning application is taken out of the hands of the LPA and determined by the Secretary of State. The Secretary of State will only call in an application where planning issues of more than local importance are involved. These include, for example, cases which could have wide effects beyond the immediate locality; give rise to substantial regional or local controversy; conflict with national policy on important matters; or involve the interests of foreign governments.

The decision to call in an application is most likely to be made by the Regional Government Office. It is well worth lobbying them from the very start (especially if you are concerned about the LPA's bias). It is worth finding out the name of the head of planning in the GO and address them personally in letters. It is also worth

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[18] Council Directive on waste, 75/442/EEC (Official Journal L194/39 of 25.7.1975), as amended by 91/156/EEC (Official Journal L78/32 of 26.3.1991), commonly referred to as the Framework Directive on Waste.

[19] The Secretary of State for the Environment, or, in Wales, the Secretary of State for Wales.

letting the LPA know that correspondence is being copied to the GO. It keeps them on their toes!

A call-in will result in a public inquiry, presided over by an Inspector from the Planning Inspectorate, to decide the application (or rather, make a recommendation to the Secretary of State). Inquiries also may be held following an applicant's appeal against a planning decision, and are therefore discussed in greater detail below.

The LPA can, within 21 days of the application being made, insist that any planning application be accompanied by an environmental statement which fulfills the requirements of the Town and Country Planning (Assessment of Environmental Effects) Regulations 1988[20].

Appeals and Inquiries

If the LPA rejects a proposal, or if the LPA fails to determine the application within the eight week period, the applicant (and only the applicant) can appeal to the Secretary of State (via the local office of the DoE) who will then instruct the Planning Inspectorate to hold an inquiry to decide the issue. The Secretary of State has the power to take over (recover) any planning appeal for his/her personal decision, but only does so in cases of great controversy or national importance.

Appeals by the Public

Once planning permission has been granted, the public in this country (unlike in Ireland or the Netherlands, for example) have no right of appeal to the Secretary of State (Planning Inspectorate). However, an "aggrieved person" can, within six weeks, appeal on legal and procedural grounds to the High Court. A person with a "sufficient interest" can also seek a judicial review (for which they must act "promptly" and in any event usually within 3 months). These are High Court procedures which essentially review the process of the decision-making and whether the duties of and powers available to the decision-makers have been used properly. The High Court decisions can be appealed (by either party) to the Court of Appeal, and thence to the House of Lords, and can be referred to the European Court of Justice for cases involving European law. This can be extremely expensive and, if you lose, you will probably have to pay the other side's costs. This guide does not cover appeals and judicial review, and a solicitor/barrister would be essential if you are to contemplate such action.

[20] SI 1988/1199.

Appeals by the Applicant

An appeal against a refusal can only be made on the grounds that:

- the LPA have taken into account matters which are irrelevant, or
- the LPA has failed to take proper account of matters which are relevant, or
- the decision is so unreasonable that no reasonable LPA could have come to that decision.

Any appeals must be made within 6 months of a decision. When appealing, the appellant first lodges an appeal form and supporting documents with the Planning Inspectorate. They must also send a copy of the appeal form to the LPA together with all other documents submitted to the Inspectorate not previously seen by the LPA.

The Planning Inspectorate will ask the LPA to advise all interested parties of the appeal. A copy of any written objections that were made to the LPA will be sent to the Inspectorate for consideration. The Inspectorate then notifies the appellant and the LPA of the date of the inquiry, and appoints the Inspector who is to decide on the case.

The inquiry involves a complete re-hearing of the issues and may take the form of an inquiry by written representations which is conducted in private, by an informal hearing or by a public inquiry. The developer may be offered a choice as to which way the inquiry will be held, but the LPA may insist on a public inquiry if there is sufficient local interest. Appeals in relation to major decisions such as a landfill proposal will almost inevitably be held by public inquiry.

If you have a strong case and public support, a public inquiry offers the best opportunity for opposition views to be expressed and convince everyone of huge public antipathy to the project. It attracts more publicity and there is a possibility of costs being awarded against the appellant should they lose. If you are keen to have a public inquiry, then you should write to the LPA and the Planning Inspectorate to press for this.

The Public Inquiry

We do not go into a huge amount of detail here - the technical ground is the same whether your objection is to the LPA or at the public inquiry. There are some useful publications, including a FOE briefing on attending a public inquiry which cover this in more

detail if you get to this stage (see Annex 8 for list).

If you submitted an objection to the initial planning application, you will almost certainly be informed about the inquiry.

A public inquiry is a formal affair.There will probably be a pre-inquiry meeting some weeks before the inquiry, which will clarify procedures and may even touch upon the issues that will be under discussion. The merits of anyone's position will definitely not be discussed - the meeting is to lay out the practical arrangements. You will be able to ask questions and even make practical suggestions - eg for interpreters or wheelchair access.

Find out the timetables, and note when and where you will be required to submit evidence.

Your main contribution to the inquiry itself will be a *proof of evidence*, essentially a statement describing who you are and why you are interested, and stating your objections. This should be submitted before the inquiry begins - usually three weeks before. You will be able to see other parties' statements of case and proofs of evidence, although not everyone manages to submit everything on time, so keep checking that you have everything. At the inquiry, you will be able to cross-examine the other parties, and they will be able to cross-examine you. Try not to be intimidated by this prospect - you have a right to have your say and your background research will pay off. Also remember that other events may occur which will affect the developer's proposal, so the delay to the planning decision caused by the inquiry procedure may work in your favour.

You may want to take on professional or legal help, but this is not essential. Read Larne FOE's account of their experience in Section 14.

Appeal decisions (ie the decision after the public inquiry if one was held) can be challenged in the Courts, within 6 weeks of the appeal decision. Appeals can only be challenged on legal grounds, not on planning merits or matters of opinion. You will probably need more legal advice than we can give. But by this time, you will probably be an expert in campaigning or may well have an expert solicitor supporting your campaign!

And keep on building public support and lobbying!

Section 9

Objecting to the Planning Application

This section -

- *guides your group through compiling its objection to the planning application*
- *suggests useful potential allies who may be able to provide you with evidence in your objection*
- *details the grounds on which you can object to the application (the rules of the game)*
- *suggests information you will need to include in your objection.*

This section is essential reading when your group compiles its objection to the planning application.

Because of the significance of planning permission in most landfill proposals, the main focus of your campaign is likely to be on persuasion of the Local Planning Authority (LPA) to reject the planning application. The formal objection that you submit to the LPA is one of the means by which you will hope to do this. But you should also encourage as many people as possible to submit a letter of objection to the proposal since such representations from the public are a powerful influence on the LPA in determining the planning application. The letters need not all be of a technical nature.

Help!?

There may be a "planning aid service" able to help in your area. Get in touch with the Royal Town Planning Institute[21], ask for the local contact and then see what sort of help they can give. For example, "Planning Aid for London" is a charity with full-time paid staff whilst other areas tend to have networks of volunteers run by branch members of the RTPI. But it is quite possible that a caseworker would love to take on a local fight against a landfill and it's always worth asking.

The process

When the planning application has been submitted, the LPA has eight weeks in which to make a decision to allow the development or to reject it (or 16 weeks if an environmental statement has been submitted - *see Sections 9 and 13).* During that time, they will seek the views of a number of interested organisations ("consultees") in order to obtain the information upon which to base their decision.

Your objection

The LPA will also consider the views of any other group or individual who wishes to object to the proposal. **Objections must usually be submitted within 21 days of the application being submitted, although the period can be as little as 10 days.** This is not long at all and will limit the detail that you can go into in your objection. Be aware that controversial planning applications may deliberately be announced at inconvenient times - such as just before Christmas - in order to minimise the level of objection that they might provoke. The LPA may be persuaded to extend the period of consultation if there is sufficient feeling in the community.

If utterly squeezed for time, you could try submitting an outline of your objections and follow up with more details as soon as possible. Speak to a council officer about this - they may well be sympathetic and give you an idea of what is feasible.

Your objection should be in writing - type it if at all possible, but it does not need to be in any particular format. Make your points as clearly as possible and of course be accurate to the best of your knowledge. We go over relevant points later in this section.

Submit your objection to the LPA and distribute it to the councillors on the planning committee considering the application. Also, send it, with a press release, to the media.

An important issue to bear in mind when writing an objection is that frequently the planning officer, who is possibly not a specialist regarding landfill, will be summarising the objections in a report. (It varies from LPA to LPA as to whether objection letters are attached to reports). Make it easy for the officer! By having such things as summary points you can guide the officer towards emphasising the points you want emphasised. Also, campaigners should be aware that it is not unknown for officers to distort or oversimplify objections in their reports. It is vital that the objector

[21] Royal Town Planning Institute, 26 Portland Place, London W1N 4BE. Telephone: 0171 636 9107.

gets a copy of the report before the committee date (it should be available five working days beforehand), and makes sure that Members are aware of any inaccuracies.

Submit the objection in the name of your campaign group. This may be useful later on, in order to acquire legal standing at a later date should you wish to challenge the planning decision (for example, if you want to challenge the planning decision in the courts).

And while this is happening, remember to continue gathering public support!

Note that if the application is approved by the LPA, you have no right of appeal. The applicant may appeal though, and this is discussed in the next section.

The Planning Decision

Section 8 describes the planning system and the background policies to which the LPA must refer in order to make its decision in relation to a planning application.

The specific criteria and ***material considerations*** which the LPA is able to consider in coming to its decision about the proposal are covered in national planning policy guidance issued by the Government. Much of this is in the form of Planning Policy Guidance Notes, known as PPGs (to which we refer throughout these sections). There is no "set list" of material considerations: PPG 1 states that "*material considerations... must be related to the purpose of planning legislation, which is to regulate the development and use of land in the public interest... Much will depend on the nature of the application under consideration, the relevant policies in the development plan and the surrounding circumstances.*"[22] So there is pretty broad scope for raising issues.

Definitely regarded as "material" would be relevant legislation and guidance, statutory development plans, landscaping, access, impact on a neighbourhood, loss of amenity and sustainable development. "Prematurity" can also be a factor if one can show that granting approval would prejudice a later decision, eg a (large) landfill site might pre-empt consideration of alternatives if a local waste management strategy is still being formulated currently.

Impacts on personal matters such as property values or views from a home are not material considerations, nevertheless the level of opposition from the public can have an effect. Try to channel such concerns into related but material considerations such as worries about increased traffic. Do think about *all* the potential problems, but then try to express them in terms of the public interest, rather than private interest.

Because pollution issues are regarded as the province of the Environment Agency rather than as planning matters, arguing about pollution can be tricky (and this is further discussed later). Where possible use the terms of the PPGs and planning Acts such as "sustainable development", "amenity" or "residential amenity" which will help justify your arguments as material.

These material considerations should form the basis of your objection. In relation to landfill proposals, the key considerations include:

- **consistency of the proposal with the Development Plan *(see below)***
- **consistency with EU and national waste management policies**
- **consistency with local and national transport policy**
- **status of the proposed site (particularly if designated for habitat or building conservation)**
- **planning history of the site**
- **necessity for the landfill**
- **land stability and safety**
- **landscaping, restoration and aftercare**
- **pollution control issues beyond those which are the responsibility of the Agency.**

Some of these are discussed in *PPG 1* and *Planning Policy Guidance Note 23 "Planning and Pollution Control"* (PPG 23) and its draft part revision[23].

[If you are in Wales, please read the box later in this section - Wales has its own set of PPGs, but it is still worth reading PPG 23.]

Gathering information for your objection

- **Obtain a copy of the application**

[22] DoE (February 1997). Planning Policy Guidance: General Policy and Principles (PPG 1).

[23] At the time of going to print, it has not yet been decided whether a completely revised version of PPG 23 will be produced, or whether the Revision will be published as an additional document. Call the DoE for the latest information.

Applications for planning permission must be advertised in the local newspaper and by means of notices at the site of the proposed landfill.

You have a right to see planning applications and supporting documentation (such as the environmental statement) free of charge at the local library and to obtain copies for a reasonable charge (reflecting photocopying and distribution costs only). You may be able to obtain free copies from other sources such as friendly councillors.

Usually the application will need to be accompanied by an Environmental Statement (ES), depending on its likelihood of causing environmental damage. The ES will contain much of the information that the LPA requires in order to make a judgement about the acceptability of the proposal in terms of environmental impact. For more information on dealing with the ES, see Section 13.

- **Obtain the views of the consultees**

The LPA is legally obliged to consult with a number of organisations (*statutory consultees*) and to take their views into account. Statutory consultees are bodies with some official responsibility for the environment. The friendly ones can be used as a means of sharing resources and information. If any of the statutory consultees have not been consulted, you can demand that the application cannot be considered until full consultation has taken place. This may buy you a little time.

Statutory consultees include:

- **The District Council -** The District Council must advise a Parish Council of any development of land in its area if it has expressed an interest in being kept informed.

- **The Environment Agency** - to examine the risks of landfill gas and leachate posed by the proposed site and to determine the risk of pollution to surface or groundwater.

- **The Highway Authority/Department of Transport** - if the proposal will affect roads by increased traffic movements. The Highway Authority for trunk roads is the Secretary of State for Transport in England, and the Secretary of State for Wales in Wales. The Highway Authorities for other roads are the County Councils and the unitary authorities. The relevant Highway Authority should be consulted if a planning application includes any alteration to the road network or is likely to result in a material increase in the volume or material change in the character of traffic entering or leaving by road or proposed road or to prejudice the improvement or construction of such a road.

- **Neighbouring planning authorities -** if land in their area may be affected.

- **English Nature or the Countryside Council for Wales** - if it affects a conservation area such as a Site of Special Scientific Interest.

- **The Ministry of Agriculture, Fisheries and Food** - if it causes the loss of agricultural land.

- **The Health and Safety Executive** - to examine the risks posed by sites taking hazardous wastes and to examine the potential effects of an accident on the surrounding area.

- **Any other relevant Government Department** - if it could affect a safeguarded area such as an aerodrome.

Contact each of the consultees and ask for a copy of any representation they are making on the proposal. Whether they have made a representation or not, tell these bodies about your concerns and ask them to answer any particular questions you have. If any consultee expresses reservations about the application but does not clearly state that it opposes it, ask outright whether it supports or objects to the proposal. If they do appear unsure, it may well be worth trying to persuade them to come out against the proposal.

Publicise any concerns contained in their representations or replies. This will add authority to your campaign. If any of the consultees is opposed to the proposal then this greatly increases the strength of your case and will boost your campaign. Make public their opposition, use it on your leaflets and when talking to local residents. If a consultee supports the proposal make sure it gives clear reasons why. If these don't stand up to scrutiny, criticise their stance and provide evidence (for example your objection) to try to convince them to change their stance.

The consultees' representations may help you to identify and find out more about the particular problems of the proposal. They may also help you identify potential allies in fighting the application.

If the LPA fails to consult a statutory consultee, then the application should be rejected, although it is likely to be re-submitted at a later date.

Non-statutory consultees

These are organisations which may be consulted but only at the discretion of the LPA. Often organisations which would have something to say in opposition to a proposed landfill are not aware that a proposal has been made, so make a list of all the local organisations whom you think should know. If the Council is not consulting them, you can:

- write to the Council asking them to consult them
- publish open letters in your local papers warning them and putting your case
- write to or visit them to explain what is happening, put your case and let them know why they should get involved.

- **Obtain copies of the Development Plan**

Development Plans detail the local authorities' planning policies *(see Section 8)*.

- **Find out about the planning history of the site**

The LPA will be able to give you details of the planning history.

- Has there been planning permission granted before for the site and if so, what for?
- Has the site already been designated for a specific purpose other than waste disposal?
- Does the planning history of the site reveal similar proposals that were rejected? If so, find out from the LPA the grounds on which the proposals were rejected.

- **Obtain copies of relevant national planning policy guidance**

You will need to get a copy of PPG 23 and the (as yet still draft) Revision supplement. If you are in Wales, you need a copy of *Planning Guidance (Wales): Planning Policy* (see box above). These may be available in the local library. Again, it may be advisable to view them first and copy only the relevant pages of some.

Go through all the relevant guidance and note any matters that the proposal must comply with. You can then check whether the application clearly demonstrates that the proposal will comply with the guidance. If there is any discrepancy between the guidance and the application, contact the developer or any other relevant body and try to establish why. Some of the enquiries suggested below will help to do this, but it is not an exhaustive list.

Compiling your objection

Your objection should address each of the material considerations in turn *(see above)*, clearly explaining the shortcomings of the proposal in terms of each one and making reference, where appropriate, to:

- completeness of information in the application
- the opinions of the statutory consultees
- the likelihood of the development causing detriment or nuisance
- your own opinion.

Bearing in mind that you have limited time in which to submit your objection, you may wish to prioritise and limit the grounds on which you object in detail, but try to gather as much relevant information as you can to help you develop the arguments.

Planning Policy in Wales

This is a specific note about the status of Planning Policy Guidance Notes, PPGs, in Wales.

There are some references to PPGs in the text, and we have provided a relevant list in Annex 8. For England, a number of PPGs exist, some of which have been or are being updated. Recent PPGs for England do not apply to Wales, even when an earlier version did. For example, the PPG 13 on transport of 1994 which, in England, superseded the 1988 version, did not apply in Wales which meant that the 1988 advice was still relevant in Wales. Since then, a note from the Welsh Office "Planning Guidance (Wales): Planning Policy" (the Welsh Planning Guidance) has been produced (1996). This consolidates into the Welsh context much of the PPGs which were formerly issued jointly with the DOE, but with a few exceptions which are listed in the Welsh Planning Guidance. An example is the appendices of the 1988 PPG 13. (And these may be superseded in the future by WO "Technical Advice Notes".) There is also a WO Technical Advice Note 5 on Nature Conservation and Planning which is relevant.

This also means that PPG 23 on pollution control and planning and PPG 9 on nature conservation have been issued for England only. Our advice though is to
a) call the Welsh Office and check exactly what Circulars, PPGs and Technical Advice Notes might be relevant and current when you begin to campaign, and
b) still refer to PPG 23 and PPG 9. It is always worth comparing the Welsh advisory notes to any relevant English ones - different interpretations may come to light; an issue may be covered in one version but not the other; and you could quote the official English advice if relevant. Remember that much of the law applies to both England and Wales, and the PPGs also cover issues of international law, such as the EC Waste Framework Directive, which are obviously relevant in Wales.

You may want to cover the following 7 areas:

1. Does the application contain all the relevant information ?
2. Does it fit in with the Development Plan ?
3. Are transport implications significant ?
4. Is the site needed ?
5. Will it create unacceptable levels of pollution ?
6. Will it damage wildlife or agricultural sites ?
7. Will it create "nuisance"?

If you have confidence in any other relevant organisation with specialist expertise who are objecting to the proposal, it may be prudent to leave parts of the objection to them, but still summarise their points in your own objection.

The following paragraphs will give you guidance on the kind of information which you could try to collect and include in your objection. Whatever level the objection is pitched at, make sure that you:

- Quote the application reference number and the address of the application site
- Refer to the planning application and the local structure plan
- Limit your comments to the current development proposal
- Base your arguments on known facts and expert advice
- Refer to the concerns of the consultees
- Refer to other evidence or documents
- Concentrate on material considerations
- Explain clearly why the proposal would be harmful
- Make your points brief and concise
- Refer to specific facts and figures
- Type the letter if at all possible and use a clear structure and layout
- Refer to any relevant planning history of the site
- Refer to the Development Plan

1. Does the application contain all the relevant information?

The information that an application must contain is

detailed in the following legislation:

- The Town and Country Planning (General Permitted Development Order) 1995 (SI: 1995/417)

- The Town and Country Planning (General Procedures Order) 1995 (SI: 1995/418)

The first thing to check is whether the application is complete. It must include information on a range of issues, so compare the information required by the legislation with that in the application. If this information has not been provided then you can call for the application to be thrown out on the grounds of insufficient information. It may be re-submitted at a later date, but this will give you more time to develop your arguments and build your campaign. The required information includes:

- the nature of the waste

- the amounts of waste to be treated or disposed of

- access to the site and the timescale of the operations

- an up-to-date and accurate map.

2. The Development Plan

Go through the Development Plans carefully and highlight any contradiction between the plans and the application.

Read all the component plans and ask yourself the following questions:

- Is the Structure Plan adequately reflected in the Local Plan?

- Is the Waste Local Plan in harmony with the Waste Disposal Plan?

- Is the landfill proposal in line with all relevant provisions of the structure plan, Local Plan and, especially, the Waste Local Plan?

When preparing your objections, refer to passages from any of these documents that support your arguments.

There may be weakness in the component plans which you can criticise, for example:

- some of the component plans may not have been written
- the different plans may conflict with each other

- the plans may be of poor quality or out of date.

In these cases, you can call for the planning application to be rejected on the grounds that there is no comprehensive planning strategy for waste disposal in the area. A recent appeal[24] against a failure to decide within the prescribed period an application for planning permission for a waste incinerator in Surrey was dismissed by the Secretary of State for the Environment. The appeal was dismissed because the County Council's overall waste strategy was still to be considered at an Inquiry into the waste local plan. The Secretary of State took the view that the appeal proposal was so significant that to give permission would pre-determine the decisions about the scale and location of development which ought properly to be taken in the development plan context (i.e. it would be premature to give the incinerator the go ahead before the Development Plan had been completed).

Check the Waste Local Plan designation of the land, i.e. is it already designated for waste disposal?

If the proposal is not supported by the development plan, then the developer must demonstrate that there is an overriding need for the site *(see below)*.

3. Transport movements

Planning Policy Guidance Note 13 (PPG 13 - Transport) states that, as a broad guide, the Department of Transport would regard an increase in traffic in the order of 5% as material in most cases, though where the capacity of a road is near to being exceeded, a smaller percentage increase may well be material.

The local authority is required to produce an annual document called *Transport Policies and Programmes (TPP)* which detail the authority's planned transport developments over the following year. Notwithstanding the rather short-term nature of the TPP, you should check that the transport requirements of the proposal is consistent with the TPP.

It is worth asking for a "Transport Impact Assessment"

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[24] Appeal decision APPB3600/A/95/250539 reported at [1996] JPL 1069. As reported in *Wastes Management*, February 1997.

(using PPG 13 as guidance) to be carried out. These are increasingly common and local authorities may use the results to ask for highway improvements as a condition of the planning permission - which may make the development uneconomic.

The movement of waste

The transport of waste to the proposed site, particularly by road, may pose considerable risks to the surrounding area. These risks should be borne in mind when criticising the application.

Waste may be transported in municipal collection vehicles (used mainly for household waste), in tipper lorries or skips (used mainly for commercial and dry industrial waste) or in tankers (containing liquid wastes). The roads serving a landfill site may not be suitable either for the size or the number of lorries. This may cause traffic congestion problems and so lead to delays, increase the risk of accidents with other vehicles or pedestrians, as well as causing damage to the road itself.

The transport of waste may also adversely affect developments along the route (eg residential housing, schools, hospitals) through the noise, smell and dust generated, as well increasing the risk of accidents. Vibration from heavy lorries may also damage nearby property. The noise from reversing bleepers may also be considered unacceptable.

Depending on the types of waste deposited at the site, there may be problems of spillage of waste material en route. This may occur either through day to day operations (eg spillage from the top of an open lorry) or through an accident leading to release of the waste (eg rupturing of a tanker container).

Increased traffic movements in residential areas may also be considered a "nuisance" to residents.

PPG 23 states that waste planning authorities should encourage the movement of waste by rail and water rather than by road *"wherever economically feasible and environmentally beneficial"*.

4. The question of "need" for a landfill site

Your objection should aim to prove that there is no need for the landfill site and promote waste minimisation and recycling.

Planning applicants do not normally have to prove the need for the development or any alternatives except where other material considerations act against the proposal - such as the need to protect designated nature conservation sites. However, proposals for waste management facilities appear to have become something of an exception and are required to prove need.

Paragraph 3.15 of PPG 23 states that:
"Applicants do not normally have to prove the need for their proposed developments, or discuss the merits of alternative sites. However, a number of judicial decisions have established certain categories of development where the duty to consider the existence of alternative sites may arise. The nature of such developments and national or regional need may make the availability, or lack of availability, of alternative sites material to the planning decision."

Doncaster MBC

One such judicial decision is that in relation to the dismissal of an appeal over the refusal by Doncaster Metropolitan Borough Council to grant planning permission for a quarry (sand, gravel and clay extraction) and landfill[25]. Several closed landfill sites were already located in the vicinity and no convincing arguments were put forward as to why these could not be reopened. The Inspector's report recommended dismissing the appeal, concluding that *"that there is insufficient demand for void space at present"* and citing the ***proximity principle,*** ie that waste should be dealt with as close to its source as possible[26].

The Inspector's report made the following comments:

"Over-provision of void space would fail to take account of the principles of sustainable development, and would be harmful in itself",

"The greater the concentration of disposal facilities within one borough, the greater the amount of cross-boundary movements will be [and] overall travel would generally increase"; and

"I do not accept that need for waste disposal sites can only be considered when some harm has to be overcome. Indeed, if the proximity principle were to be compromised by permitting a site for which the

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[25] Planning reference number APP/F4410 /A/95/253135.

[26] The *Proximity Principle* originates in the Waste Framework Directive, and appears in the White Paper, *This Common Inheritance* (1990).

*need was not established**, the lack of need may be harmful in itself**. Furthermore, a lack of need for waste disposal may equate to doubt over the ability to satisfactorily reclaim the site"* (our emphasis).

The inspector summarised:

"I do not consider that the benefits of this proposal in... the ability to satisfy markets for aggregates and waste disposal are sufficient to outweigh the harm which this proposal would do to the policies for sustainable development, particularly in terms of the proximity principle; to the amenity of nearby residents; or to the enjoyment of users of the Doncastrian Way."

Most significantly, the Secretary of State accepted the Inspector's summary in his Decision letter and turned down the appeal.

This establishes three important points in relation to the question of "need":

- Lack of proven need *may be harmful in itself* because excess supply of void space in one area would result in wastes being attracted from elsewhere - ie from over a greater distance - and thereby contravening the *proximity principle*. Therefore, need should be demonstrated in order to overcome that harm.

- Lack of need has implications for the satisfactory restoration of the site, and therefore for the ability of the developers to comply with restoration conditions set out in any planning permission for the quarry that might have been granted.

- If landfill is to be considered an intrinsically harmful activity (due to nuisance, pollution threat etc) - which FOE would insist is self-evident - "need" should be demonstrated in order to overcome that intrinsic harm.

Irrespective of the implications of the Doncaster decision, if the developer advances arguments about "need" in support of the Application, counter-arguments are able to be taken into consideration.

The proximity principle originates in the EC Framework Directive on Waste, placing a duty on planning authorities to establish a network of facilities for waste management which cater for regional needs and ensuring that there is no detriment to the environment.

FOE believes that a new landfill site for municipal wastes cannot be justified if the local authorities have failed to include ambitious recycling provisions which would contribute to the Government's 25% recycling target for household waste, and have failed to consider alternative waste management options *(see Appendix 1)*.

Compare the local recycling rate with the higher levels achieved by some other local authorities (whilst being careful to say that none of these authorities are perfect; again see Appendix 1).

If the waste is coming from a district which has a lower recycling rate than its neighbours, highlight this shortcoming.

Make the following enquiries about waste production and disposal in the area and use the information you have collected, together with background information about waste reduction and recycling, to highlight the lack of proven need for the landfill. If you fail to get a satisfactory responses to your enquiries, then highlight the fact that no proven need has been identified for the proposed landfill.

- **Find out how much waste is produced in you area**

Figures for the waste which is produced, imported into and exported out of a particular area should be contained in the Waste Disposal Plan. However this information may be out of date, so ask the LPA for its most recent figures.

If the developer is claiming that the site is justified on the grounds of projected population growth/employment expansion, check that they have supplied credible data to support the claim.

- **Find out how waste is disposed of in your area**

Ask the Agency how much waste is landfilled, recycled or incinerated. These figures should also be available from the Waste Disposal Plan or recycling plans.

If the proposed tip is to take municipal waste, ask the District Council(s) in the areas where the waste is to come from, and ask if they are planning to reduce the amount of waste they are sending to landfill.

If the area is a net importer of waste, ask the Agency to justify this and state in your objection that this is in contravention of the proximity principle.

- **Find out what type of waste is intended for**

disposal at the site

General information about the types of waste to be accepted will be contained in the planning application or planning permission. More specific information will be contained in the waste disposal licence application.

- **Find out about existing landfill and recycling capacity**

Find out what capacity the existing landfill sites and recycling facilities have in your area and whether these are alternatives to the new site. Remember that you will need to break this down by the type of waste. If the area has sufficient capacity for the amount of waste being produced, then the new site is not needed.

- **Find out where the waste is to come from**

Ask from what areas domestic or commercial waste is coming. If it is industrial, construction or demolition waste then ask from which companies it is coming. (The LPA or the Agency may also be able to provide information on the source of the waste, although the public have no right of access to this information.)

- **Industrial wastes**

If one particular company, or a small number of companies, will be a significant user of this site then you may be able to show that the site would be unnecessary if the companies implemented cleaner technologies which eliminate much of the waste generated by industry.

- **Find out which companies the developer hopes will use the site**

Ask those companies to confirm whether or not they are likely to use the site.

Bear in mind that this approach may be very time consuming and many of the companies you contact will not be very helpful.

5. Pollution control issues

Before you start to work on highlighting the potential of the proposal to cause pollution, it is important to grasp the relationship between the planning application and the waste management licence application. The two systems are designed to be complementary. Both deal with the same problems, preventing damage to the environment, but cover different aspects. The planning stage controls development and the appropriate use of land "in the public interest". That function may well include consideration of pollution. The licensing stage covers the prevention of pollution from activities on the site. The dividing line is not always clear and the Government has issued planning guidance to help resolve the overlap.

Paragraph 1.34 of PPG 23, *Planning and Pollution Control*, states that:

"Planning authorities should work on the assumption that the pollution control regimes will be properly applied and enforced."

and that

"They should not seek to substitute their own judgement [for that of the Regulators]."

This clause is often taken as suggesting that pollution control issues are of no relevance to planning applications. Planning authorities may also be of this view, and it is therefore important to make clear why pollution issues are indeed of relevance:

Paragraph 1.34 also states that:

"Matters which will be relevant to a pollution control authorisation or licence may also be material considerations to be taken into account in planning decisions. The weight to be attached to such matters ***will depend on the scope of the pollution control system in each particular case****."*

When you are discussing pollution issues in your Objection, therefore, try to demonstrate how the pollution does not come under the proper control of the regime operated by regulatory agencies. You can do this by highlighting the less stringent requirements of the Agency's groundwater protection policy in relation to the requirements of the EC Groundwater Directive[27] *(see Section 12)*.

In some circumstances the regulatory regime does not address groundwater contamination as required under the Directive. You can therefore argue that pollution control as required by the Directive is beyond the scope of the Agency and must therefore be considered within the planning system.

In addition, the Appeal Court Judgement in relation to

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[27] Council Directive 80/68/EEC of 17 December 1979 on the Protection of Groundwater Against Pollution Caused by Certain Dangerous Substances. Official Journal L20/43, 26.1.1980.

a planning application for a waste incinerator in Gateshead provided further scope for planning authorities to take pollution control issues into account, by discussing the cumulative impact of different sources of pollution.

The Gateshead judgement

The question of allocating responsibility for pollution issues between the planning authority and the pollution regulators was at the heart of an appeal over the granting of planning permission for a clinical waste incinerator at Gateshead in 1993 (Gateshead Metropolitan Borough Council vs Secretary of State for the Environment and Northumbrian Water plc). The principles established could reasonably be applied equally well to landfills.

The original application was refused by the Local Planning Authority (Gateshead MBC). The subsequent Public Inquiry resulted in the Inspector's recommendation to refuse planning permission on the grounds of concern over the additional pollution impact from the proposed plant where existing levels of pollution were already high. However, the Inspector's recommendation was overruled by the Secretary of State who considered that pollution could be satisfactorily managed (because of the system of Integrated Pollution Control established under the Environmental Protection Act 1990).

Gateshead MBC appealed against the Secretary of State's decision by Judicial Review in the High Court, but the Secretary of State's decision was upheld by the High Court. The final stage was an appeal to the Court of Appeal which also upheld the Secretary of State's decision.

The judgement of the Court of Appeal stated that:

"[T]he extent to which discharges from a proposed plant will necessarily or probably pollute the atmosphere and/or create an unacceptable risk of harm to human beings, animals or other organisms, is a material consideration to be taken into account when deciding to grant planning permission."

This means that the planning authorities must consider the extent to which pollution will be caused, suggesting that an assessment of the impacts is required.

The Court's view was that:

"If it had become clear at the inquiry that some of the discharges were bound to be unacceptable so that a refusal by HMIP to grant an authorisation would be the only proper course, the Secretary of State following his own express policy should have refused planning permission."

This means that, if the only proper course of action for the Environment Agency, in relation to the application for the Waste Disposal Licence, would be to refuse the licence, then *the Planning Authority must also refuse planning permission.* Section 12 explains the circumstances where the Agency should indeed refuse a licence for any landfill that might discharge dangerous substances into any groundwater[28]. By citing the Gateshead Judgement, you can therefore use the arguments in Section 12 about groundwater pollution and the waste management licence application in your objection to the planning application.

The High Court judgement also stressed that, despite the fact that the Secretary of State's decision was upheld in this particular case, the judgement should not be taken as carte blanche for applicants for planning permission to ignore the pollution implications and leave it all to the pollution control regime.

A judgement of the Courts - such as this one - has greater legal standing than PPG 23, which is not law in itself, but guidance.

6. Conservation and agriculture issues

PPG 1 General Policy and Principles (1997) states that *"In accordance with the principles of sustainable development, the best and most versatile agricultural land is a national resource for the future. Considerable weight should be given to protecting such land against development."*

PPG 9 Nature Conservation (1994)[29] gives guidance on conservation and heritage considerations in planning. See also the Friends of the Earth briefing sheet on *Wildlife, Planning and Developments*.

PPG 9 states that "*Nature conservation objectives should be taken into account in all planning activities which affect rural and coastal land use, and in urban areas where there is wildlife of local importance."*

It also states that plans must take account of the *"environmental implications of development - for*

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[28] Substances included in List I of the Groundwater Directive

[29] In Wales, see Technical Advice Note 5 on Nature Conservation and Planning (Welsh Office).

example, the impact on landscape quality, wildlife conservation...".

Local authorities may prepare a "Nature Conservation Strategy" which may inform you about nature conservation issues which affect the proposed site, and may be taken into consideration by the LPA. In Northern Ireland, however, local authorities do not usually take an active approach to nature conservation.

Approach the statutory conservation agencies, DoE, MAFF and other interested groups (particularly the county-based Wildlife Trusts) and ask them whether the proposed site would affect any designated areas. The designations are made under provisions by a number of institutions, and the degree of protection varies. They include:

- Sites of Special Scientific Interest - SSSIs *(English Nature/Countryside Council for Wales - CCW)*. SSSIs include all the following designations:
  National Nature Reserves *(English Nature/CCW)*
  Special Areas of Conservation *(English Nature/CCW)*
  Special Protection Areas *(English Nature/CCW)*
  Ramsar Sites *(English Nature/CCW)*
  Areas of Special Scientific Interest - ASSIs *(Northern Ireland only - DoE)*.

Other designations include:

- National Parks *(National Parks Authority)*
- Heritage Coast *(Countryside Commission/Local Authority)*
- Sites of Importance for Nature Conservation *(Local Authority/County Wildlife Trust)*
- Areas of Outstanding Natural Beauty *(Countryside Commission/Local Authority)*
- Country Parks *(Local Authority)*
- Local Nature Reserves *(Local Authority)*
- Green Belt *(Local Authority)*
- Areas of Archaeological Interest *(Royal Commission on Historic Monuments)*
- National Trust Sites *(National Trust)*
- County Wildlife Sites *(Local Authority)*
- Tree Preservation Order *(Local Authority)*
- Listed Buildings *(National Heritage/Local Authority)*
- Scheduled Ancient Monuments *(English Heritage/CADW)*

If any of these sites are affected by the proposed landfill then ask the relevant organisation:

- If the landfill leaked, or if it polluted surface water with contaminated run-off, would it affect surface water that enters such an area?

- Would it result in less open space for agriculture or recreation?

- What are the landscape and nature conservation implications of the proposal?

- Would the proposal result in the removal of trees or woods that enjoy the protection of a tree preservation order?

- Would the proposal affect agricultural land quality, the quality of nearby habitats, and the capacity for environmental improvement when completed?

7. Nuisance

The potential for the landfill to cause or increase nuisances such as smell, dust and litter, rats, birds and flies should be highlighted in the objection. The developers will attempt to show how these nuisances will be controlled, but you may be able to undermine their assurances if you can find examples of other landfills where the suggested control measures have failed.

If planning permission is granted, drawing attention to nuisances will help to ensure that measures to control nuisances are likely to be included in the conditions. It is important, then, to identify as many potential nuisances as you can.

Section 10

The Local Planning Authority and How to Lobby Them

This section -

- *explains how local authorities work*
- *provides tips on influencing their decisions.*

This section is useful background reading when you're campaigning against the planning permission.

How local authorities work

What may conveniently be referred to in everyday speech as "the Council" could be any one of several different organisations, each with different powers, responsibilities and functions. This section is intended to help clarify the distinction between different kinds of local authority and show how they are supposed to operate.

Council structure

The basic structure of local government differs between different areas. Some areas have one tier of local government - unitary authority - whilst others have two.

Note that planning applicaitons for waste facilities such as incinerators and landfill sites are handled (at least initially) at the County Council level in a two-tier area, and by the unitary authority in a single-tier area.

Unitary Authorities. These areas consist of the Metropolitan District Councils (London, Greater Manchester, Merseyside, South Yorkshire, Tyne and Wear, West Midlands and West Yorkshire) and some other urban councils that have been hived off from County Councils (eg Derby City Council). In these areas there is a single tier of local government.

Confusingly, none of the Metropolitan District Councils are actually called such. These councils are known by a variety of names; there are the London Boroughs (eg the London Borough of Islington), the City Councils (such as Leeds City Council), and the rest are called Metropolitan Borough Councils (such as Solihull MBC). Again, rather confusingly, the name City Council is also used for some examples of a different kind of authority - District Councils *(see below)*.

Non-Unitary Authorities. Outside the unitary authority areas, there are two tiers of local government - County Councils and District Councils, which are separate organisations and have different responsibilities. Some District Councils are known as City Councils (eg Cambridge City Council) and some as Borough Councils (eg Brighton Borough Council). The boundaries of District Councils always fall within the boundaries of a single County Council.

Districts are further sub-divided into parishes, many with their own councils. Whilst these councils have very little formal power, the actual influence varies greatly. Parish councils are not further discussed here.

The structure of individual authorities

Local authorities are organised into a number of departments with all the major decisions being the responsibility of committees of elected councillors.

The day-to-day running of the council is in the hands of salaried staff known as Officers who work in different departments, each of which is headed by a Chief Officer. The departments tend to be either administrative (such as the legal, personnel and Chief Executive's departments) or actual service departments (such as planning and education). The overall head of the council is known as the Chief Executive. The Chief Officers and Chief Executive usually form a management team which ensures effective communications between the departments and develops an overall strategy for the authority.

Council committees

The major decisions of the council, such as decisions on the granting of planning permission, are made by committees of councillors (often called members) who are elected by local residents.

Generally there is a committee for each service department as well as an overall policy committee which deals with the wider issues. These are called standing committees.

The committees can set up sub-committees, working parties or advisory committees to deal with specialised

aspects of policy. These committees may have decision making powers delegated by the main committee but more usually merely make recommendations. Sometimes, decision-making powers are delegated to Officers.

Councillors are appointed to the various committees, with the size, composition and membership of the committee decided at the Annual Meetings. Each committee is served by a clerk from the Chief Executive's department and is advised by Officers from the department to which the committee is attached. The role of Officers is to prepare agenda papers and reports and advise committees, but the final decision rests with the councillors themselves.

Decisions taken by committees are subject to approval by the full Council which can overturn them and refer the matters back to the committee for reconsideration.

Local authorities usually transact business in cycles of meetings. Each of the main committees and the full Council will generally meet once during a cycle which is usually about one to two months long. Informal discussions are likely to take place before a matter reaches an agenda paper for a committee meeting. These may include discussions amongst members of the committee (especially the Chair) and council Officers, and discussions between the councillors representing a particular political party. The Chair of the committee and their deputies - who are usually members of the majority party - tend to have the most power and are usually involved in close discussions with Chief Officers about day to day issues and longer term policies.

The rules by which a council operates are detailed in its *Standing Orders* which are defined and approved by full Council.

How committee decisions evolve

Before a proposal reaches an agenda paper at a committee meeting, there may have already been many stages of informal discussion. This may include pre-committee discussions between members of the committee (especially the chair) and council officers as well as discussions between councillors of a particular party. However the first formal discussion comes at the committee meeting.

In reality, the actual decision about a contentious planning application would be made during these informal discussions between councillors of the majority party which take place outside of the committee meetings. The members of the majority party will agree to use their majority to determine this pre-agreed outcome in Committee. A limited number of opposing votes may be permitted within the majority party if particular councillors feel politically vulnerable on the issue, but the preference of the majority will determine the outcome nonetheless.

Getting information out of local authorities

The *Local Government (Access to Information) Act 1985* gives the public rights to find out about Council business and obtain key documents such as reports, minutes and background papers.

With a few tightly defined exceptions, members of the public now have access to all council committee and council sub-committee meetings as well as to agendas, reports, minutes and background papers. Agendas have to be published in advance and relevant documents made available to the public.

However there remains no definition of what constitutes a "reasonable" fee for copying documents (with some authorities charging £3.50 a sheet for photocopying!). There is also some leeway for what actually constitutes a committee, since there is no public access to a working party or informal groups.

The *Environmental Information Regulations 1992* give the public the right to see environmental information held by the local authority. This includes information relating to monitoring, regulation and activities affecting the state of the environment.

Exceptions to this entitlement include information which is considered commercially confidential, prejudicial to national security or still in the course of completion.

For more information, see the FOE briefing *Using Your Right to Know.*

Lobbying the local authority

The most important decision-makers in relation to a landfill proposal are likely to be those within the local authority who are responsible for determining the outcome of the planning application (the planning department and planning committee). If the facility is intended for municipal waste, then those within the local authority with responsibility for awarding ***waste***

Waste disposal authorities and contracts

If the proposed site is to accept municipal waste and the developer cannot find a local authority to agree a contract to supply waste to the site, then the construction of the site is unlikely to take place. If a landfill site proposal has been particularly unpopular in the area, then it is worth pursuing the option of lobbying the local authority not to use the site. This should not, however, take precedence over campaigning against the planning permission or the licence, but the possibility should be borne in mind.

Even if planning permission is (or has been) granted, it is still worth using many of the same arguments in relation to the disposal contract because:

- you will be dealing with different Councillors and Officers
- continued public support for your campaign may result in increased interest in your arguments within the authority.

If there is a pressing need to award a waste disposal contract and the WDA proposes to award a long-term contract (eg 25 years), you could try to persuade them to award only a short-term (eg. 5 years) contract using existing facilities, pending proper evaluation of alternative waste management options.

disposal contracts (the waste disposal authority - WDA) may also be of potential significance *(see boxes in this section).*

Attempting to influence directly those decision-makers and persuade them that the application should be rejected will be an important aspect of your campaigning.

- **Identify which people will make the decision**

Your overall objectives in attempting to influence the local authority are to:

- convince the councillors on the Planning Committee/WDA that the "cost" (either politically or because of potential pollution) of supporting the application is too high.
- convince the Planning Department Officers that the proposal should be rejected on the grounds of existing planning policy.
- convince the relevant Officers that there is no overriding urgency in awarding a long-term waste disposal contract.

- **Make yourself known to the decision makers**

It is important to be more than just a signature on a piece of paper - however well-reasoned your arguments are. Your influence will be greater if you meet with the decision-makers (and those who influence them) and explain your case. At least try to talk to them on the telephone.

- **Find out which Council Officer(s) will deal with the application/contract**

Specifically identify the Officer(s) handling the application/contract and the Chief Officer with overall responsibility for the department. Each planning application is assigned to a planning Officer (or Officers), who compiles a report on the case for the relevant planning committee, recommending what decision should be made. Obtain details from the council of the relevant council department responsible for handling the planning application and/or waste disposal contract.

- **Find out which Committee will be making the decision.**

Obtain details of the relevant committee that considers the planning application/disposal contract. Identify the councillors who sit on these committees (particularly the Chair and the vice-Chair). These are the key individuals to lobby. However, a committee can delegate the decision to a sub-committee or Officers. Find out who is considering the proposal and when.

- **Get as much background info as possible**

This may include agendas, minutes, reports and background papers for both previous and forthcoming

Waste Authorities

The *Waste Collection Authority (WCA)* is normally part of the district level local authority. It is responsible for refuse collection, and also for drawing up recycling plans, and sometimes for ensuring recycling takes place. In different authorities it will be part of different departments - for example, it could sit in environmental health, or technical services.

The *Waste Disposal Authority (WDA)* exists at county level and is responsible for directing disposal of waste to landfill or incineration, and sometimes for some recycling.

In unitary authorities the above two functions may be combined. Sometimes the disposal authority will cover several unitary authorities, especially in large towns. For example, there is a Greater Manchester Waste Disposal Authority, but Greater Manchester comprises several unitary authorities.

Until recently, the above authorities would physically carry out their functions - for example, council employees would actually be doing the refuse collection, or running the landfill site. However, authorities now have to allow the private sector to compete to carry out these functions, under "compulsory competitive tendering". Not all authorities have yet done this. The letting of local authority waste contracts provides a campaigning opportunity *(see box this section).*

The previous local authority set-up can still carry out the functions, but has to be set up as a limited company to do so, and has to compete with private sector companies. These "arms-length companies" set up for waste disposal are known as *Local Authority Waste Disposal Companies* or *LAWDCs*.

At the time of writing there are proposals for new municipal waste strategies, to be drawn up by the Disposal and Collection authorities jointly. These strategies would be "informed" by the development plans for waste. However, this sensible proposal may not be put into effect for some time.

Committee meetings which discuss the proposal. This will give you an indication of the level of support in the Committee and the specific aspects of the proposal which are of particular interest.

Tips on lobbying Councillors and Council Officers

- **Lobby the councillors**

Challenge the councillors to state whether they support or oppose the proposal. This gives you an insight into whether the proposal is likely to be accepted or rejected and enables you to identify sympathetic councillors. This "survey" may also represent a good way of getting media attention.

Identify which wards the key councillors represent and concentrate your efforts at building up support for your campaign in those wards. Try to present your arguments in terms of votes for the councillors, and remember that councillors will be more impressed with the greater personal effort that is required for people to express their views in a letter than simply by signing a petition.

- **Lobby the relevant Officers**

Meet with the decision-makers in the planning department and explain your concerns about the proposal. Also, discuss your case with the relevant scientific Officer in the environmental health department; the planning department will consult with that department on pollution and health issues.

- **Keep councillors and Officers in touch with your campaign**

Throughout the campaign keep the councillors briefed with the progress of the campaign. Be prepared to meet with them to discuss the issues.

- **Use friendly councillors**

Certain councillors may be very sympathetic to the aims of the campaign. This is particularly useful if the councillor is on the relevant Committee considering the proposal/contracts.

Use friendly councillors to bring up points during the consideration of the proposal, but beware that, if those

councillors are within a minority party, their views may be deliberately ignored (irrespective of the merits of those views). Friendly councillors may also be able to give you a great deal of "off the record" insight into the progress of the proposal and the weak points to concentrate on.

A friendly councillor (or MP) can be helpful if you are having difficulties obtaining information from the operators or developers, or even the local authority.

You may find friendly councillors within other committees. Members of the Environmental Health Committee may be helpful and supportive.

- **Beware of becoming associated with one particular political party**

The proposal may become something of a political football. Friends of the Earth would strongly recommend that your group doesn't become associated with one particular party since this may lead to your campaign becoming pigeonholed and marginalised.

- **Exploit forthcoming elections**

Exploit any forthcoming elections as an opportunity to make the proposal an issue. Challenge the candidates to clearly state whether they support or oppose the proposal/contract (and refuse to let them get away with a general non-committal response).

You may be able to use this information as an opportunity for media coverage.

- **Try and identify any contacts between your local authority and the proposed operator or developer**

Whilst it may not be very easy, try and find out if there are any links between the people proposing the site and any councillor (or Officer) that may be championing the proposal. If there is evidence of this it would question the suitability of the councillor or Officer being involved in the decision-making process.

- **Use your MP**

Identify the MP for the area, his/her political affiliation and majority. Keep them in touch with the progress of the campaign.

Challenge the MP to state whether he or she supports or objects to the proposal/contract. The support of your local MP would be very useful for your campaign.

As stated above, a forthcoming election tends to concentrate the minds, and so it may be a particularly fruitful time to extract support from the various candidates. In challenging the candidates, make it clear that you intend to make the results available to the local media.

Your MP may also be able to help your campaign by getting answers to questions you have raised with your local authority, interested bodies or the proposed operator.

Northern Ireland

Although local authorities in Northern Ireland do not have responsibility for planning, it may still be worthwhile lobbying councillors and the local authority to attempt to influence the planning process indirectly. Local authorities are statutory consultees and the Department of the Environment Planning Service must consult the appropriate council before deciding any planning application and must take their views into account. If a council does not agree with the Department's view on a particular application, it can request a deferment so that the application can be discussed in more detail. The Department does not have to alter its recommendation, but if it does not, the Council can refer the application to the Planning Directorate which has the power to overturn the divisional office's recommendation.

Because of the relatively limited scope for influencing the planning process in Northern Ireland, influencing the waste disposal contract is of greater significance than in England/Wales.

Section 11

Who Gives Landfill Sites Licences to Operate?

This section -

- *describes the licences needed to operate a landfill*
- *looks at the procedure for applying for a licence*
- *details the opportunities to object to the licence application*
- *discusses compliance with licence conditions if granted.*

This section is essential reading for the group so that it can understand "the rules of the game" when campaigning against the granting of a licence to operate.

Licensing

A waste management licence (WML) is issued by the Environment Agency (the Agency) and is required for the deposit of "controlled" waste in or on land. Controlled waste is defined within the Environmental Protection Act 1990 (EPA 90) and includes most household, commercial and industrial wastes except agricultural wastes. The licence also prohibits disposal of waste in a manner likely to cause pollution or harm to human health.

The waste licensing system was overhauled in 1994 and the old system of "waste disposal licences" (under the Control of Pollution Act 1974), was replaced by the new regime of "waste management licences" under the EPA 90.

Licences are granted with conditions. These deal with matters such as the type and quantity of waste which can be accepted for landfilling at the site, the pollution prevention and security measures that must be installed, and the monitoring that must be carried out during and after landfilling to check whether leachate or gas is escaping from the site.

This new system is set out in a variety of documents:

- Sections 33-43 of the EPA 90 contain the basic framework of the new rules.

- The Waste Management Licensing Regulations 1994 (SI 1994/1056) (the WML Regulations) contain further detailed rules which expand upon this framework.

- DOE Circular 11/94 (WO 26/94) ("the Circular"), gives a 200-page explanation of the reasoning behind the rules and contains a number of Annexes which look at different aspects in detail, such as how the UK law fits in with European Community law and how "waste" is defined.

- Various Waste Management Papers (WMPs) provide guidance from the Department of the Environment (DoE) to the Agency on the way in which they should exercise their powers. The Agency is obliged to take this guidance into account when deciding upon licence applications. WMPs are therefore significant and form the policy basis upon which Agency decisions are supposed to be made. The most important WMPs in this context are:

  - WMP 4, *Licensing of Waste Management Facilities*

  - WMP 26A, *Landfill Completion* - a technical memorandum providing guidance on assessing the completion of licensed landfill sites;

  - WMP 26B, *Landfill Design, Construction and Operational Practice*

  - WMP 27, *Landfill Gas* - a technical memorandum on the monitoring and control of landfill gas

  - WMP 26E, *Landfill Restoration and Post Closure Management* is due to be published in 1997 and touches on many issues of landfill management.

Various European Community directives must also be considered, particularly:

- Council Directive 75/442/EEC (as amended by 91/156/EEC) on Waste

- Council Directive 80/68/EEC on the protection of groundwater against pollution caused by dangerous substances

There are a few exemptions to the requirement for a waste disposal facility to have a WML. These are set out in the WML Regulations (see paragraphs 16 -18 and Schedule 3 of the Regulations, Annexes 5 and 6 of DOE Circular 11/94, WO 26/94).

In applying for a licence, the applicant is required to set out the basis of the design and explain how it will achieve the proposed standards of construction and operation. The applicant is also required to state what kinds of waste the landfill will be accepting, which helps the Agency to determine the required standards of construction and pollution control. The landfill should be inspected regularly by the Agency to ensure compliance with the proposed standards of construction and operation.

The licence holder remains responsible for pollution and nuisance from the landfill until that licence is surrendered back to the Agency and a "Certificate of Completion" has been issued in return. A completion certificate will not be issued unless the landfill has reached the stage whereby the Agency is satisfied that it no longer represents a significant risk of pollution or nuisance. This requirement only came into force in 1995 and it remains to be seen how long operators will have to retain their licences.

The Agency are obliged to consult certain organisations ("statutory consultees") such as the LPA and the Health and Safety Executive and take their views into account when considering a licence application. From the campaigning point of view, however, the licensing system offers much less opportunity for the public to influence the process than the planning application. The Agency are not even legally obliged to consult the public over the process, although the views of the public and certain other organisations (non-statutory consultees) may be taken into account at the Agency's discretion.

If the Agency turns down the licence application, the applicant can appeal to the Secretary of State. The public have no right of appeal against the Agency's decision on a licence application.

Despite these shortcomings, the attention of enthusiastic campaigners is likely to encourage the Agency officials to examine and assess licence applications with due diligence and perhaps be more critical than they otherwise might. The conditions that are attached to the licence are likely to be more stringent if the Agency are aware that there is close public scrutiny of the application.

The licence application

Applications for a licence are made to the local office of the Agency. Copies of applications and supporting documentation are held on a public register (the Register) at the local offices of the Agency.

In considering the application, the Agency can ask for whatever information it sees fit. WMP 4 sets out the basic information which should appear in an application.

Some of this information will be contained in the applicant's Working Plan which may already have been used in connection with the planning application. The Working Plan must also be submitted with the licence application.

The licence application should cover:

- the location of the landfill site, including any existing or known prospective development within 250 metres of the boundary of the site
- the location of the boundaries, specifying what identifies them on the ground
- details of the ownership of the site, including the applicant's own interest in the land (for example, a lease)
- a copy of the planning permission or other documentation showing that the use of the site is lawful
- details of any relevant convictions, the technical competence and the financial provision to be made by the applicant
- an assessment of the physical environment of the site, which might include its topography, meteorology, geology, and hydrogeology, the quality of air, surface water, groundwater and soil
- detailed descriptions of the way activities are to be carried out, covering matters such as:
  - detailed drawings and descriptions of the engineering development of the site and the infrastructure, such as
  - engineering work to control the pollution of surface water and groundwater by leachate, or by the spillage of wastes and other

materials

- gates, fencing, roads, entrances, hardstanding, garaging, the wheel cleaner, the weigh-bridge, offices, laboratory facilities, drains, interceptors, water, power and communications routes and other infrastructure
- pollution control equipment and litter screens
- bunds (large earth barriers), liners and capping
- facilities for the measurement, monitoring and management of landfill gas
- opening and operating hours
- details of the amounts and types of waste to be landfilled
- monitoring procedures

- record keeping
- staffing levels, qualifications and experience of staff, and management systems
- plans for restoring the site and the way in which this ties in with any restoration conditions in the planning permission.

How the application is dealt with

Applications are generally assigned to an individual officer of the Agency who is responsible for assessing the information provided in the application and drafting the licence conditions. The draft licence is offered for consultation with certain statutory organisations with a potential interest *(see below)*.

Applications should be determined within four months unless the applicant and the Agency agree that this period should be extended. If no decision is made within this period, the applicant can appeal to the Secretary of State for the Environment/Welsh Secretary.

Where planning permission is required for a licensable activity, the licence cannot be granted before planning permission is obtained. To save time, however, the licence application may be submitted earlier, and then granted as soon as planning permission is obtained.

Unlike applications for certain other types of licence (eg, planning permission or major industry authorisations) the applicant is not obliged to advertise the fact of the licence application in the local press or to notify people who may be affected.

Consultation on the draft licence

If the Agency is willing to issue a licence it must send a copy of the proposed conditions to the statutory consultees including:

- the Waste Disposal Authority (WDA) and Waste Collection Authority (WCA)within the local authority
- the Local Planning Authority within the local authority
- Health and Safety Executive
- English Nature or the Countryside Council for Wales if the proposed landfill is situated in a specially protected area.

The Agency may also contact the British Geological Survey as a non-statutory consultee.

The consultees have 21 days in which to make representations to the Agency, and their opinion must be taken into consideration in finalising the terms of the licence. Details of any representations from the statutory consultees must be entered on the public register (see Section 7).

The Agency should also consult neighbouring local authorities if the site crosses their boundaries or is close to the boundary.

The Agency will also discuss the proposed conditions with the applicant.

Before the formation of the Agency, licences were issued by the Waste Regulatory Authorities (WRAs) - part of the local authorities. Being accountable to local democracy, the WRAs were perhaps more ready to involve the public in the consultation process than the Agency might turn out to be. It remains to be seen what opportunities the Agency might offer for public involvement, or what weight they might afford to public objections, now that the process is no longer conducted within the local authority. Early indications are that they are at least prepared to accept representations from the public although still no formal mechanism exists for this. WMP 4 states that:

"the WRA must reflect the interests of the public and of the statutory consultees."

It is reasonable to assume that this requirement has passed to the Agency along with the responsibility to determine WML applications.

Refusal

An application for a licence cannot be refused by the Agency except on one or more of the following grounds:

- Rejection is necessary to prevent pollution of the environment or harm to human health.
- The applicant is not a "fit and proper person" (as defined by the Environmental Protection Act) to hold a waste management licence *(see box Section12)*.
- *If the landfill did not need planning permission,* the licence can be rejected on the grounds that the landfill will cause "serious detriment" to the amenities of the locality ("serious disamenity"). This could include factors such as increased traffic, smells, visual offensiveness and other matters usually dealt with at the planning stage

Copies of a refusal will be placed on the Register.

Appeals

An applicant for a licence, or a licence holder, or a proposed transferee can appeal against decisions by the Agency, such as the conditions it puts in the licence or the suspension of a licence (see Section 43 of the EPA 90, paragraphs 6-9 of the WML Regulations and Annex 10 of DOE Circular 11/94, WO 26/94). The appeal is made to the Secretary of State who will appoint an inspector (usually from the Planning Inspectorate) to deal with it.

The public has no right of appeal against the granting of a waste management licence.

Appeals must normally be brought within six months of the decision date or deadline for decision.

A copy of the notice of appeal will be placed on the Register together with the necessary accompanying documentation (defined in the WML Regulations).

An inspector can decide an appeal by taking written representations or by holding a hearing. The hearing can be held wholly or partly in private, at the discretion of the inspector.

A copy of the inspector's decision and any supporting documentation will be placed on the Register.

Pollution control

Where leachate is likely to enter "controlled water" (ie groundwater and almost all surface waters including coastal waters) then a discharge consent (a permit authorising disposal to water) is required from the Environment Agency, unless the discharge is controlled within the terms of the WML. In future, it is likely that discharges from landfills will usually be controlled through WMLs rather than through discharge consents. Either way, limits will be placed on the quantities and concentrations of individual chemicals permitted in the liquid. In the absence of a discharge consent or appropriate provisions within the WML, it is an offence under Section 85 of the *Water Resources Act 1991* (WRA 91) to allow polluting material to enter controlled waters.

Where discharges of leachate or surface drainage are made to sewers, a consent is required from the local water company as the sewerage undertakers. If the discharge contains List I substances[30], then prior consent must also be granted by the Agency.

If the Agency decides that an application for discharge consent may have "an appreciable effect", then notice of the application has to be published in a local newspaper, and also the London Gazette[31]. Representations must be lodged within six weeks, and the Agency has a duty to consider any submissions. If there is likely to be "no appreciable effect", then the Agency may waive the requirements to advertise, but as with WML applications, your attention to the process is likely to uphold standards and it is always worth making inquiries about any possible applications for discharge consents.

If a WML was surrendered by the operator prior to April 1st, 1995, when the licensing provisions of the EPA 90 came into force, then responsibility for monitoring the site for pollution lies with the Environmental Health department of the local authority.

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[30] Substances included in List I of the Groundwater Directive.

[31] Schedule 10, Water Resources Act 1991.

Section 12

Campaigning Against the Licence Application

This section -

- *details the grounds for opposing an application for a waste management licence.*

This section is essential reading for when your group compiles its objection to the granting of a licence for the landfill to operate.

The waste management licence (WML) system offers less opportunity for the public to make objections than the planning system. Responding to the licence application is therefore less important than objecting to the planning application. If, however, planning permission is not needed or has already been granted, then the best course of action is to concentrate on the licence application. Further information about licensing is given in the DoE guidance, Waste Management Paper No 4 (WMP 4).

Although the WML will not be officially granted until planning permission has been secured, the WML application can be made at any time. In order to avoid getting caught out, keep in contact with the Agency so that you are sure to be informed as soon as the WML application is made. Licence applications should be determined within 21 days if planning permission has been obtained. This period will include all the consultation that the Agency undertakes.

As discussed in the previous section, if planning permission is granted, the WML can only be turned down on the following grounds:

- If rejection is necessary to prevent pollution of the environment or harm to human health.

- If the applicant is not a "fit and proper person" to hold a waste management licence *(see box on following page)*.

- *If the landfill did not need planning permission,* the licence can be rejected on the grounds that the landfill will cause "serious detriment" to the amenities of the locality ("serious disamenity"). This could include factors such as increased traffic, smells, visual offensiveness and other matters usually dealt with at the planning stage.

Copies of a refusal will be placed on the public register *(see Section 7)*.

Your objective, therefore, is to convince the Agency that refusal is justified on one or other of these grounds, and we suggest how to do this later in this section. Write to the Agency, making a detailed submission which expresses your objection and clearly sets out the grounds upon which you consider the WML application should be turned down. Send a copy to the media together with a press release summarising the main points.

Essential tasks

Obtain a copy of the application
Current licence applications are on the public register held by the Agency. The application (rather than a draft licence) is likely to form the basis of the consultation.

Find out who will make the decision and when
Find out the name of the Environment Agency Officer who will be making the decision.

Get a copy of the Local Planning Authority Officer's Report
This is produced in relation to the planning application and may be available at the time that the licence application is made.

Get a copy of the Environmental Statement (ES)
This may have been submitted in support of the planning application or the licence application or both. The ES will also give you some clues about shortcomings in the licence application.

Obtain the views of interested bodies
Ask the Agency for a full list of those consulted (or being consulted) with regard to the application.

A fit and proper person

The Environmental Protection Act 1990 gives three criteria which must be satisfied for someone to be deemed "fit and proper". (These are explained more fully in WMP 4.)

i) The applicant or "another relevant person" should generally have no previous conviction for a "relevant offence". Relevant offences are listed in regulation 3 of the WML Regulations. It is possible that a relevant conviction at any one of a company's sites will render the operator "unfit and improper" in relation to all of its sites. However a conviction is not an absolute bar and the Agency can decide that the offence was too trivial to merit refusing to give an applicant a licence (See Chapter 3 of WMP 4).

ii) The management of the site must be "in the hands of a technically competent person". The minimum qualifications which will normally be required for site managers at landfill sites are set out in regulation 4 of the WML Regulations. However there are extensive exemptions from the need to hold qualifications (see regulation 5 of the WML Regulations and Chapter 3 of WMP 4).

iii) The applicant must have financial provision "adequate" to discharge the obligations arising from the licence. The applicant must show that it has and will in the future continue to have the funds to, for example, buy and install the necessary pollution prevention and monitoring equipment and pay for repairs and adequate staffing. Some form of insurance to pay for pollution remediation measures will also be required.

The Agency has been undertaking negotiations with the landfill industry over what may constitute "adequate financial provision". The Agency Head of Waste stated to the Environmental Services Association annual conference (October, 1996) that:

"Aftercare cannot be allowed to go wrong. Therefore, before deciding an applicant is a "fit and proper person" to operate a landfill site, the Agency will expect the applicant to offer real financial security to ensure its proposed aftercare plans are followed through. Until a final understanding is reached with the waste industry regarding what is acceptable, the Agency will only license applicants who offer to secure aftercare plans by means of an Escrow account or a Rolling Bond."

"By expecting a high level of financial security, the Agency aims to ensure that even if a company should go bankrupt, aftercare obligations will be met in full."

A Rolling Bond can operate as a kind of "insurance policy" with a three-way agreement between the waste business which pays premiums to a bondsman who contracts to pay the Environment Agency if certain conditions are not met. The company would have to regularly renew the bond, which would have to pay out to the Agency if the company failed to renew, or reneged on its undertakings in regard to the maintenance and aftercare of the waste site.

Questioning the application

WMP 4 sets out the information required when an application for a waste management licence is made.

The Agency is in the process of producing universal guidance to applicants and its staff on the completion of WML applications. When it becomes available, this guidance can also be used to check the Application for completeness. In the meantime, each area office of the Agency will have its own guidelines for licence applications.

If the contents of the licence application are not consistent with the planning application or any environmental statement that has been carried out, then demand that it be rejected.

If the accompanying site investigation does not properly address *all* relevant issues, then you can call for the application to be rejected since it does not provide adequate information to form the basis for a decision.

If no environmental assessment was carried out before

planning permission was granted, call for one to be carried out now. The Agency has considerable discretion in being able to call for one in support of the licence application.

Proving that there will be pollution of the environment

The EC Groundwater Directive

The European legislation which is crucial to the protection of groundwater is the 1980 Groundwater Directive[32]. This directive contains provisions which are required to be complied with by designated "competent authorities", in this case the Environment Agency.

The directive was designed to protect groundwater from pollution by two lists of substances and groups of substances, known as List I and List II substances. List I contains substances such as organohalogens, mercury and cadmium which are regarded as particularly toxic, persistent and bioaccumulative. List II lists substances regarded as less hazardous but still in need of control such as lead, copper, nickel and "biocides not on List I".

The directive requires Member States to:

"take the necessary steps to prevent the introduction into groundwater of substances in List I" (Article 3); and to

"prohibit all direct discharges of substances in List I (Article 4).

With respect to List I substances, Member States *"shall subject to prior investigation any disposal or tipping for the purpose of disposal of these substances which might lead to indirect discharge[33]. In the light of that investigation Member States shall prohibit such activity or shall grant authorisation provided that all the technical precautions necessary to prevent such discharges are observed" (*Article 4.1*).*

Note that the Directive does not allow for any evaluation of the costs and benefits of the technical measures necessary to prevent indirect discharge.

So Member States are required to prohibit any activity (such as landfill) that might lead to the introduction of List I substances into any groundwater except where the quantities are *"so small as to obviate any ... deterioration in the quality of the receiving groundwater"* (Article 2(b)).

The Environment Agency's Groundwater Policy states that the Agency has some objections to landfill (depending on location and pollution potential of the waste) over aquifers used for abstraction, but that it will not object beyond a certain range from a water source or where an aquifer is not used as a water source. However, the Agency also states that *"engineering measures for wastes which could produce leachate of significant polluting potential* ***must provide for total containment*** *and disposal of leachate in an approved management scheme"* (our emphasis). But the DOE's Waste Management Paper 26B states that *"as all materials have a finite permeability, some finite seepage is inevitable"*, so total containment is not a realistic concept.

Friends of the Earth is of the opinion that the UK provisions fall some way short of the requirements of the Directive:

- The national groundwater policy draws a distinction between aquifers with and without current abstractions and confers less protection on aquifers without current abstraction. The Directive makes no such distinction.

- The Directive exempts discharges containing "small" concentrations of List I or II substances. The UK Government defines this as applying to discharges which are so small *"as to enable unimpaired use of the water from the aquifer without necessitating any significant change in its treatment"*[34]. This interpretation is not necessarily correct, and the precise implications should be queried in any particular case.

- DOE Circular 11/94 (WO 26/94), also excludes pollution occurring as a result of historic landfilling activities from the scope of

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[32] Council Directive 80/68/EEC of 17 December 1979 on the Protection of Groundwater Against Pollution Caused by Certain Dangerous Substances.

[33] "Indirect discharge" is the entry of List I or II substances into groundwater after percolation though the ground or subsoil.

[34] DOE Circular 4/82 (WO 7/82).

the Directive, although Member States may subject such discharges to the Groundwater Directive (Article 21).

Notwithstanding the shortcomings in the implementation of the Groundwater Directive, Member States are required to comply with European law irrespective of whether those provisions have been incorporated into domestic law. In Friends of the Earth's opinion the intent of the Groundwater Directive is to protect groundwater from dangerous substances and should therefore require the Environment Agency to refuse a licence for a landfill above any aquifer if that landfill may produce leachate which contains List I substances.

So it is worth trying to:

- show that the proposed site is above or close to an aquifer
- show that the landfill may produce leachate containing List I substances in quantities that may cause deterioration of groundwater
- show that leachate will inevitably leak from the site.

List II substances[35]

In respect of List II substances (the less harmful substances), Member States are required to:

"limit the introduction into groundwater of List II substances so as to avoid pollution...".

"Pollution" is defined as:

"the discharge by man, directly or indirectly, of substances or energy into groundwater, the results of which are such as to endanger human health or water supplies, harm living resources and the aquatic ecosystem or interfere with other legitimate uses of water" (Article 1(2)(d)).

Member States may grant consent if all the technical precautions for preventing pollution are observed (Article 5(1)).

The requirements of this provision therefore depend on the quantity of List II substances leaching that constitutes pollution within the terms of the Directive.

Examine the company's record

If you can show that a critical examination of the history of the proposed operator reveals a lack of experience or expertise in landfilling, problems at other sites run by the same operator, convictions for waste disposal offences and a less than open attitude towards the public - all this will enable you to raise the question of the applicant's competence.

You are unlikely to get very much information from the company itself about pollution from its sites - however, asking for this information and publicising its inadequate replies will enable you to expose the company as failing to come clean about its record. Naturally this will make an even better story if you have already found out the relevant information from the regulatory authorities. Nevertheless, ask the company (its name and address will be on the licence application) for the name, address and national grid reference of all the landfill sites that it currently operates or has ever operated. Make it clear that this includes closed sites and sites that they no longer own. They do not have to give you this information, but a refusal or a misleading reply will add weight to your case against their being "fit and proper people" to manage a landfill *(see below)*.

To identify the company's other sites, it may be worth undertaking an electronic search on the *Sitefile Digest* [36] . This is a private database of waste management licences held by a consultancy called Aspinwall & Co. Be aware that they will charge you before they do a database search for you.

When you have identified the company's other sites, you can check with the regulatory authorities for pollution problems at any or all of those sites.

Ask the relevant regional Environment Agency offices for information on groundwater or surface water pollution, gas production and migration or any other problems at open sites and closed sites operated by the applicant. This information is held on the public register, and although it may involve a lot of work, it can be a very useful exercise.

Highlight any sign of pollution at other sites run by the

[35] Substances included in List II of the Groundwater Directive (80/68/EEC) (which are regarded as less harmful than those in List I).

[36] Aspinwall and Company Ltd, Shrewsbury. Tel 01939 261144.

proposed operator.

Ask the company to confirm that all its sites are monitored

Including monitoring for surface water pollution, groundwater pollution and landfill gas production and migration. Ask whether it is willing to make the monitoring information available to the public.

If the company fails to reply, refuses to tell you about its other sites or refuses, in principle, to make available monitoring information, you can accuse it of failing to come clean about its pollution record. State that if the company has nothing to hide it should release the information.

Ask if there are any problems at their other sites

This would include any indication of surface water pollution, groundwater pollution or landfill gas generation and migration at any of the sites they currently operate or have operated in the past.

If they say that there have been pollution problems then highlight these as a reason why the company should not be allowed to operate the proposed landfill.

If they refuse to reply, then suggest it is failing to come clean about its pollution record and state that if the company has nothing to hide it should release the information.

If the operator has agreed in principle to allow you to examine its monitoring results for all other sites (not just the best ones!), you may wish to take them up on this.

Make sure that you choose which site(s) you research, that you are seeing the raw monitoring information and not merely a sanitised version and that you can photocopy and take away any relevant results.

Highlight the numbers of leaking landfills

Use the information on the problems caused by landfilling. In particular, refer to the surveys that have been carried out which demonstrate the poor record of landfills at controlling problems with gas and leachate (Annexes 3 and 4). The statistics on problems with gas control measures and liners can be used to question the extent to which the operator will be able to prevent pollution from the site.

Proving the operator is not "fit and proper"

The Environmental Protection Act gives three criteria which must be satisfied for someone to be deemed "fit and proper" *(see box earlier in this section)*. These are explained more fully in WMP 4.

By carrying out a few enquiries, you may well be able to establish that the proposed operator is not a "fit and proper person" to hold a waste management licence. Check the licence application for the details listed below, and if they are missing or not required in the application, ask the company directly. If the application fails to address any matters which are required in the application, this will serve as grounds for the application to be rejected.

Convictions for Relevant Offences

The Waste Management Licensing Regulations 1994, give a list of the offences which are considered to be relevant and therefore to disqualify somebody from being a fit and proper person to hold a waste management licence.

Has the company, any of its staff, or any other company that its officials are or have been, associated with, been convicted of any offences regarding the carriage, treatment or disposal of waste in any part of the UK in the last five years?

If the company or any officials within it have been convicted of waste management offences which aren't "relevant" your case will still be strengthened and you will be able to claim the moral high ground.

If the company fails to reply to your enquiries, then again highlight the secrecy and state that if the company has nothing to hide it should release the information.

If the company claims that it has not been convicted of any waste management offences then check with the Agency for the areas in which it operates sites.

Technical competence

Different types of landfills require different levels of training. Check that the operator has met the training requirements laid out in the Waste Management Licensing Regulations. Check also if there are arrangements in place for occasions when the named person is absent from the site.

Using the consultees

Contact the statutory and non-statutory consultees *(see Section 8)* and ask if they are making a representation to the Agency with regard to the application. If so, ask for a copy of their representation.

If the Agency has not contacted any one of the statutory consultees, or if any of those bodies consider that they have had insufficient time to respond, then demand that the proposal is turned down because of insufficient consultation.

In addition, express your concerns and ask them to answer particular queries you have with regard to the proposal (whether they have made a representation or not). Highlight any concerns contained in any of their representations or replies. The views expressed in these representations may help you focus on the particular problems of the proposal and may identify potential allies in fighting the application.

If you feel that a body is expressing reservations about the application but is not clearly stating that it is against the application then ask the body directly whether they support or object to the present application.

Stringent conditions

If the Agency decides to grant the licence, they will include a number of conditions with which the operators must comply. The purpose of the conditions is to ensure that the site is operated to a standard which the Agency feels will adequately protect the environment. Highlighting the matters which you feel should be the subject of conditions may help the Agency to come to the conclusion that the application has failed adequately to address environmental concerns. The Agency may then feel justified in rejecting the application.

Even if the Agency approves the application, the matters that you have raised may translate into onerous conditions which will improve environmental standards. Also, breaches of these conditions could form the basis for a future campaign to get the site closed. Stringent conditions may even deter some operators from going ahead with the proposal.

Despite their importance, you must be careful about how you press for licence conditions. If you request outright that certain conditions are necessary, your critics may deliberately misinterpret this, saying that you *approve* of the site as long as the conditions are met.

The following is a list of matters which you should highlight, drawing attention to any failure in the licence application to address them:

Leachate Control Devices - Check whether leachate control measures are included.

Leachate Monitoring - Check whether the licence specifies the number and location of boreholes, the frequency of testing, the range of parameters to be tested, and an assurance that the results will be given to the Agency.

Gas Control Measures - Check whether an active pumping system will be installed to collect and utilise the gas.

Gas Monitoring - Check whether the application specifies the number and location of boreholes, the frequency of testing, the range of parameters to be tested, and an assurance that the results will be given to the Agency and Environmental Health Department/DoE.

Nuisance Control Measures - Check whether detailed measures are included for dealing with smell, dust and litter, rats, birds and flies.

Timing of Operations - Check whether there is a clear timetable for development of certain infrastructure items, such as wheel washes, not covered by the planning conditions.

Limits of the Landfill - Check whether the area and boundaries of the site are clearly defined, as well as the height and depth to which waste can be filled.

Working Hours - Check whether the working hours are specified so as to limit disturbance early in the morning, in the evening and at weekends.

Fencing and Gates - Check whether there is to be effective fencing and gates around the site, and that the licence contains a clear obligation to mend broken fences within a specified time.

Daily Cover - Check whether details of the type and amount of daily cover are specified.

Types of Waste - Check whether there is a clear list of the types of waste that can and cannot be accepted at the site. If hazardous waste is to be accepted, make

sure that the types that are acceptable and unacceptable are clearly defined.

Cap - Check whether details of the type of cap are specified.

Final Cover Material - Check whether details of the type and depth of the cover material are included.

Quality Assurance - Check whether the liner, pollution control devices, cap and final cover are to be installed by qualified personnel and are tested for leaks prior to tipping. Check whether an independent engineer is to be appointed to supervise the installation of the liner.

Records - Check whether the application unambiguously states that the operator undertakes to keep accurate records of the amounts, types and source of waste accepted and the time and place of disposal.

Liability - Check whether the application unambiguously states that the operator undertakes to clean up any pollution from the site, whether the pollution was caused by legal activities or not.

Site Closure - Check whether the application unambiguously states that the operator accepts the need for the site to be closed down pending a full investigation if there is an indication of pollution from the site. Make sure that the application identifies what constitutes water pollution or significant landfill gas production.

Section 13

The Environmental Statement

This section -

- *details when an Environmental Statement is needed*
- *describes what an Environmental Statement is*
- *suggests how to examine an Environmental Statement.*

This section is essential reading when your group is examining an Environmental Statement provided to the local planning authority (LPA) or Environment Agency by the developer/operator of the proposed landfill site.

A formal statement of the environmental impact of the proposed development may be submitted along with the planning application or, sometimes, with the waste management licence (WML) application, or both. The purpose of the Environmental Statement (ES) is to help the Local Planning Authority (LPA) and/or the Environment Agency to decide whether the proposal is acceptable on environmental grounds. An "environmental impact assessment" (EIA) is the process by which information for the ES is collected. You will need to consider the ES in your criticisms of the planning application and the WML application.

If the ES is in any way critical of the proposal, then it can be used to help your campaign. If it supports the proposal in any way, then the ES itself will need to be scrutinised. If a proper ES has not been required by the LPA or the Agency, then calling for one to be submitted will be an important way of putting pressure on the developers and operators and drawing attention to the lack of scrutiny by the regulators.

In the case of planning applications, an ES is not required for all landfills, the requirement depends on the seriousness of the likely environmental impact. Schedule 1 of the Town and Country Planning (Assessment of Environmental Effects) Regulations 1988[37] (the Regulations referred to in this section) lists the kinds of proposals that will definitely need an ES. Modern landfills are usually large enough to make an ES clearly necessary. Schedule 2 of the 1988 Regulations lists the kind of proposals where the LPA is allowed discretion in requiring one.

The Regulations are based on the requirements of the EC Directive on environmental assessment 85/337/EEC[38]. Development on all sites designated under the Habitats Directive 92/43/EEC will also require an ES[39].

Planning authorities must notify the developer within three weeks if they consider the application subject to an EIA.

In the case of WML applications, the Agency has considerable discretion in requiring an ES and in the kind of information that it must contain.

Scope of the EIA

The most fundamental problems with the EIA system are that the information that must be included is very scantily defined (in Schedule 3 of the Regulations) and that the assessment is usually carried out by the developer themselves, or someone acting on the developer's behalf (such as an environmental consultancy). Thus there is a tendency for "unhelpful" information to be omitted, but it is possible for campaigners to request involvement in "scoping" the EIA[40].

- Write to the LPA before an application is submitted and demand to be included in the scoping discussions

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[37] Statutory Instrument 1988/1199

[38] 85/337/EEC on the assessment of the effects of certain public and private projects on the environment (OJ L175/40, 5.7.1985)

[39] 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (OJ L206/7, 22.7.92)

[40] This will become more formalised in 1999, under the revised environmental impact assessment Directive, 97/11/EEC (Official Journal L73/5, 14.3.97).

- Write a list of key issues, which could include a much wider range of issues than are normally selected - alternatives to landfill, the issue of pollutants and their effects on health, water and agricultural land, the chances of liners failing, indirect and incremental effects such as additional air pollution. Use examples where possible to show why particular issues should be covered.

- Try to force the developer to pay for an "independent" consultant chosen by the LPA. This should result in a much better quality ES.

- Make your request in writing, and justify your involvement eg that your campaign group represents x number of local concerned residents.

There have been cases where ESs have been "doctored" by the developer by removing or changing unhelpful statements. Sometimes the ES is commissioned directly by the LPA or the Secretary of State, in which case it is likely to be more impartial.

The Assessment

When carrying out the EIA, the developer may consult those bodies with legal responsibility for environmental protection. These might include:

- Environment Agency
- Countryside Commission
- English Nature or Countryside Council for Wales
- District Council
- Highways Authority.

These bodies must provide any relevant information in their possession but they are not required to undertake new work on behalf of the developer.

The full results must be made available to the public. The statement should be available for inspection locally and at reasonable hours, and the developer is required to publish a notice in the local paper indicating where and when the ES may be inspected. The developer should also make a reasonable number of copies of the statement available for sale to members of the public at a reasonable charge (reflecting printing and distribution costs only).

How to deal with the Environmental Statement

● Find out whether an ES has been submitted for the proposal

Contact the planning authority and the Agency. In the case of the LPA, be clear that you mean an ES as specified in the Town and Country (Assessment of Environmental Effects) Regulations 1988, since a developer or planning authority may have produced an assessment of the likely environmental impact in the documentation supporting the application, but something less rigorous than is required by the regulations.

● If an ES has not been submitted, call for one

Find out whether the proposal absolutely requires an ES (Schedule 1 of the Regulations) or it is merely discretionary (Schedule 2).

Proposals for landfills taking "special waste" are Schedule 1, while all other proposed landfills are Schedule 2 projects. "Special waste" is a legal definition of certain particularly dangerous or difficult types of waste[41].

If it is a Schedule 1 project then demand that an EIA is performed. A planning decision without one would be against EC and UK law.

If it is a Schedule 2 site (and meets the Government's criteria) then state that an EIA is recommended in both EC and UK law and should be performed to fully assess the possible risks to both human health and the wider environment before any planning decision is made.

Even if the proposal is schedule 2 and doesn't meet the Government's criteria, then state that an EIA is recommended in EC law and should be performed before any planning decision to fully assess the possible risks to both human health and the wider environment.

Calling for an EIA allows you to adopt the moral high ground by calling for independent scrutiny of the proposal and also gives you more time to organise your campaign. Since the proposed developer is footing the

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[41] See *DOE Circular 6/96 (WO21/96) - Special Waste Regulations 1996* for more details.

bill for the EIA then it is important to remember that this EIA will cost them time and money.

- **If the planning authority refuses to require an EIA, appeal to the Secretary of State**

If the planning authority refuses to require that the developer submits an ES, ask the Secretary of State to intervene and require an ES.

- **Call for a high quality ES**

If the LPA or Agency agrees to an ES being required, then call for it to be carried out by a reputable firm of environmental consultants. Call for the full results to be made available to the public and the cost to be paid for by the developer.

However, given the variable standard of many ESs, it is important not to commit yourself in advance to the findings of the assessment.

- **If an ES has been submitted, get a copy**

You may also be able to get a free copy from the developer or the District Council.

If you have any difficulty getting the ES complain to the media and your local MP about the public being kept in the dark about the proposals.

- **Criticising the ES**

If the ES is generally supportive of the proposal, you will need to identify if it has failed to properly address the environmental issues. You need to examine it for thoroughness, quality and objectivity. Alternatively, even if the ES is not generally supportive, the developer or operator may refer to isolated helpful passages. The following enquiries will help you to challenge the ES if and where it appears to support the proposal.

- **Find out the general background of the EIA**

The first step is to get a feel for how professional a job the EIA is likely to be. Find out who commissioned the EIA. Was it the developer, the LPA or the Secretary of State? Find out who carried it out. Was it the developer or an environmental consultant? If it was commissioned or carried out by the developer there is obvious potential for a conflict of interest, which you can highlight.

Find out whether the proposed developer or environmental consultancy is a member of any relevant trade body or association. If they are not, then this casts doubt on their credibility to carry out an EIA.

- **Critically examine the overall contents of the ES**

Use the following check-list to examine the ES:

- Does it include all the information required by the Regulations?
- Does it clearly identify and provide references for all the sources of information?
- Are there any areas which are not covered at all by the ES or which are not covered in sufficient detail?
- Does it look critically at the proposed sources of the waste to be landfilled at the site, and at alternative ways of dealing with it?
- Does it acknowledge the many questions that remain about site design and management (such as the long term stability of liners, uncertainty about the generation and migration of leachate and landfill gas etc)?

If any of these issues have not been adequately addressed, state that the failure of the EIA to look at all aspects of the proposal, in context, severely limits its usefulness.

The planning authority can call for additional information to be supplied by the developer if it feels that an environmental statement contains insufficient detail to form the basis for a decision. Demand that the planning authority does so on the basis of the weaknesses you have identified.

On the other hand, some developers/operators try to blind the regulators with science, submitting huge, highly technical statements. If this happens, call for another ES to be required that is more easily understood.

If the EIA was carried out by environmental consultants, ask the consultants whether the published report is an unedited version of their findings. Similarly, ask the developer/operator whether the published report was an unedited version of the findings. If the report was edited, demand to see the full unedited version. State that the ES was "censored", calling its impartiality into question.

Ask the developer/operator or consultant who carried

out the EIA whether they consulted all of the Statutory Consultees to the planning and licensing process. If the views of any of these bodies was not considered, state that the lack of consultation severely limits the value of the ES.

If any of these bodies made representations, obtain a copy and check that their comments were adequately reflected in the ES. If they were not, highlight the biased and misleading nature of the final report.

If you are unhappy with the quality or thoroughness of the ES or if you feel that it is biased, call on the planning authority to demand that a second EIA be carried out. Again, however, it is important not to commit yourself in advance to the findings of a second ES in case it still fails to address the shortcomings in the first.

- **Computer simulations**

Increasing use is being made of computer simulation models (such as "LANDSIM") which are intended to demonstrate the likely rate of leachate migration and pollution potential from a proposed site. Despite the fact that these programmes are apparently highly sophisticated and the findings are often taken as unchallengeable, these models can be manipulated to a great extent to support whatever outcome is desired by the user.

Models are dependent upon the numerous assumptions that are made about conditions in the landfill such as waste composition, quality of construction, hydrological characteristics of the site, and permeation rates. The model will inevitably use simplified data which may fail to represent reality properly. Some models will never reflect reality because of fundamental flaws in the programmes themselves.

Certainly, the mathematics of these models will appear incomprehensible to the layperson and most people are understandably reluctant to challenge the findings because they do not feel that they have the necessary expertise. There may, however, be opportunities for you to usefully criticize the findings of the model even without being a mathematical genius.

Firstly, check that it has been verified by peer review. If the results are to be taken seriously, the model will have to have been examined for its accuracy by professionals. The ES should make clear exactly what model has been used. If it has not been verified, you can state that the findings are of no value.

Secondly, check all the assumptions that have been made. Assumptions may be clearly listed, or they may be disguised in the numbers that are fed into the model to represent flow rates, volumes, permeation rates etc. If at all possible, check that they are realistic. Don't be afraid to query aspects of the model. Ask about all the details of the model that seem to differ from what you know of the real proposal.

Thirdly, check for mistakes. With a limited amount of mathematical expertise, you can check to see whether they have managed to put the decimal point in the wrong place here and there. This does happen, and will of course distort the results hugely.

Section 14

Conclusions and Case Histories

This section -

- *gives concluding remarks*
- *highlights two examples of successful landfill campaigns.*

This section is useful reading before starting to campaign or when it is feeling like an uphill battle.

Many local communities have campaigned against applications for landfill sites and won. It is important to remember this.

At the outset it may seem that you have a mountain to climb and that the cards are stacked against you. But you have real advantages. You are local people and your local councillors have to listen to you. You have also got the moral high ground. We shouldn't be dumping resources in the ground, that is simply robbing our children of future resources and storing up pollution problems for them.

Hopefully this manual will help arm you with the information you need to win the arguments and not feel like the "experts" or "authorities" know best. But as the following two case studies reveal, you will also need to motivate local people to oppose the landfill and with enough political pressure

Good luck in your campaigning.

The Red Moss Campaign - Bolton FOE (by Dennis Watson)

Red Moss is an area of ancient wetland near Horwich in Greater Manchester, part of which is designated as a Site of Special Scientific Interest (SSSI) by English Nature. Unfortunately, the site was also designated as a "strategic waste disposal site" under the Bolton Unitary Development Plan. The successful campaign by Bolton FOE to save Red Moss demonstrates the importance of involving local people.

The owners of the land - Bolton Metropolitan Borough Council (BMBC) - had been undergoing negotiations with UK Waste Ltd over the development of 87 hectares of the site as a dump for 8 million cubic metres of waste over 10.5 years. The proposed dump - a *landraise* a mile long and a hundred feet high - would have completely covered and destroyed the SSSI.

BMBC stood to gain £2 million per year in waste management licence fees in relation to the development.

The negotiations were not publicised before the planning application had been submitted. Bolton FOE heard of the plans through their interest in the BMBC Unitary Development Plan. Their first move was to arrange a distribution of 10,000 leaflets throughout the town of Horwich and call a public meeting to inform local people about the proposal. Bolton FOE asked for letters of protest against "this act of environmental vandalism" to be sent to the Council and to the Secretary of State for the Environment. Local residents organised themselves into the "Red Moss Action Group".

Early in 1995, the Secretary of State wrote to BMBC requiring the Council to amend its Development Plan to take account of the ecological status of Red Moss. The Action Group thought that they had effectively won.

However, negotiations continued between the Department of the Environment (DoE) and BMBC to the effect that a proposal for development would be considered if the need for the site and the benefits could be shown to outweigh the nature conservation value of the site. The fight was on again.

In November 1995, UK Waste submitted their application for planning permission. Bolton FOE and RMAG submitted formal objections, including an analysis of the long- term implications for groundwater pollution. The NRA expressed similar reservations, particularly in view of the presence of a minor aquifer under the site, whilst English Nature concentrated on the inevitable destruction of the SSSI.

On the 5th of November, BMBC called a public meeting in Horwich to explain the proposal. The meeting was attended by around 600 local residents who left the Council in no doubt about the strength of

local opposition to the proposal.

Extensive publicity and consultation over the proposal was carried out. Opposition was expressed by the local MP, the opposition parliamentary candidate, the Town Council and Borough Council ward members. 1,700 letters of representation and a petition bearing 10,000 signatures were submitted in relation to the Application.

In recent years, increased weight has been attached to environmental and conservation matters within national and local planning policies. Furthermore, there has been a growing national concern over waste issues, with disposal to land being seen as an option only of last resort. In light of this, and the level of objection to the loss of the SSSI from the Council's advisors and the general public, the Council's Officers considered that the value of the site had not been shown to outweigh the value of the SSSI (and was therefore not in accordance with the new clause in the Development Plan).

On October 24th, 1996, the planning application was presented by the Officers to the Council's Planning Control Sub-Committee with a recommendation to refuse. This recommendation was accepted.

The applicant had exactly six months toApril 24th, 1997, consider their right of appeal against the Council's decision. That time has just expired and Red Moss has been saved!

Magheramorne Quarry - Larne FOE (by Sharron Morrow)

This was very much a joint campaign with Islandmagee and District Conservation Society (IDCS), who had been involved in opposing a planning application 8 years previously when Blue Circle withdrew prior to public inquiry.

In Autumn 1993 IDCS called a meeting to discuss the rumour that Blue Circle were planning to use Magheramorne Quarry as a landfill site. These 25 people, including myself as co-ordinator of Larne FOE, were representatives of local organisations, some professional, others just interested citizens. IDCS continued to co-ordinate meetings, people came and went, but a core committee of 11 evolved and many aspects of campaigning were discussed.

In these early months we were groping in the dark on everything.

The campaign fell into three phases:

1. The PR phase: Autumn 1993 - March 1995

The main topics of meetings at this time were:

- The hydro-geology of the area
- Fundraising
- Publicity

September 1994. We picketed Blue Circle's exhibition of their plans and distributed leaflets telling the real facts. My presentation at the FOE Local Groups Conference gave me a contact, Rachel Jamieson in Devon, who had fought a landfill campaign.

December 1994. Planning application lodged.

January 1995. Environmental statement (ES) published. £75. Now we had some idea of what we were up against.

We all worked on a letter writing campaign to object to the planning application. Many versions of sample letters were handed to friends, family, acquaintances, colleagues, organisations, anybody who could write. The campaign committee paid for the postage. In fact the planning department was swamped and cried for mercy. They received 2,500 letters of objection - the highest figure ever and this ensured that the issue would go to a public inquiry. This was an unprecedented effort which was so successful. It provided a real focus for us and drew in the community.

Thousands of leaflets were printed with a simple message to local people alerting them of the situation. All the houses, approximately 500, on the main transport route were visited in the depths of winter.

2. Preparation of evidence: March 1995 - April 1996

Our committee meetings by now had become weekly and continued so for 2 years!

Larne FOE had received £2,800 from the FOE Local Group Development Fund. This allowed us to employ an experienced campaigner, John Woods, to help write our evidence for the inquiry. FOE/John Woods took on 7 topics from the 14 in the Environmental Statement.

By now many articles on waste management, references, legislation, planning regulations had been accumulated by Larne FOE and IDCS. The committee divided into sub-groups, people followed their own particular expertise or developed expertise they didn't know they had.

Sub-groups were formed to deal with each of the following areas:

- Co-ordination, secretarial and lobbying
- Fundraising
- Technical matters
- PR and press work
- Economic development and tourism
- Planning and statutory matters
- Larne Borough Council liaison .

With great trepidation we also employed a firm of consultants who helped with the other topics in the ES, and later a solicitor with an environmental bent. As time went on, and with hindsight, we could probably have found our own experts for less money.

May 1995. Chris Baines, a well respected environmentalist had been contacted and showed sympathy to our case. So much so that he came to NI to address a meeting. 400 people attended! It was a great success and it gave us a well needed morale boost.

John Woods was doing all the hard work so freeing me to write press articles, organise stunts and fundraise. The FOE group consisting of 12 people ran jumble sales, bric-a-brac sales, tombolas, a coffee morning and a flag day (using wheelie bins and several staff from FOE's national office in London). We were involved in two auctions, one dance and one ladies' luncheon for 100. By now we were all experienced fundraisers and exhibition organisers.

3. The Public Inquiry: November 1995 - June 1996

November 14th, 1995. Inquiry postponed until April 30th. It eventually ran from April 30th to June 12th. A decision from DoE is expected early in 1997, but to date no announcement has been made.

It is still a hot political issue. Because of the campaign, many people have become involved, including an MEP and we believe that issues are still under discussion in the background. Also, because of the new waste strategy being written, the issue of "prematurity" is under discussion and we are hopeful that this will affect attitudes to current waste disposal proposals.

Lessons learned

Personpower helps - one person or a small group cannot do everything.

Make time for everyone, make them feel involved. It may pay off later for personpower or support.

Speak to other campaigners regardless of the topic. They may just have experience, instinct, contacts, ideas and inspiration - all very useful.

Try anything and don't be intimidated! Things can snowball and have unexpected outcomes. You really can't anticipate and plan absolutely everything. Our campaign took nearly three years to get to the end of the public inquiry and things are still happening. If you are seen to be making an effort, people will come to you with useful information or help or advice. You may get leaked documents even, exposing details that may change the course of history!

Also remember that while a campaign is going on, any delays to a go-ahead for a landfill may often be advantageous since policy or law may change in the meantime, affecting the eventual outcome. So get stuck in.

Everything brought to your attention is worthy of consideration. For instance, some of our committee members used their own time to advise, coach and encourage the residents who were giving evidence at the public inquiry. We saved ourselves £2,500 in solicitors' fees by doing so.

Don't worry about expenses - eg. thousands of leaflets printed for publicity or 600 stamps for letter writing campaign. We did the work and then worried about the fundraising. If you believe in your campaign, that conviction will come across to everyone and who wants a landfill anyway? Ways will be found to raise the money.

But double your estimate for costs!

The campaign cost £85,000. Larne Borough Council gave £36,000. We are still raising the shortfall of only £7,000.

Critical factors

Publicity and gaining public support.

It is important to have a committee which gels.

The letters of objection need to be specific and in line with the main points of the campaign.

Timing of media coverage of certain topics. As the campaign evolves, the weight of topics changes. For example, at the opening of the inquiry, FOE built a wall of oil drums to represent the weekly amount of leachate that would be released into the loch. This had a great psychological impact on people as leachate was already flavour of the month and people were aware of the issue. But our oil drums made a visual picture that left an unforgettable image of the problem in people's minds.

Annex 1

The Arguments

During the course of your campaign, you will inevitably find yourself in situations where you are expected to make your case against the proposal, and to counter the arguments that the proponents will offer against your concerns. Such situations might include public meetings, press interviews, and discussions with councillors and Council Officers. Whilst many of the following points will have been made in the preceding Sections of this guide, you may find it useful to have the following arguments and counter arguments brought together here under a single heading.

The proponents will argue...

"The site will be well-engineered to prevent pollution"

The pollution control mechanisms which are built into the landfill are the impermeable liner and cap, the leachate collection system (LCS), the gas collection system (GCS), and the leachate treatment system (which may be purpose-built or may just be the local sewage treatment works). Each of these are discussed in the accompanying technical briefings on landfill construction, liners and gas.

Confidence in the quality of engineering depends on the standard of quality assurance in construction and proven performance record of the pollution control mechanisms that are being depended on. There are problems with both of these criteria.

Possible time constraints, cost-cutting and the reluctance of workers to report damage to liners can mean that faulty seams and serious leaks could go undetected. It only takes one serious leak to cause serious pollution problems. Electrostatic leak detection systems are available, but have not often been used to date because of cost. High standards of construction can only be guaranteed by the more or less permanent presence on-site of an independent inspector reporting to the Agency. The Agency do not have the financial or human resources to undertake such close on-going supervision.

The long-term performance and reliability of liners of all types is very uncertain. Clay liners are subject to desiccation and cracking, and synthetic liners are susceptible to chemical attack and brittle fracture with ageing. All liners are susceptible to penetration by tree roots and rodents. Synthetic liners have only been in existence since the 1950s and their long-term performance characteristics are therefore unknown.

Impermeable caps, consisting of layers of lining material, clay and soil, are susceptible to damage as the surface of the completed landfill becomes disrupted by the uneven settlement and compaction of waste over time. Settlement is still a highly unpredictable process.

LCSs consist of systems of perforated pipes which lie at the base of the landfill and allow leachate to flow under gravity to a central collection point for treatment. The perforations in the pipework can become blocked, causing leachate to collect at the surface of the liner, inevitably resulting in eventual leakage.

GCSs are systems of perforated pipes which are laid throughout the body of the waste and channel gas upwards to the surface. The pipework is susceptible to damage by settlement of waste.

Sewage treatment works are unsuitable for dealing with toxic chemical wastes like leachate. Toxic substances may kill the micro-organisms that the treatment processes depend on, and persistent pollutants like heavy metals are simply not dealt with, ending up in the sludge and receiving waters.

"It will be subject to regulatory controls"

Landfills are regulated prior to construction through the planning process, the waste management licensing process and the discharge consenting process, and subsequently through water pollution control legislation and the enforcement of planning and licensing conditions. These are explained in Section 11.

There are several situations where a landfill proposal can escape the requirement to obtain planning permission, meaning that the development is not subject to any public scrutiny or assessment of its

potential to cause nuisance. Even where planning permission is required, the planning authorities do not necessarily have to account for the views of the statutory consultees.

Planning authorities do not necessarily have the time, expertise or inclination to subject proposals to close scrutiny.

Environmental assessment is unlikely to identify serious problems with the development because of the limited detail which is required and the opportunities for the developer to influence the results of the assessment.

The waste management licensing system has no statutory provisions for public scrutiny. The standards of operation and pollution control which are sanctioned by the licensing system are likely to be far less stringent than the standards that might be tolerated by the public who live nearby the site.

The licensing system is further loaded in favour of the applicant because the applicant has a right of appeal against refusal of a license, whereas the public have no right of appeal against the granting of a licence.

Once the site is operating, the Agency does not have adequate resources to undertake sufficient inspections to ensure that operating conditions are complied with. If a breach of conditions is suspected, the risk of incurring the costs of compensation to the operators acts as a disincentive for the Agency to enforce those conditions.

In relation to the discharge of leachate and effluent, the value of the regulatory controls is dependent on the standard of environmental protection which they attempt to maintain. That standard is inevitably compromised by considerations of the perceived need and economic value of the landfill.

The ability of the Agency to force measures to prevent pollution of the environment through, for example, a leaking liner, may be compromised by the requirement to carry out cost-benefit analysis of taking action (Section 39, Environment Act 1995). Once detected, damage to a landfill liner or leachate collection system can rarely be "economically" repaired.

The requirements of the Agency's groundwater protection policy offers less protection to groundwater than is required by the EC Groundwater Directive.

"The site will be fully restored"

Whatever the standard, restoration is no compensation for the disturbance incurred during the lifetime of the landfill.

The site will remain contaminated indefinitely, and there is a risk that subsidence and ground disturbance will cause waste to come to the surface.

Once contaminated, groundwater will remain so practically indefinitely.

Plant and animal communities will take many decades - or longer - to re-establish.

Section 6 details these arguments more fully.

"It is a necessary waste disposal facility"

The necessity for any landfill site depends entirely on the lengths to which the waste producers are prepared to go to manage their wastes differently. A great deal of commercial and industrial waste could be avoided through waste minimisation techniques and clean technology *(see Appendix 1)*. The main barriers to their implementation are simply lack of awareness of the alternatives, and the lack of appreciation of the potential financial benefits.

The proportion of waste in the UK which is managed through re-use, recycling and composting falls a long way short of what has been achieved in the USA and elsewhere in Europe.

"It will create jobs"

Landfill creates very few jobs compared to the alternative waste management options of recycling and composting[42]. This applies to mixed municipal wastes as well as specific waste streams. In general, the number of jobs created increases with the degree of processing; landfill involves virtually no processing compared to the alternatives.

A study of the employment implications of municipal waste management in New York City showed that landfills created 40 - 60 jobs per million tonnes of waste, whilst mixed solid waste composting created 200 - 300 jobs and recycling facilities created 400 - 590 jobs per million tonnes.

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[42] Friends of the Earth (1994). *Working Future? Jobs and the Environment.* FOE Discussion Paper.

Furthermore, waste minimisation techniques in industry improve efficiency and competitiveness. As Bill Clinton said about reductions in chemical emissions in the USA:

" *„since the Community Right to Know Act has been on the books reported reduction in toxic emissions are about 43 per cent for the whole country. Now that's a law worth passing ... This has kept millions of pounds of chemicals out of our lives. It's helped people to stay healthy and live longer....it's also helped to spur innovation to help businesses work smarter and cleaner and become more profitable, not less profitable.*"

Annex 2

Landfill Gas

Virtually all landfill sites have the potential to generate significant quantities of gases which can be explosive, asphyxiating or toxic. The main gases are methane and carbon dioxide, with trace quantities of other organic compounds - the characteristic mixture being called landfill gas, which may present a major hazard for several decades. Landfill gas problems have only come to the fore in the last 15 years or so, due largely to developments in modern waste collection and landfill practices. Over 1000 sites have been identified in England and Wales as needing controls. This Annex describes the circumstances under which landfill gas is generated and released, the environmental problems associated with it, and the various control measures which are taken and efforts to utilize it as an alternative energy source.

Gas generation

Landfill gas is the product of the anaerobic decomposition of organic material in wastes and leachate by micro-organisms. "Anaerobic" refers to those processes which occur in the absence of oxygen. Significant quantities of landfill gas will therefore be generated only after much of the available oxygen within the landfill has been consumed. This may take from a few weeks to several months, but once anaerobic conditions have been established, gas production is likely to continue for a considerable number of years. Thirty years is a commonly suggested figure, but the duration will depend on the specific conditions at any particular site. Gas production could theoretically continue for a hundred years or more under the right circumstances.

The most significant factors influencing the duration of gas production are temperature, moisture content and, most fundamentally, the nature of the waste itself. Household and some commercial wastes, for instance, contain a high proportion of "putrescible" food wastes which have a high potential for methane production. On the other hand, relatively inert materials such as demolition wastes or quarry wastes are unlikely to generate much gas. It should be noted, however, that materials such as wood and paper, although frequently classified as "inert", are organic in nature and have been responsible for producing high levels of gas at sites where gas production has not been expected.

A recent phenomenon

Buried wastes have always produced gas to some extent, but landfill construction and waste disposal habits have changed dramatically in the last 20 years. It is as a result of these changes that we are presented with the problems that we have today. The tendency for people to live in flats and houses without gardens has meant that relatively little putrescible domestic waste is disposed of in garden compost heaps. In addition, fewer households have open coal fires which provided an alternative method of disposal. As a result, domestic refuse now has a far higher potential for methane generation. Since responsibility for municipal waste disposal passed to the English county authorities in 1974, the landfill sites themselves are now far larger and therefore have a far greater capacity for methane production.

The problem is exacerbated by the need for new landfills to have impermeable liners and caps in order to keep water out and prevent liquids within the site from polluting the soils and groundwater. The caps act to prevent gas escaping freely, thereby allowing gas to build up in large quantities and encouraging it out through the sides of the landfill under its own pressure.

Gas composition

The principal components of landfill gas are methane and carbon dioxide (CO_2) in approximately equal volume, with around 2% by volume nitrogen and a wide variety of other minor components such as volatile organics at trace level[43]. Most of the problems associated with landfill gas are linked with its ability to migrate underground for considerable distances away from the landfill site and subsequently to collect in confined spaces such as residential housing and service ducts. New landfills are therefore usually required to be sited at least 250 metres from the nearest buildings.

Methane is an invisible, odourless gas which is *explosive* at concentrations between 5 and 15 percent

[43] An analysis of typical landfill gas is given in Appendix A of Waste Management Paper 27, *Landfill Gas* (DoE, 1991).

in air. Being lighter than air, methane will tend to rise and can accumulate in enclosed spaces. There have been examples where properties have been destroyed as a result of methane accumulating and being ignited by, for instance, sparking electrical switches. It is primarily this danger which has prompted tighter regulation and control of landfill gas.

Methane in the atmosphere is also a powerful *greenhouse gas*. Like CO_2, it is capable of trapping heat from the sun and thereby contributing to climate change. Although CO_2 makes the greatest overall contribution to climate change (because there is so much of it), molecule for molecule, methane is in fact 25 times more powerful a greenhouse gas than CO_2 over a 100-year time span. It has been estimated that methane emissions are responsible for 20% of the current increase in mean global temperatures and landfill sites are thought to be responsible for 15% of overall global methane emissions (and 45% of total UK emissions[44]). Methane from landfill sites therefore accounts for 3% of the current increase in mean global temperatures.

Methane escaping from landfill sites will react with other pollutants in strong sunlight to produce ground-level ozone and thereby contributing to *photochemical smogs*.

Vegetation dieback around landfill sites can result from the effect of air being excluded from around the root zone by escaping methane. This effect can create large areas of dead trees and barren soil which, apart from the aesthetic loss, can accelerate erosion of the soil covering the landfill. Water which subsequently enters the landfill may then contribute to leachate problems, and buried wastes can be exposed at the surface.

Carbon dioxide is a colourless and odourless gas and has a normal concentration of about 0.03 % in air. It can cause asphyxiation if it displaces oxygen and at concentrations greater than 10% causes severe breathing difficulty, convulsions, headache and collapse. At concentrations greater than 25%, collapse is quickly followed by death from asphyxiation. Being heavier than air, it will present a serious danger if allowed to accumulate in, for instance, cellars or service ducts.

Landfill gas also contains numerous (perhaps a hundred or more) *volatile organic compounds (VOCs)* at trace level. The range and quantity of these compounds will depend on the kind of wastes deposited in the landfill and may therefore be greater at sites containing hazardous chemical wastes. Although there is a lack of good research in this area, there is no doubt that many of these compounds are carcinogenic, mutagenic, or in some other way toxic[45].

In addition, odour problems around landfill sites can often be attributed to VOCs and other trace components in gas emissions such as *hydrogen sulphide*, the classic "rotten egg" gas.

In an attempt to control the releases of gas and to eliminate these toxic and odour- producing compounds, the gas may be burned off (*flared*) at the point of extraction *(see below)*. While this may successfully eliminate 80 - 100% of the contaminants, burning may have the unfortunate consequence of converting some of these compounds into even more toxic products. This is particularly relevant in the case of chlorinated organics, which, under the conditions presented by flaring, will act as precursors for the formation of *dioxins*, which are highly toxic.

Gas Migration

Unless it is actively pumped out or allowed to vent freely from the surface, gas will build up within the body of the landfill. At times of falling barometric pressure, gas will expand beyond the extremities of the site, from where it will follow a path of least resistance through porous soils or fissures in surrounding rock or clay. The presence of an impermeable liner around the landfill will prevent lateral gas migration, forcing the gas upwards towards the surface. But as described in Annex 6 on landfill liners, all liners can be expected eventually to degrade and develop substantial leaks.

Landfill gas is thought to be capable of migrating through permeable soils for up to 250 metres. Distances will be even greater through cavities such as mine shafts, sewers, faults in rock strata, road underlay, and even backfill around pipes and cableways. Lateral migration distances are likely to be highest where upward migration is limited by frozen or waterlogged soil at the surface. Gas may also dissolve in leachate or

[44] The Environment Agency (1996). *The Environment in England and Wales - a Snapshot*.

[45] A recent study detected levels of vinyl chloride(a liver carcinogen) several times above the occupational exposure limit at two of seven landfill sites surveyed. Allen, M.R. et al (1997). Environmental Science & Technology **31**, 1054-1061 *(as reported in the ENDS Report, April 1997)*.

groundwater and subsequently be released some distance from the landfill site.

Subsequent gas entry points into buildings may be through cracks, construction joints, sub-surface utility service openings, and almost any other weak spot in the basement wall or building floor.

Gas Control

In order to prevent gas from building up and migrating from a landfill, it should be removed either by passive venting or by being actively pumped from the site. The gas can then either be burned off or, if generated in sufficient quantities, used as an alternative fuel.

Passive gas collection systems rely on natural pressure and convection mechanisms to vent the landfill gas directly to the atmosphere. Shallow gas venting trenches, or gas venting pipes (1 - 2 m diameter) are installed within the landfill and the gas is allowed to escape to the atmosphere. Venting pipes may be equipped with flares to burn off the gas. Failure of passive vents is generally attributed to the fact that there is insufficient pressure on the gas within the landfill to push it to the venting device and out into the atmosphere. An additional problem is that alternating periods of high and low barometric pressure result in atmospheric air entering the landfill when barometric pressure rises.

Active gas collection systems employ a network of perforated pipes (about 4" diameter) buried within the landfill. Gas is drawn into the pipes and removed from the landfill and surrounding soils under a vacuum, with the gas literally being sucked out of the ground. The gas may then be disposed of by flaring or by utilization as a fuel. Active systems are dependent on the correct working of a vacuum pump, and an alarm should be incorporated to warn of failure.

Gas Disposal

Where the methane concentration exceeds 15% the gas will support a flame and can be burned off directly by a flare. Flaring low concentrations of methane requires supplementary fuel (such as natural gas) and this can greatly increase the operating cost of the landfill gas control system. Due to the high concentration of toxic VOCs in gas from landfill sites containing hazardous chemical wastes, gas from these sites may be passed through a carbon filter which will capture most of the trace contaminants.

An Alternative Fuel

The gas can be used as a fuel in various ways such as use in kilns, furnaces and boilers. Active gas collection systems may recover methane at a sufficient rate to make energy recovery feasible. When the methane concentration is greater than about 35%, it may be commercially worthwhile to recover and sell energy through fuelling efficient steam turbines.

Much is currently being made of the potential for reducing our dependence on fossil fuels. It is estimated, for instance, that energy equivalent to 6.5 million tonnes of coal per annum could be produced by incorporating the right technology into current landfill operations.

But this does not mean that landfill is a good thing! Biogas production can be carried out much more efficiently through proper composting and anaerobic digestion schemes, and the problems such as loss of amenity and pollution from leachate remain.

Regulation

Accountability for the proper control of landfill gas is effected from a variety of standpoints:

Waste Regulation. Operators of landfill sites are required to hold waste management licences issued by the Environment Agency. These licences specify the duties of the holder to monitor and control emissions of gas from the site. After the site has closed, the licence cannot be surrendered until the Agency is satisfied that the condition of the land is unlikely to cause a problem, at which point a "Certificate of Completion" is issued.

Health and Safety. The *Health and Safety at Work Act 1974* places a duty of care on every employer to ensure the health, safety and welfare at work of all employees, and to protect the health and safety of the general public in the vicinity of the workplace.

Under the *Occupier's Liability Act 1984*, landowners must ensure that their premises are reasonably safe for visitors - including trespassers.

Under the *Reporting of Injuries, Diseases and Dangerous Occurrences Regulations* 1985, the Health and Safety Executive are required to be informed in the event of a "dangerous occurrence" such as fire, explosion or the escape of flammable gases.

Common Law Liability. Under Common Law, where the release of dangerous substances from one site

causes damage or harm to private property or the individual, the affected party may be able to claim for damages based on contract, negligence, nuisance, or under strict liability rules.

Annex 3

The Scale of the Landfill Gas Problem

This briefing examines two recent surveys and several specific incidents that give some insight into the likely scale of the landfill gas problem in the UK.

1. Harwell Safety Unit's Study of Problems Posed by 100 Landfills

A Government-commissioned study of 100 landfill sites, aimed at establishing the characteristics of *"as broad a cross-section of UK practice as possible"* was carried out by the Environmental Safety Centre, Atomic Energy Authority, Harwell between 1987-8, with the results published in May 1990[46].

Just over 100 landfill sites were studied. The main findings are outlined below.

- Lack of monitoring

"In about a third of sites there was no data regarding gas migration problems"

- Widescale gas migration

"...a third had detected gas migration. Of those observing migration, 10 had detected gas in adjacent properties and 7 had noted effects on vegetation... 11% of sites had known problems but had taken no action."

- Survey underestimates true extent of the problem

Whilst there are approximately 10,000 open and closed landfill sites in England and Wales, the survey only examined 100 sites. However the survey admitted that:

"the results are not taken as strictly representative: for there has been an unavoidable bias towards the larger, newer and better-managed sites".

The study's findings are therefore likely to underestimate the true extent of the problems.

2. HMIP Survey of Gassing Landfill Sites in England and Wales

In 1988 and 1989, Her Majesty's Inspectorate of Pollution contacted all the waste disposal authorities (WDAs), the bodies then responsible for regulating waste disposal, requesting details of gassing sites in their area and an account of the action taken to control the problem at these sites.

The results of this survey, along with earlier work by HMIP, were published in April 1991[47]. The main findings were:

- Over 1000 gassing landfill sites in England and Wales

The report concluded that there were 1006 gassing sites considered to need controls. (However, the report appears to have incorrectly added the sub-totals for the individual WDAs. In fact, the figures given in the report indicate a total of 1040 sites.)

The majority of these sites (59%) were operated by local authorities, but a significant proportion (41%) were privately operated.

- Survey underestimates the true number of gassing sites

The report admitted that it probably underestimated the true extent of the problem and stated that:

"the picture is not complete, both because the returns from WDAs have proved inconsistent and incomplete and because WDAs are continuing to search for, monitor and control gassing sites".

- Over half the gassing sites were closed

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[46] Croft, B. and Campbell, D. (1990). *Characterisation of 100 Landfill Sites.* Paper presented at Harwell Waste Management Symposium. Environmental Safety Centre, AEA Technology, Oxfordshire.

[47] HMIP (1991). *Landfill Gas - A report of the findings of surveys carried out by HMIP to assess the scale of the problem and provide recommendations for further action.*

The report stated that the majority of these sites (59%) were closed.

- Development on or close to many gassing sites

HMIP highlighted the close proximity of many sites to buildings and stated that:

"Distribution of sites in the survey is uneven with the majority being in urban areas where encroachment of development has occurred, in some cases on to the fill itself."

- Developments close to gassing sites are at risk

HMIP expressed concern about the safety of developments on gassing sites in stating that:

"*Current building controls cannot ensure continued maintenance of gas controls to protect buildings.*"

- Report refused to identify the gassing sites

The report failed to identify the location of the 1006 (or 1040) sites but merely gave the number in each WDA area.

- Many regulatory authorities not tackling the problem

HMIP were also concerned that whilst some WDAs seemed to be tackling the problems posed by gassing landfill sites "*others are not addressing the matter with sufficient speed*".

- Tackling gassing landfill sites will cost £200 million

The report estimated that the cost of installing gas management controls at a site varied from £20,000 to £750,000 and estimated an average capital cost of £200,000. Extrapolating this figure just to cover the 1006 (or 1040) gassing sites mentioned in this report suggests an overall cost of over £200 million.

3. Case Histories of Problems From Landfill Gas

There have been a number of cases, both in the UK and the rest of the world, of problems posed by landfill gas production and migration. Six illustrative examples are given below.

Landfill site, Loscoe, Derbyshire

The migration and build up of landfill gas caused a bungalow to explode and made adjacent properties uninhabitable in Loscoe, Derbyshire in March 1986.

The properties were close to a closed landfill site which had accepted inert and domestic waste. There had been signs of gas generation in 1984 when lawns and trees began dying and the soil began to heat up due to the presence of methane-feeding bacteria. Despite the installation of landfill gas control measures, methane levels remained high in these properties.

Landfill site in North Yorkshire

A house located 50 metres from a site that had received domestic and commercial waste was seriously damaged after landfill gas had migrated along a natural fissure in the geology, built up to explosive levels in the house and then ignited. After the explosion, high levels of methane were found in drains in the area.

Offham Quarry landfill, Maidstone, Kent

An environmental consultant's report states that landfill gas from the tip has killed nearby vegetation[48]. Residents claim that the gas has also caused one house to be evacuated and that unpleasant odours affect the village. In January 1992, Kent County Council, the regulatory authority, stated that:

"there have been a number of difficulties arising from the site which are causing landfill gas odours...the frequency of odour problems seem to be increasing."

White's Pit, North Canford, Poole, Dorset

An environmental consultant's report, published in January 1991, reported explosive levels of methane gas were being produced by the tip, operated by Dorset County Council. The report stated:

"Investigations at White's Pit indicate that there may

[48] Planning Application TM/91/1133, Offham Quarry - To extend area of landfill behind the village, a report from the action committee on behalf of the villagers of Offham (October 1991).

be a risk to human life and property."[49]

Atlanta, Georgia, USA

In December 1967, a single story building was destroyed and two people were killed when landfill gas built up in the basement of the building and exploded[50].

Winston-Salem, North Carolina, USA

In 1969, three people were killed and twenty five were injured when landfill gas accumulated in a building close to a closed landfill site and exploded[51].

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[49] Mott MacDonald Environmental Consultants (January 1991). Application for planning permission for a gas control scheme at White's Pit, North Canford, Poole, Dorset.

[50] North West Waste Disposal Officers (November 1991)(USA). Leachate Management Report - Appendices.

[51] As previous ref.

Annex 4

Water Pollution by Landfill Sites in England and Wales

This briefing touches on a number of surveys, reports and specific incidents that give some insight into the scale of the problem of water pollution from landfill sites in the UK.

1. Department of the Environment/ Institute of Geological Sciences Survey

In the early 1970s, the Institute of Geological Sciences (IGS) was commissioned by the Department of the Environment to examine the risks of water pollution by landfill sites in England and Wales.

IGS contacted the 1,332 local authorities (then responsible for waste disposal and regulation) and requested information about the landfill sites in their area. This included details of the location and size of the sites, the period of tipping and the types of waste deposited.

IGS combined these details for each site with information about the particular local geology and assessed the pollution risk posed by each of these landfills to major and minor aquifers (the risk categories were "none", "some" and "serious").

The information was then sent to the River Authorities (the bodies then responsible for protecting the groundwater and surface water) who assessed whether continuing use of the site was acceptable with regard to both surface and groundwater quality.

Preliminary results of the survey, based on a partial analysis of the information provided, were published in 1974[52].

The report stated that only 875 of the 1332 local authorities replied (66%). These replies detailed 2495 landfill sites. 87% of the sites had been assessed by the IGS for risk of groundwater pollution. Only 714 sites (28%) had been assessed by the Rivers Authorities for suitability for future use.

These preliminary results showed that IGS assessed 51 of these 2165 sites as posing a "serious" risk of pollution to minor or major aquifers. The River Authorities regarded 80 of the 714 sites assessed as being unacceptable for future use.

2. Friends of the Earth's Analysis of the DoE/IGS Survey

Although the preliminary report revealed that analysis of the information was far from complete, a final and more complete and detailed report was never subsequently published.

Some years after the completion of the survey, Friends of the Earth (FOE) obtained a copy of the final version of the survey. The survey included information on 3,055 sites and included further details of the assessments of IGS and (where made) by the River Authorities. The information was entered into a database and mapping programme.

- *Nearly half of sites assessed posed risk to groundwater*

FOE analysis revealed that IGS had identified 1,350 (44.2%) of the 3,055 sites as posing either "some" or "serious" risk of pollution of major or minor aquifers (including 59 classified as posing a "serious" risk).

- *Over a third of sites doubtful or unsuitable for tipping*

FOE analysis revealed that only 786 of the 3,055 sites had been assessed by the River Authorities. They considered further tipping to be either unsuitable or doubtful at 211 sites because of the risk of groundwater pollution and at 155 sites because of the risk of surface water pollution. Altogether, further tipping was regarded as being either unsuitable or doubtful at 272

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[52] Gray, DA *et al* (1974). *Review of Groundwater Pollution From Waste Disposal Sites in England and Wales with Provisional Guidelines for Future Site Selection*. Quarterly Journal of Engineering Geology 7, 181-96.

(34.6%) of the 786 sites assessed, because of the risks of surface water and/or groundwater pollution.

However, the survey and analysis gives only a partial insight into the problems posed by landfill sites for a variety of reasons.

- *Lack of information*

A third of local authorities provided no information for the survey, whilst the quality of information provided by the local authorities who did reply was criticised by IGS as being variable.

- *Limited types of sites surveyed*

The survey only looked at sites in operation between 1971 - 1973. The survey did not look at sites closed before 1971 or opened since.

- *Incomplete appraisal*

The Rivers Authority only appraised a quarter of the landfill sites in the survey.

- *Only a desk-top survey*

The assessments were essentially a desk top exercise rather than based on a visit to the site or the examination of monitoring data.

3. Friends of the Earth Survey of the Proximity of Drinking Water Sources to Currently Operating Landfill Sites

Given the risk of groundwater pollution from landfill sites, a proposed EC landfill directive[53] suggested a minimum distance of 3000 metres between a landfill accepting hazardous or domestic waste and a "groundwater protection zone". This provision was subsequently abandoned in later drafts, but nonetheless offers a useful "rule of thumb" when examining the relative distributions of landfill sites and underground water sources.

Over a third of landfills close to underground water sources

In May 1990, Friends of the Earth's analysis revealed that 726 (34%) of the 2122 groundwater sources in England and Wales were less than 3000 metres from landfill sites licensed to accept household or industrial waste.

However the results only give a partial insight into the risks posed by landfill sites to groundwater for a variety of reasons.

- *The survey did not include old sites*

The survey only analysed the risks posed by currently operating sites.

- *The survey did not include sites accepting "inert" waste*

The survey did not cover those sites licensed to accept only so-called "inert" waste, These sites can also, however, generate leachate[54].

- *Leachate migration can exceed 3000m*

Leachate can, depending on the geology, migrate distances greater than 3000 m. For example, in March 1990, Thames Region NRA announced that there was extensive contamination of groundwater underneath a landfill site at Harwell Atomic Energy Authority in Oxfordshire caused by carbon tetrachloride. This solvent had been detected at the Blewbury public supply borehole, operated by Thames Water Utilities plc, located over four kilometres away[55].

Many groundwater sources are not used for drinking water. The survey only covered groundwater sources that were currently being abstracted.

4. Department of the Environment Assessment of Groundwater Quality

A Government commissioned report, published in 1988, stated that:

"Landfill sites are a major threat to groundwater

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[53] The fourth draft of the European Commission's Proposal for a Council Directive on the landfilling of waste (1990).

[54] Westlake, Sayce and Fawcett (1991). *A study of the type and scale of environmental impacts from landfills accepting wastes other than domestic.* Atomic Energy Authority.

[55] NationalRiversAuthority(1990).*NRAdiscovers pollution in South Oxfordshire.* Thames Region Press Release, 22nd March 1990.

quality and a number of cases of pollution attributable to landfill are recorded."

"All water authorities report groundwater pollution problems with landfill sites to a varying degree, and in some cases it is regarded as the most significant threat."

However, the report failed to provide more details of the scale of the problem[56].

5. Natural Environmental Research Council's Memorandum

In 1989, a memorandum was submitted by the Natural Environment Research Council (NERC) to the House of Commons Select Committee on the Environment as part of their inquiry into toxic waste[57]. The memorandum stated that:

"*Leachate from modern landfills contain organic carcinogens and a range of man-made or "xenobiotic" compounds. Although present in low concentrations, the long term effects of continuing to landfill wastes may well lead to a gradual deterioration in regional as well as local groundwater quality which may not be easy to reverse.*"

6. Harwell Safety Unit's Study of Problems Posed by 100 Landfill Sites

A Government commissioned study of landfill sites, aimed at establishing the characteristics of "*as broad a cross-section of UK practice as possible*" was carried out by the Environmental Safety Centre, AEA Technology, Harwell between 1987-8[58]. The results were published in May 1990.

Just over 100 landfill sites were studied. The main findings are outlined below.

- *Lack of monitoring*

The study revealed:

"In roughly a third of sites there was no definitive information on leachate problems."

- *Widescale water pollution*

The study revealed not only widescale water pollution problems, but also little effort to clean-up the pollution. It stated:

"Of those which performed some monitoring, more than half had experienced surface or groundwater contamination, and of these, only half had taken action to control the problem."

- *Problems with dilute and disperse and containment sites*

The study found water pollution by both dilute and disperse landfill sites and containment sites. The study stated:

"Proportionally, most reported problems occurred in dilute and disperse sites. Almost all groundwater contamination incidents were related to dilute and disperse sites, while containment sites had proportionally more surface contamination incidents."

- *Many leaky sites*

Many of the sites did not meet the Government's standards for permeability. The study stated:

"Our conclusion was that at least 45% of sites had adjoining strata of high permeability to leachate (>10^{-2}cm/sec) [0.01 cm/sec][59]. Only 16% of sites were of permeability less than 10^{-6} cm/sec , so very few met the 10^{-7}cm/sec recommended in Waste Management Paper No. 26."

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56 Department of the Environment (1988). *Assessment of Groundwater Pollution*. The Stationery Office.

57 Memorandum from the Natural Environment Research Council to House of Commons Select Committee on the Environment, Second Report, *Toxic Waste* (1989).

58 Croft, B. and Campbell, D. (1990). *Characterisation of 100 Landfill Sites.* Paper presented at Harwell Waste Management Symposium. Environmental Safety Centre, AEA Technology, Oxfordshire.

59 Permeability is expressed as a distance moved per time unit. The smaller the number the more impermeable the strata or liner. One millionth of a centimetre is 10^{-6} cm, one ten millionth of a centimetre is 10^{-7} cm.

"30% had high permeability strata adjacent to waste deposits."

"26% had fissures, faults or workings adjacent to waste deposits."

- *Problems at old and new sites*

The study concluded that the risks posed by landfilling applied to new sites as well as old sites. It stated:

"While more problems were associated with older sites, newer sites tended to be larger and faster filling, creating a high potential for problems if not effectively managed."

- *Survey underestimated true extent of the problem*

Unfortunately, the survey only examined just over 100 unnamed) landfill sites. However the report stated that:

"The 100 sites accepted a total of 13 x 10^6 [13 million] tonnes per year or roughly half of total UK landfilled wastes."

There are almost four thousand currently operating sites in England and Wales and it was noted that:

"the results are not taken as strictly representative; for there has been an unavoidable bias towards the larger, newer and better managed sites."

The study's findings are therefore difficult to extrapolate, but would likely underestimate the total number of sites with water pollution problems.

7. Friends of the Earth's Survey of Groundwater Monitoring by the Regulatory Authorities

In September 1990, Friends of the Earth contacted the 83 waste disposal authorities (WDAs), the bodies then responsible for regulating waste disposal, and the 10 regional offices of the National Rivers Authority (NRA), the body responsible for safeguarding water quality, in England and Wales.

Both sets of authorities were asked to provide details of the number and identity of landfill sites (both open and closed) for which they held results of groundwater monitoring data. They were also asked for details of the parameters which were monitored.

- *Only 7% of landfill sites monitored by WDA or NRA*

Of the 73 WDAs who responded, 56 WDAs were prepared to provide the information requested, whilst 17 WDAs refused to provide the information. Ten WDAs failed to reply.

Details from the 56 WDAs providing information revealed that the authorities possessed information on 393 sites. 304 of the sites were operating, 82 sites were closed (whilst in the remaining 7 cases the status of the site was not specified).

If it is assumed that the WDAs who either did not reply or refused to provide information conduct an average amount of monitoring (a figure of seven monitored sites per WDA was estimated on the basis of the replies received), the figure provided can be extrapolated to give an estimated 582 landfill sites monitored by all WDAs in England and Wales.

All 10 NRA regions stated that they held groundwater monitoring for landfill sites and identified a total of 148 sites. Twenty of these sites were operating, 10 sites were closed (whilst in the remaining 118 cases the status of the site was not specified).

Even assuming no overlap between the sites monitored by the WDA and the NRA, this only gives a total of 700 landfill sites monitored for groundwater pollution. Since there are approximately 10,000 open and closed landfill sites in England and Wales, this represents monitoring at only 7% of sites.

- *Many pollutants not routinely monitored*

However, many of the replies from the WDAs or NRA regions gave very little information about the monitoring programme. But from the limited information provided it seemed that many potential pollutants (such as trace organic compounds or heavy metals) were not routinely tested. The replies revealed that the testing frequency varied from monthly to once a year[60].

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[60] Friends of the Earth (1991). *Survey of groundwater monitoring of landfill sites by waste disposal authorities and the National Rivers Authority,* in *The Risk of Surface Water and Groundwater Pollution due to the Landfill Disposal of Waste in England and Wales.* FOE Report to the European Commission.

8. Friends of the Earth's survey of groundwater pollution in East Anglia.

In 1993, Friends of the Earth studied the groundwater monitoring data held by Waste Regulatory Authorities and the National Rivers Authority in East Anglia.

- *Toxic pollution was found in groundwaters associated with landfills.*

Pesticides, solvents, cadmium and mercury was found in the groundwater associated with 18 landfill sites. Groundwater contamination by dangerous chemicals was found at almost a third of those sites that were monitored.

- *Many sites were not monitored.*

Over 90 per cent of 587 open and closed landfills in the region had not been monitored by the authorities for groundwater pollution for the three year prior to the publication of the study.[61]

9. Environment Agency inventory of groundwater pollution

In 1997, the Environment Agency published the first national inventory of groundwater pollution from point sources (e.g. landfills). The inventory found that landfills accounted for a third of the 1,205 sites of identified underground water pollution.[62]

Examples of Water Pollution by Landfill Sites

There are many examples of pollution of either groundwater or surface water caused by the migration of leachate from waste landfill sites. Ten illustrative examples are given below.

Commonside landfill site, Alvanley, Cheshire

A closed landfill site at Alvanley, Cheshire, known to have been used to dispose of industrial waste, has been observed to discharge a number of persistent toxic materials into a nearby stream. High levels of polychlorinated biphenyls have been recorded in the stream sediments[63]. The local authority has informed the public that stream water should not be used for irrigation and that farmers whose land is adjacent to the stream should prevent cattle from drinking there. Substantial remedial measures were prevented because the site owner does not have the financial resources to undertake such work. A company which is believed to have produced a substantial proportion of the waste at the site has refused to accept liability but has stated that it is prepared to offer technical advice[64].

AEA landfill sites, Harwell, Oxfordshire

Two closed landfill sites, known to have been used for the disposal of solid and liquid industrial wastes and owned by the UK Atomic Energy Authority, have been found to be leaking chlorinated solvents into groundwater beneath the sites[65].

Four kilometres away a public supply borehole at Blewbury in the Thames Valley had experienced problems with contamination by carbon tetrachloride which is likely to have originated from the AEA sites.

The AEA has agreed to pay for full remedial measures at the Harwell site. The clean-up costs are thought likely to run into millions of pounds and to take at least a decade[66].

Gallows Hill landfill site, Hyde Heath, Dorset

Leachate from a closed landfill site has polluted heathland designated by the Government as a Site of Special Scientific Interest (SSSI) which supports populations of endangered sand lizards and smooth

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[61] Friends of the Earth (1994). *Hit or Miss, Groundwater contamination associated with landfill sites in East Anglia.*

[62] Environment Agency (1997). *Groundwater pollution: evaluation of the extent and character of groundwater pollution from point sources in England and Wales.*

[63] The ENDS Report, December 1990. *PCB leaks from landfill highlight legal problems over contaminated sites.*

[64] The Independent, 14 March 1991. *Disused tip pours out a toxic legacy.*

[65] National Rivers Authority (1990). *NRA discovers groundwater pollution in South Oxfordshire*. Thames Region Press Release, March 22nd, 1990.

[66] The ENDS Report, April 1992. *Harwell faces big bill for landfill pollution clean-up.*

snakes. Polluted surface water has reached the nearby River Piddle[67].

Landfill sites, Helpston, Cambridgeshire

Three polluting landfill sites, located on a porous limestone geology, are implicated in polluting groundwater with pesticide wastes (including mecoprop and dichlorprop). In February 1992, the Anglian Region of the NRA stated:

"we have identified the three landfill sites as being the source of this pollution".

Two of the sites belong to Hunts Refuse Disposal and were licensed in 1980 and 1985. After 1983, they received, with the written permission of Cambridgeshire County Council, regular consignments of up to 2,000 gallons/week of pesticide washings. These pesticide wastes came from Farm Protection, then a pesticide manufacturing subsidiary of ICI.

Anglian Water's nearby Etton borehole, which supplies drinking water to 40,000 people in North Peterborough, was taken out of supply in 1990 whilst water treatment equipment was fitted. At present the mecoprop concentration in the raw water (8µg/l) at the borehole greatly exceeds the EC drinking water limit (0.1µg/l) but is reduced to below the limit following treatment.

The NRA has already expended £170,000 in investigating the source of pollution, whilst Anglian Water's capital outlay is estimated to be between £0.5 - £1.0 million, with running costs of around £30,000 per year[68].

Goulds Grove landfill site, Ewelme, Oxfordshire

Toxic liquids have seeped from the site and contaminated surrounding groundwater. A report by environmental consultants, published in September 1991, stated:

"from the results of the water quality monitoring carried out in the vicinity of the site it is considered that there is evidence of local contamination of the groundwater"

In November 1992, Oxfordshire County Council stated that:

"Oxfordshire County Council has identified the presence of chlorinated solvents in the groundwater near a private industrial waste disposal site at Ewelme".

Higher Kiln Quarry, Bampton, Tiverton, Devon

Contaminants have seeped from this site and polluted surrounding groundwater. Industrial wastes, including oils, cyanides, chromates and solvents have been dumped at the site. The site, which has been open since the late 1930s, is operated by Haul-Waste Ltd.

In October 1977, Devon County Council, the WRA, stated that:

"there is now evidence of oil underground...as the oil in the strata is a direct consequence of Messrs. Haul Waste's former activities and is now presenting an unpredictable environmental hazard, then it should be that Company's responsibility to remove it".

Monitoring by the National Rivers Authority (now the Environment Agency) revealed the presence of oil in groundwater around the site.

Foxhall landfill site, Ipswich, Suffolk

Contaminants have seeped from this site and polluted surrounding groundwater and are threatening surface water. This site, open since the early 1960s, is operated by Suffolk County Council.

In May 1991, Suffolk County Council, the WRA, stated that:

"groundwater has been grossly polluted by the landfill and the pollution plume is moving towards the Mill River".

Remedial measures costing over a million pounds have been taken to control the leachate[69]

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[67] The Independent, 20th May 1991. *Nature reserves polluted by tips.*

Letter to Friends of the Earth from National Rivers Authority , Wessex Region, 3 December 1990.

[68] National Rivers Authority (1992). *AWS Pumping Station.* Anglian Region press briefing, 13th February 1992.

[69] The ENDS Report, February 1992. *Counting the costs of leaky landfills.*

Tythegston landfill site, Bridgend, Mid-Glamorgan

There is evidence of contamination of the surrounding groundwater by the waste tip. This tip, which has accepted a wide range of materials, including hazardous wastes, is operated by Davies Bros (Waste) Ltd.

A Government study, published in 1978, stated:

"Evidence for the movement of leachate beyond the quarry perimeter was provided...by the distribution of chloride".[70]

Burnstump landfill site, Nottingham, Nottinghamshire

In 1988, Severn Trent Water Authority (then responsible for safeguarding water quality) reported contamination of the groundwater around the site[71]. A wide range of materials, including hazardous wastes have been dumped at this site, which is operated by Tarmac Econwaste Ltd.

West Bank Dock landfill site, Widnes, Merseyside

This site, closed in 1986, accepted a wide range of toxic chemical wastes It is situated on marshy land and bordered on two sides by brooks that feed into the Mersey, and on a third side by the Mersey itself.

In 1978, North West Water (the body then responsible for safeguarding water quality) highlighted the West Bank Dock landfill site as being a serious source of water pollution.

The report stated:

"At low water in the Tidal Mersey, leachates are seen to emanate from the three sides of the site which are bounded by watercourses"[72] .

Phenol was identified as being present in the leachate, which was also described as having a strong organic smell and having a distinctive black colour that suggested that waste cutting oils were present.

The report also suggested that pollution could be seeping directly into the Mersey through the ground. It stated that:

"It is feasible, therefore, that contaminated water from the site could enter the Mersey, particularly at low tide, by movement through the alluvium without being visible".

An investigation by FOE in 1992 revealed continuing pollution from the site.

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[70] Department of the Environment (1978). *Cooperative programme of research on the behaviour of hazardous wastes in landfill sites*.

[71] Severn Trent Water Authority (1988). *Leachate migration and attenuation in the unsaturated zone of the Triassic sandstones.*

[72] North West Water (1978). *Waste disposal site, West Bank, Widnes, Cheshire.*

Annex 5

About Groundwater

Since pollution of ground water is one of most important environmental problems associated with landfill sites, this annex provides background information on groundwater.

The Water Cycle

In common with other global processes, water moves in a cycle.

Evaporation from the oceans leads to precipitation onto the land as rain or snow. Part of this runs off into rivers and streams and finds its way back to the ocean whilst the remainder soaks into the ground.

Some of the water soaking into the ground is absorbed by plants as it percolates through the soil and is returned to the cycle by evaporation processes from the plants, another portion moves sideways though the soil into streams and rivers whilst the rest drains under gravity until it reaches underground bodies of water holding rock.

Water can then be discharged from these underground bodies in a variety of ways - to the sea, a river, a marsh or a well.

The proportion of water taking the various different routes in the cycle depends on many factors including climate, soil type, vegetation and moisture content of the soil.

Saturated Zone and Unsaturated Zone

On land, the water table marks the divide below which the formations are saturated with water (the saturated zone) and above which lies the unsaturated zone. The unsaturated zone includes the soil surface.

Aquifers, Aquitards and Aquicludes

Rock formations can be classified according to their water yielding capacity. An aquifer defines a formation that will supply a useful volume of water, an aquitard provides some water whereas an aquiclude supplies no water. There are a variety of different types of aquifer.

Unconfined Aquifer
An unconfined aquifer is not protected by an overlying layer of low permeability soil or rock and so the water table can move up and down according to the flow of water into and out of the rock.

Confined Aquifer
A confined aquifer is protected by an overlying layer of low permeability soil or rock, which restricts the movement of water through it. If the water table rises above the top of the aquifer, then this puts the water in the aquifer under pressure. Water will therefore spontaneously flow from a borehole if it taps into the aquifer and it's top is lower than the water table.

Perched Aquifer
A perched aquifer exists where a thin lens of low permeability soil or rock is present in an otherwise unconfined aquifer. If these lenses are close together or overlap, it can make the behaviour of the aquifer difficult to predict.

Hydrogeological Properties of Rock

Rock consists of a solid part (the particles of the rock themselves and the cement that binds them) and an empty part. Water is stored and moves through this empty part.

Porosity
The porosity of the rock is defined as the ratio of the empty (or void) space to the total volume and is usually referred to as a percentage or a fraction. The porosity of a rock can vary from less than 1% to more than 50%.

There are different types of porosities.

Primary Porosity
The primary porosity refers to spaces between the grains of rock. Sandstones are good aquifers with their capacity to transmit water mainly through this intergranular space.

Secondary Porosity
The secondary porosity refers to larger holes in the rock such as fissures or fractures. They can be caused either by stresses in the formations or by the passage of water "eating away" at the rock.

Whilst this secondary porosity usually constitutes only a small percentage of the total volume it has a significant effect on the behaviour of the rock. Limestones are good aquifers with their capacity to transmit water depending almost totally on interconnecting fissures rather than their primary porosity.

Surface tension effects
The use of a rock as an aquifer depends not only on how much water the rock can hold but also how much of it is free to drain away, since some water will remain "stuck" to the rock in some of the smaller holes due to surface tension effects.

A rock composed of small particles has a high surface tension and so the rock will produce very little water through drainage. This explains why clay, although it has a high porosity, is not an aquifer.

Groundwater Levels

By convention, the groundwater level is usually referred to as the groundwater head (also known as the hydraulic head, piezometric head or potentiometric head). The measurement is usually made in metres in relation to being above or below a fixed point.

In a confined aquifer this was measured by means of a piezometer. This tube like instrument is bored into the aquifer and allows the rise in the water to be measured. This has now been replaced by quicker electronic methods.

Groundwater levels can vary through the year, but the degree of fluctuation depends on the rock, with limestone aquifers varying by as much as 30 metres a year and sandstone usually fluctuating by less than 1 metre.

Relationship with River Flow

Groundwater and surface water are closely connected. For example, a river may have one of three relationships with an aquifer along any particular reach. If its base rests directly in contact with the aquifer it may either lose water or gain water from the aquifer depending upon the relative position of the water table. This relationship may change through the year as the position of the water table changes. If the river bed consists of low permeability material which stops flow in or out of the aquifer, then there will be little movement of water between the two.

Major Aquifers in Britain

The Chalk

The Chalk limestone aquifer covering areas of north, east and south England, is probably the most important aquifer in Britain.

Limestones are generally composed of cemented skeletal and shell remains of aquatic organisms. Limestone porosity varies from about 1% up to 50% but the primary value as aquifers is due to solution channels within them. Fissures and joints in the rock provide routes through which the water can flow relatively easily, and once flow has begun the walls of a fissure are dissolved and enlarged (although the secondary fissure porosity rarely exceeds 10%). The rock is subject to large and fluctuating changes in the water table. Pollutants are rapidly transported along fissures.

Permo-Triassic Sandstone

The Permo-Triassic Sandstones of northern, south-western and central England constitutes Britain's second most important aquifer.

Sandstone is composed of small grains of quartz and other minerals held together by a cement of calcite or silica. They have primary porosities of about 10-30% and secondary porosities of 1-2%, with intergranular flow much more important in sandstone than in limestone. They store more water than limestone which buffers against annual water table fluctuations (which are usually the order of 1 metre). Pollutants tend to move relatively slowly through sandstones (roughly 10 metres a year) and as a result it can take many years for pollution to appear in aquifers.

Other Aquifers

There are other examples of more minor limestone and sandstone aquifers of local importance. Mudstone, shales and recrystallized rock may be important aquifers on a local scale, but their low primary and secondary porosities mean that they produce only a limited amount of water. Sand and gravel deposits may be of significance as aquifers only on a local scale.

Annex 6

Landfill Liners

The design and construction of new landfill sites has become subject to increasingly stringent regulation aimed at minimising the risks of polluting water, and controlling the release of landfill gases. In the past, most landfills allowed free dispersal of leachate and gases from the site into the surrounding soils where - it was hoped - leachate pollutants would be filtered out, deposited, or degraded by microbial decomposition. Significant gas production is very much a result of developments in modern waste disposal practices and landfill design, and has therefore only become a problem in the last twenty years or so.

The result of the so-called "*dilute and disperse*" approach to leachate management has been that groundwaters have become contaminated, rendering potential drinking water supplies unfit to drink. Once groundwaters have become contaminated they are practically impossible - or at least extremely expensive - to clean up. In addition, the migration of asphyxiating and explosive gases has resulted in deaths and the destruction of properties. Trees and vegetation are killed by gases displacing oxygen around the root zone.

Increasingly, new sites are being required to incorporate some form of continuous impermeable barrier (*liner*) which, together with an impermeable layer at the surface (*the cap*) is intended to control water infiltration and retain leachate and gases within the site itself. Such sites are called *containment sites* and the technique is often referred to as *sanitary landfill.*

Moisture will, however, inevitably be present within such a construction due to rainwater and groundwater infiltration and due to the moisture content of the waste material itself. After percolating through the body of waste, leachate will collect above the liner at the bottom of the landfill from where it may be removed by means of a *leachate collection system (LCS).* The LCS consists of a system of perforated pipes (about 10 cm diameter) set within a layer of coarse permeable material such as sand or gravel and laid immediately above the bottom liner. Leachate is thereby allowed to drain from the site under gravity and collected for treatment or recirculation.

Some landfills incorporate a *groundwater collection system (GWCS)* - similar in construction to a LCS - to collect and remove groundwater from immediately below the liner. This prevents pressure building up causing the liner to "float" or rupture.

Liner construction

Materials

There are two basic categories of lining materials and these may be used alone or laid together in various combinations.

Mineral liners are naturally occurring clay soils compacted and laid up to about 1 metre thick. Where local soils do not contain enough clay to provide the required degree of impermeability, they may be enhanced by mixing with a high quality clay material called bentonite. The typical thickness of a "Bentonite Enhanced Soil" (BES) layer is 20 - 30 cm.

Synthetic liners (*geomembranes*, *geotextiles* or *flexible membrane liners - FMLs)* are sheets of plastic such as high density polyethylene (HDPE - currently the material of choice for landfill engineers). Synthetic liners are rolled out in strips like huge carpets and then welded or glued together side-by-side to produce a continuous field of plastic. The use of synthetic liners avoids having much of the landfill capacity taken up by thick layers of clay, and also allows for siting away from an economical source of suitable clay soil. A *geosynthetic membrane* is a high quality manufactured liner consisting of 6 mm of bentonite sandwiched between two layers of FML.

Construction

Liners require protection from damage in situ and a protective layer is therefore used to overlay and underlay the liner. A range of materials are used including granular materials, plastic sheets or bonded shredded tyres. The LCS or GWCS (incorporating a layer of gravel for example) may provide adequate protection to mineral liners.

Single liners consist only of a single layer (usually of clay) and are used where the perceived risk of

pollution or gas escape is minimal.

Double-Liners have two separate layers (usually both clay) and incorporate an additional LCS between the two.

Composite liners are constructed from a combination of clay and geomembrane laid in intimate contact. This construction is able to provide resistance to leakage under a wider range of conditions than either of the component materials alone. The depth of clay used in composite liners is usually reduced but a minimum depth of 60cm is recommended to give strength and durability.

Multiple liners consist of two separate layers and one or both of the layers being a "composite" structure. As with double liners, an additional LCS is incorporated between the two layers. This is the most sophisticated structure and provides the greatest protection against leakage.

Liner specification

The required standard and complexity of a liner is determined very much on a site-specific basis according to the perceived degree of risk to groundwater etc *(see below under "Risk assessment")*. It is accepted that no liner is able to provide a permanent and absolute barrier to leachate or gas, but an "acceptable" level of leakage (and hence liner specification) is assessed by taking a variety of factors into account.

The potential for leachate to contaminate groundwater depends on the nature of the surrounding soil formations and distance from the "saturated zone". A landfill sited in an area of low permeability soil, or some distance from an aquifer, will be considered to require a far less sophisticated liner than will a landfill built in sandy soil or gravel, or close to the saturated zone.

The significance of likely contamination is also assessed by taking into account the likely composition and quantity of the leachate and the sensitivity of the receiving waters.

Landfill gas presents the greatest risk where it is able to migrate through geological faults, service ducts or permeable soil formations. These features plus the presence of buildings, manholes or other confined spaces in the vicinity of the landfill will increase the required performance standards of the liner.

Liner Performance

It is accepted that the total elimination of leakage from landfills is impossible and the overall degree of environmental protection offered by a liner is dependent upon the liner conforming with the required minimum permeability rate. The important questions are whether these standards will indeed provide for adequate environmental protection and, if so, whether the standards are likely to be complied with in the long term.

Leakage rates through all lining materials are increased by damage during installation and by failures in the LCS. Careless tipping of bulky items, careless positioning of fencing posts, and vandalism have all caused damage, particularly to synthetic liners. Clay liners are susceptible to desiccation if left uncovered with waste for too long. Failures in LCS typically result from the clogging up of collection pipes by silt, mud, micro-organism growth or mineral precipitation.

In order to maximise the rate of production of landfill gas for commercial power generation, the increasing tendency is for new landfill sites to be engineered so that the body of the fill is kept moist by the recirculation of leachate. This practice will inevitably increase the susceptibility of liners to leakage and also the rate at which leakage occurs.

Unfortunately, and as experience has shown, it is quite unrealistic to expect liners to remain effective for anything like as long as would be required if groundwaters are to be completely protected from toxic leachate.

Clay liners are currently required to offer a minimum permeability rate of 10^{-7} cm per second[73]. In a study by GeoServices Inc. for the USEPA[74], it was calculated that, with three inches of leachate permanently present at the upper surface of a three-foot thick clay liner in good condition, it would take only fifteen years for leakage to break through.

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[73] Permeability is expressed in terms of flow. The smaller the number the more impermeable is the liner. 10^{-7} cm is one ten millionth of a centimetre.

[74] *Background Document on Bottom Liner Performance in Double-Lined Landfills and Surface Impoundments.* Prepared by GeoServices Inc. (Consulting Engineers) for US Environmental Protection Agency, April 1987.

Thereafter, it was calculated, leakage would continue at a rate of about 140 litres per hectare per day. In reality, the tendency for clay to form small "clods" or lumps - with leakage pathways between - mean that leakage rates through clay can be expected to be even higher than this theoretical figure.

But the impermeability of clay liners can be further diminished through chemical attack from components of the leachate. Most significant, however, is leakage through cracks and fissures which develop as the clay layer desiccates. Attempts to maintain dry conditions within the body of the landfill serve to exacerbate this effect.

Even in perfect condition, clay liners are generally ineffective at preventing gas migration.

Synthetic liners Even in pristine condition, liners made of HDPE can be expected to leak at the rate of 200 litres per hectare per day[75]. Significant leakage is caused by pinholes created during manufacture, and from imperfections in the seams where successive pieces are welded together. Even the best seams contain some holes.

In addition to pinholes and failed seams, HDPE actually allows some chemicals to pass through it quite easily. A 1991 study by the University of Wisconsin shows that dilute solutions of solvents such as toluene, xylene, trichloroethylene (TCE) and methylene chloride penetrate HDPE in one to thirteen days. These solvents are commonly found in leachates. A "delux" HDPE sheet 2.5 mm thick is penetrated by solvents in less than two weeks. Even in minute concentrations, these chemicals would be unacceptable in drinking water supplies. Chemical attack, for instance from constituents of the leachate itself, can degrade the liner and the adhesives which bond the sheets together.

But perhaps the most fundamental inherent defect in geosynthetic liners is the fact of polymer "ageing". As time passes, plastics decompose and their physical characteristics change. Within a few years HDPE and other polymers inevitably become brittle, lose their strength, crack and break into fragments. At that point the liner material is rendered entirely ineffective as a barrier against escaping leachate or gas.

This ageing is accelerated by the mechanical and chemical stresses placed on liners in typical landfill conditions. HDPE liners have been shown to fail due to "stress cracking" or "brittle fracture" within two years of use. HDPE is attacked by numerous chemicals which are in common household use[76] and can therefore be expected to appear in leachates in landfills containing municipal waste.

Regulation

The required liner specification for a given site is defined within the conditions of the waste management licence according to the perceived risks associated with gas and leachate escape. Regulation 15 of the Waste Management Licensing Regulations 1994 stipulates that adequate protection must be afforded to groundwaters and it is then up to the landfill engineer to demonstrate that the proposed construction will be capable of fulfilling this requirement.

Standards and recommended practice in landfill design, construction and operation is provided in the Department of the Environment (DoE) Waste Management Paper 26B (WMP 26B) and references. Landfill engineers are expected to maintain a familiarity with various authoritative works relating to research into liner materials and construction.

As a statutory consultee to the planning process, it is the responsibility of the Agency to determine the acceptability of the expected rate of leachate leakage from a landfill site. The pollution threat is assessed against the Agency's Groundwater Protection Policy[77] which allows for a certain amount of leakage where there is "adequate" attenuation or dilution to minimise pollution. It is accepted that total containment is impossible, but this concept of "acceptable seepage" into the saturated zone is at odds with the

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[75] Bonaparte, R. and Gross, B. (1990). *Field behaviour of double-liner systems.* In R. Bonapart (Ed): *Waste containment systems: construction, regulation and performance.* American Society of Civil Engineers, Geotechnical special publications No. 26,. pp 52-83.

[76] *Kirk-Othmer Encyclopedia of Chemical Technology, 3rd edition.* Pubs: Wiley. Citing study conducted by HDPE manufacturers, Phillips Petroleum Company.

[77] NRA Policy and Practice for the Protection of Groundwater. National Rivers Authority, Bristol 1992.

requirements of the EC Groundwater Directive[78] *(see Section 12)*.

Risk Assessment

The attitude both of the Agency and the DoE towards environmental risks from landfills is one of "acceptable risk management". A process of *risk assessment* is carried out by the licence applicant in order to identify the environmental risks and the licence may or may not be granted on the basis of perceived risk.

Risk assessment inevitably involves a number of assumptions relating to liner performance, longevity, installation standards, composition and quantity of gas and leachate, toxic effects of the components of gas and leachate, etc. Many of these assumptions are subject to great uncertainties. Synthetic liners, for instance, have been in existence for less than fifty years and accurate predictions of long-term performance are therefore impossible. A recent study by the Centre for Environmental Control and Waste Management (Imperial College, University of London)[79] concluded that there are many questions that remain unanswered as to the effectiveness of synthetic landfill liners. Furthermore, recent evidence concerning the toxic effects of some components at hazardous waste sites suggests that the risks to residents and workers should be carefully scrutinised[80].

This dependence on such major assumptions clearly undermines the validity of the risk assessment process. The emergence of new evidence which clarifies some of the uncertainties means that some reappraisal of what is "acceptable" risk will have to be made.

Conclusions

When a liner has degraded or become infiltrated to such an extent that groundwater is no longer protected and gas is allowed to escape, the liner can be said to have failed. Many of the toxic materials in leachate - notably metals such as nickel, lead, cadmium and zinc - will never degrade and will remain toxic forever. Many of the halogenated organic compounds - for instance dioxins in incinerator ash - will certainly take decades to decompose. Within the industry, liner failure is commonly expected to occur within about twenty-five years or so.

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[78] Directive 80/68/EEC on the Protection of Groundwater from Certain Dangerous Substances.. Official Journal L20. January 1980.

[79] Buss, S.E *et al.* (1995). *Mechanisms of Leakage through Synthetic Landfill Liner Materials*. Journal of Ch. Inst. Water and Environmental Management. 9/9/95

[80] Johnson, B.L, Assistant Surgeon General, United States Agency for Toxic Substances & Disease Registry, US Dept. of Health and Human Services. Testimony before the Sub-committee on Superfund, Waste Control, and Risk Assessment - Committee on Environment and Public Works, US Senate, March 29th, 1995.

Annex 7

Campaigning Against Existing Landfill Sites

This annex looks at the conditions that are attached to licences to operate landfill sites (waste management licences) and the powers the Agency have to change or vary them. It also looks at the duties landfill operators have with regards Duty of Care and Health and Safety. This annex also details the powers that are held by local authorities with respect to open and closed landfill sites and provides suggestions on campaigning on these existing landfills**.**

Licence conditions

The licence can contain any conditions which the Agency considers necessary in order to maintain an appropriate standard of construction, operation and restoration. Government guidance about potential conditions is fairly detailed (see WMP 4, Chapters 4 and 5). Important areas which should be covered are:

- preparatory work that must be carried out before a site opens;
- the provision of secure boundary fencing and gates;
- methods for ensuring that adjacent public roads are kept free of mud and waste materials;
- the types of waste that can be accepted at the site;
- the method of measuring the weight of waste to be deposited in the site and the permitted rate of input;
- the minimum number of staff required on site and any special technical competence which they need;
- operational matters, such as how waste is to be handled, segregated and compacted, the method of controlling potential nuisances, such as smoke, dust, litter, vermin, noise and smell, permitted working hours and the exclusion of unauthorised persons;
- monitoring of environmental effects (such as gas, leachate, surface and ground water etc.) and the records which must be kept;
- the records that need to be kept concerning the amount, type and origin of waste deposited and the frequency with which returns based on these need to be sent to the Agency;
- the keeping of a site diary recording significant events;
- the pollution control mechanisms that need to be maintained after the site has closed.

If the Agency proposes to issue a licence authorising landfilling in circumstances where groundwater is put at risk of contamination by certain toxic substances, it is under a duty to carry out special investigations and/or impose appropriate conditions. The standard of protection required for groundwater is defined in the EC Groundwater Directive[81] (see regulation 15 of the WML Regulations and Annex 7 of Circular 11/94 (WO 26/94) and in the Agency's *Policy and Practice for the Protection of Groundwater*.

Once a licence has been issued, a copy of it must be placed on the register of current waste management licences. You can thus inspect it at the local offices of the Agency or Waste Collection Authority (WCA) - part of the District Council (or Unitary Authority). Copies should be available at a "reasonable" charge.

Supervision and review

The Agency is under a legal duty to supervise all licensed landfills so as to ensure that the conditions of the licence are adhered to and that no pollution, harm to human health or other "detriment" to the local area is caused.

The Environmental Health Department (or some

[81] *Council Directive 80/68/EEC of 17 December 1979 on the Protection of Groundwater Against Pollution Caused by Certain Dangerous Substances*

similarly named department) of the local authority is responsible for taking action against nuisance from all sites. Nuisance might include litter, noise, vermin, smoke and dust. In practice, the distinction between detriment and nuisance is not clear and may be the subject of discussion between the Environmental Health Department and the Agency in particular cases.

Agency inspectors have the power to enter landfill sites in order to carry out investigations, take photographs and samples and examine site records. Inspectors can be accompanied by any person authorised by the Agency. The Register should contain a record of any occasions upon which an inspector has visited the site and any action that was taken.

The Agency also has the power to serve written requests for information on any licence holder and to require them to reply within a specified period.

The Agency can carry out pollution abatement works on a landfill site in an emergency and recover the costs from the licence holder. Details of remedial or preventive action taken will appear on the Register.

If necessary, the Agency has the power to alter any conditions of licences, provided that this is unlikely to cause unreasonable expense to the licence holder. If necessary, the Agency has a duty to alter the conditions (vary the licence) to prevent pollution of the environment or harm to human health. A licence holder can also apply to have the licence varied.

Similarly, in order to prevent pollution of the environment or harm to human health, the Agency may revoke or suspend a licence either completely or in respect of certain activities carried on at the site. For example, the Agency could intervene to prevent water pollution.

The Agency may revoke or suspend a licence if the holder is subsequently convicted of a relevant offence or is no longer considered technically competent. However, the Agency cannot revoke or suspend a licence on the grounds that the holder ceases to have adequate financial means to meet the obligations laid down in the licence. The Agency must wait until a lack of financial means results in a breach of licence conditions in practice.

The Registers held by the Agency and the WCA should both contain details of any notices issued by the Agency which alter licence conditions and revoke or suspend licences.

Transfer of licences

A licence cannot be transferred by the holder to a new site operator without a joint application being made to the Agency. The application has to contain certain prescribed details (set out in Schedule 2 to the WML Regulations) including the proposed transferee's name, address and telephone number, any convictions for relevant offences and the name, details of the technical competence of the proposed site manager and details of the financial provision which the transferee proposes to make.

A copy of the application for transfer will be placed on the Register and it will normally be decided within 2 months.

Surrender of licences

The EPA 90 prevents operators from surrendering licences until the Agency is satisfied that the landfill is no longer likely to cause pollution of the environment or harm to human health.

The licence holder must make an application to surrender the licence and supply the information and evidence laid down in Paragraph 2 and Schedule 1 of the WML Regulations. This includes:

- a description of the activities that have been carried on at the site (whether or not covered by the licence);
- an indication of when they were carried on;
- an estimate of the total quantities of the different types of waste deposited at the site;
- particulars of the engineering works carried out to prevent pollution or harm to human health, including an indication of when they were performed, a copy of relevant plans and details of works of restoration carried out since landfilling has stopped;
- geological, hydrological and hydrogeological information relating to the site and the surrounding area;
- monitoring data on groundwater quality, production of landfill gas and leachate and information about the physical stability of the site.

A copy of the application to surrender must be placed on the Register.

The Agency must inspect the site and can ask for further information. Information and evidence obtained in this way must also be placed on the Register.

WMP 26A sets out the prerequisites for the Agency to accept the surrender of a licence. It must ensure that adequate completion monitoring has been carried out and that the site is no longer producing leachate or gas in harmful quantities.

A decision on an application to surrender should normally be taken within three months. The surrender is confirmed by the issue of a Certificate of Completion and a copy of this is placed on the Registers held by both the Agency and the WCA. If the surrender is refused, a copy of the refusal will be placed on the Register held by the Agency.

Appeals

Landfill operators can appeal against any decision by the Agency to change or vary and conditions attached to the waste management licence.

If an appeal relates to a change in the conditions attached to a licence, and if the Agency has stated on its notice of decision that the changes are required in order to "prevent or minimise pollution of the environment or harm to human health", the licence holder must observe those changes immediately.

However, Friends of the Earth believes that the Agency is unlikely to use that power because, if the appeal is successful, they will be liable to pay compensation to the licence holder in respect of the costs incurred by the licence holder in complying with new conditions.

Compensation in respect of lost revenue may also be granted if the appeal determines that a decision to suspend a licence was unreasonable.

The Duty of Care

The Duty of Care, introduced by the EPA 90 and brought into force on 1st April 1992, attempts to place greater responsibility on those in the waste chain (from initial producer to final disposer) to ensure that the waste they handle does not harm human health or pollute the environment. Breach of the Duty of Care is a criminal offence; conviction in a Magistrates Court can result in up to six months imprisonment and/or a fine of up to £20,000. In a Crown Court, conviction can result in up to two years imprisonment and/or an unlimited fine.

Section 34 of the EPA 90 imposes a duty on all waste holders (anyone who produces, imports, carries, keeps, treats or disposes of controlled waste) to take all reasonable measures to:

- prevent the unlicensed keeping, treatment or disposal of waste by any other person, or the keeping, treatment or disposal of waste in a manner likely to cause pollution of the environment or harm to human health;
- prevent the escape of waste from control;
- ensure that the waste is transferred to an authorised person (such as the holder of an appropriate waste management licence or a waste carrier registered under the Control of Pollution (Amendment) Act 1989); and
- ensure that an adequate written description of the waste is transferred with it.

The Government has issued a code of practice[82] and Regulations[83] on the documentation requirements imposed on waste holders. A Circular[84] details how the Duty of Care is to be enforced by the Agency.

Health and Safety

The *Health and Safety at Work Act 1974* imposes a general legal duty on employers to ensure the health, safety and welfare of employees in the workplace. This duty is enforced by the Health and Safety Executive (HSE) - a national body answerable to a variety of Ministries. Under the 1992 Health and Safety at Work Regulations, employers are required to

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[82] Department of the Environment (1991). *Waste Management: the Duty of Care: A Code of Practice.*

[83] Environmental Protection (Duty of Care) Regulations 1991, SI 1991/2839.

[84] Department of the Environment (1991). Environmental Protection Act 1990, Section 34, "the Duty of Care", Circular 19/91.

undertake a formal assessment of the risks to which employees are exposed, and to take adequate measures to mitigate those risks. Such risks may relate, for example, to the operation of machinery, or landfill gas management. In theory, Health and Safety controls also extend to risks to which the general public are exposed from landfills.
Many landfills will also fall within the requirements of the Control of Substances Hazardous to Health (COSHH) Regulations, whereby employers are required to implement special measures to prevent or control employees' (and the public's) exposure to hazardous substances.

Health and Safety requirements only become relevant once the site is up and running. There may, however, be opportunities for pressure to be brought on badly-run sites by drawing attention to breaches of Health and Safety.

Nuisance

A *statutory nuisance* (ie a nuisance which can by acted against in law) could be caused by smoke, fumes, gases, dust, steam, odour, effluents, flies, rodents, noise, leachate, gas or litter. Local authorities (usually the environmental health department) are under a duty to inspect their areas for statutory nuisance under Section 79 of the EPA 90. The local authority is obliged to investigate if a complaint is received from the public. If the local authority considers that a statutory nuisance exists or is likely to occur, they are under a duty to serve an *abatement notice* on the operator. The abatement notice can specify the particular actions which must be undertaken to prevent the nuisance from recurring and the time within which action must be taken.

If the person fails to comply with an abatement notice, then he or she is guilty of an offence and liable on conviction to a large fine. In addition, the local authority has the power to abate the nuisance itself and recover the costs from the person responsible for the problem.

To date, these powers have been relatively little used by District Councils. This may be due to lack of resources or it may be due to confusion over whether responsibility for monitoring potential problems from landfill sites lies with them or the Agency.

If you are concerned that a landfill is causing pollution, harm to human health or a nuisance, you can campaign to make sure that the conditions attached to the planning permission or the waste disposal licence are enforced. If any conditions are being breached, you can demand that the operators are prosecuted and the waste disposal licence revoked. You could even consider taking out a private prosecution against the operator, or against the Environment Agency or Environmental Health Department for negligence or breach of statutory duty - but you will need legal advice.

Friends of the Earth has produced a briefing sheet on Statutory Nuisance.

- **Obtain a copy of the planning permission and the waste management licence**

Planning permissions are held on a register at the planning authority. All current licences and conditions (and applications for licence modification) are kept on a public register held by the Agency.

- **Find out if the tip is polluting**

You can find out whether pollution is occurring by examining the results of monitoring carried out by the environmental health department of the local authority, the Agency and the operator itself.

Ask the Agency, the Environmental Health Department at the District Council, and the site operator for the results of all environmental monitoring, particularly monitoring of groundwater and surface water quality and methane production and migration.

Under Section 64 of the EPA 90 the Agency is required to keep a public register of information concerning waste disposal. Among other things, the Register should contain information on "such matters relating to the treatment, keeping or disposal of waste in the area of the authority or any pollution of the environment caused thereby as may be prescribed."

You can ask the Agency if a closed tip is polluting water, and inspect the public register for evidence of pollution in nearby groundwater or surface water. The Register is held at the regional Agency office. The Register includes:

- Details of any permission the operator has to discharge waste into controlled water;
- Results of routine monitoring of controlled waters;
- Results of monitoring to check whether

discharges meet their consent conditions (although many discharges are not regularly monitored).

The Register may also contain the results of monitoring carried out by other bodies such as the Agency or the operator.

If you suspect that a landfill is polluting water, don't wait until you've got time to inspect the Register - report it to the Agency immediately!

The Agency can prosecute polluters, although the overwhelming majority of pollution incidents do not result in legal action. If you unearth evidence of pollution and the Agency does not prosecute, ask it why this was, and what was done to ensure that the pollution does not recur.

You may wish to take your own samples and have them analysed by the Public Analyst - an analytical laboratory service associated with the local authority. However this can be extremely expensive so you would be well advised to seek data from the regulatory bodies first. Once you know what pollution is occurring you may want to take a token sample as a media stunt - make sure the local press come along with you.

Demanding Enforcement of Operating Conditions

Planning Permission. Most local authorities do not have enough resources to monitor and enforce every breach of planning control, and most rely on complaints from the public.

The Council has various powers to enforce planning control. It can take out an "enforcement notice" requiring the owner or occupier of the land to take specified steps to remedy the breach. It may issue a "stop notice" or injunction to prevent unlawful activity.

Under the Planning and Compensation Act 1991, planning authorities can serve a "planning contravention notice" seeking information relating to the use of land, and a "breach of condition notice" for non-compliance with a condition of planning permission. It is a criminal offence to ignore either notice or to provide incorrect information in response to a contravention notice. Planning authorities have wide powers to enter land at any reasonable time to see if there has been a breach of planning control.

Waste Management Licence. Under Section 42 of the Environmental Protection Act 1990 (EPA 90), the Agency has a duty to supervise licensed activities to ensure that the conditions of licences are observed and that no pollution or harm to human health is occurring. They have the power to carry out necessary remediation work in an emergency and to recover the cost of doing so from the licence holder or previous licence holder.

Under Sections 37 and 38, the Agency can amend the conditions of a licence. It can revoke or suspend the licence where the holder has ceased to be a "fit and proper person", where the conditions are being breached and the operator has failed to comply within a specified time, or where the continuation of activities would cause pollution of the environment, harm to human health or would be seriously detrimental to local amenities.

Unfortunately the Agency all too often lack the resources, both financial and human, that they need to monitor and enforce the licence conditions and ensure that landfill sites do not pollute the environment or harm human health. Furthermore, if the Agency require that remediation work is carried out, and the operator successfully appeals against the need for the work, the Agency will be liable to pay compensation. For this reason, the Agency are likely to be reluctant to use their powers to the full.

It is therefore extremely important that concerned residents campaign to ensure that licence conditions are enforced and pollution prevented.

Annex 8

Reading List

Friends of the Earth Documents

The following papers are available from the Industry and Pollution team, Friends of the Earth, 26-28 Underwood Street, London N1 7JQ (please enclose an A4 SAE).

Don't Burn it or Bury it - Alternatives to Landfill and Incineration (1997)

Dirty Money - FOE's critique of the Government's Strategy for Sustainable Waste Management in England and Wales (1996)

Hit or Miss? Groundwater Contamination Associated with Landfill Sites in East Anglia (1994)

Recycling - Memorandum of Evidence by Friends of the Earth - FOE's evidence to the House of Commons Inquiry on Recycling (1993)

The following can be ordered from Friends of the Earth, Publications Despatch, 56-58 Alma Street, Luton, LU1 2PH. For queries and credit card purchases, telephone 01582 482297, 2-4pm. There are reduced prices for Friends of the Earth Local Groups.

Up in smoke... why Friends of the Earth opposes incineration (1997)

Working Future? Jobs and the Environment. A FOE Discussion Paper (1994). £5.95.

Buyer Beware: A guide to finding out about contaminated land. FOE (1993). £5.45.

Wildlife, Planning and Developments (1995). £1.00.

The following briefing sheets can be requested from the Local Campaigns Department, Friends of the Earth, 26-28 Underwood Street, London N1 7JQ. Telephone: 0171 566 1677.

How to make the most of public inquiries (1994)

Using Your Right to Know (1994)

Using Your Right to Know in Northern Ireland (1996)

Statutory Nuisance (1995)

European Community laws

92/43/EEC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Official Journal L206/7 22.7.92)

85/337/EEC Directive on the assessment of the effects of certain public and private projects on the environment (Official Journal L 175/40, 5.7.1985), amended by
97/11/EEC (Official Journal L73/5, 14.3.97) (which does not take effect until 14.3.99).

80/68/EEC Directive on the Protection of Groundwater Against Pollution Caused by Certain Dangerous Substances (Official Journal L20/43, 26.1.1980).

75/442/EEC EC Directive on waste (Official Journal L194/39, 25.7.1975), as amended by
91/156/EEC (Official Journal L78/32, 26.3.1991) and
91/692/EEC (Official Journal L377/48, 31.12.91 commonly referred to as the Framework Directive on Waste.

91/689/EEC Directive on Hazardous Waste (Official Journal L377/20, 31.12.1991 as last amended by
94/31/EEC Official Journal L168/28 of 2.7.1994.

Important Acts and Statutory Instruments

Planning and Compensation Act 1991
Water Resources Act 1991
Environmental Protection Act 1990
Town and Country Planning Act 1990
Local Government (Access to Information) Act 1985
Occupier's Liability Act 1984
Control of Pollution Act 1974

Health and Safety at Work Act 1974

SI 1995/418	The Town and Country Planning (General Permitted Development) Order
SI 1995/419	The Town and Country Planning (General Development Procedure) Order
SI 1994/1056	Waste Management Licensing Regulations
SI 1994/3246	Control of Substances Hazardous to Health (COSHH) Regulations
SI 1993/2051	Health and Safety at Work Regulations
SI 1992/3240	Environmental Information Regulations
SI 1991/2839	Environmental Protection (Duty of Care) Regulations
SI 1988/1199	Town and Country Planning (Assessment of Environmental Effects) Regulations
SI 1985/2023	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
SI 1977/289	The Town and Country Planning General Development Order

Northern Ireland Laws

Statutory Rules:

SR:1993/278	The Planning (General Development) Order (Northern Ireland) 1993
SR:1989/20	The Planning (Assessment of Environmental Effects)Regulations (Northern Ireland) 1989
SR:1989/290	The Planning (Use of Classes) Order (Northern Ireland) 1989
SR:1992/254	The Waste Collection and Disposal Regulations 1992

Statutory Instruments:

SI:1991/1220NI11	The Planning (Northern Ireland) Order 1991
SI:1978/1049NI19	Pollution Control and Local Government (NI) Order 1978

DoE/WO Circulars

Circular 15/96	Planning Appeal Procedures
Circular 9/95 (WO 29/95)	General Development Order Consolidation 1995
Circular 11/94 (WO 26/94)	Waste Management Licences
Circular 19/91 (WO 63/91)	Environmental Protection Act 1990, Section 34, "the Duty of Care"
Circular 20/90 (WO 34/90)	EC Directive on the Protection Of Groundwater (80/68/EEC)
Circular 15/88 (WO 23/88)	Environmental Assessment
Circular 4/82 (WO 7/82)	EC Directive on the Protection Of Groundwater (80/68/EEC)

Waste Management Papers (WMPs)

WMP 4	*Licensing of Waste Management Facilities* (DoE 1976)
WMP26	*Landfilling Wastes* (DoE 1986)
WMP 26A	*Landfill Completion* (DoE 1976)
WMP26B	*Landfill Design, Construction and Operational Practice (*DoE 1995)
WMP 26E	*Landfill Restoration and Post Closure Management* - Consultation Draft. Environment Agency (1996). This will be a (part) revision of WMP 26 and should be published in mid-1997.
WMP 27	*Landfill Gas* (DoE 1991)

Planning Policy Guidance Notes (PPGs) and Technical Advice Notes (TANs)

PPG 1	General Policy and Principles (1997)
PPG 9	Nature Conservation (1994)
PPG 13	Transport (1994)
PPG 23	Planning and Pollution Control (1994) (under revision)

NB: It is unclear when a revision of PPG 23 will be produced, or whether the Revision will be published as a separate document; the latest information on this can be obtained from the DOE on 0171 276 3000.

For Wales: Planning Guidance (Wales): Planning Policy (1996)

PPG 13 Transport (1988) - Appendices only
TAN 5 Nature Conservation and Planning

This Welsh Planning Guidance is a consolidation into the Welsh context of PPGs which were formerly issued jointly with the DOE (see note in Section 9).

Reports and Papers

The Environment of England and Wales - a Snapshot (Environment Agency 1996).

Groundwater Pollution: Evaluation of the Extent and Character of Groundwater Pollution from Point Sources in England and Wales (Environment Agency 1997).

Making Waste Work - A Strategy for Sustainable Waste Management in England and Wales (Department of the Environment 1995).

*NRA Policy and Practice for the Protection of Groundwater (*National Rivers Authority [now Environment Agency] 1992).

*Landfill Gas - A report of the findings of surveys carried out by HMIP to assess the scale of the problem and provide recommendations for further action (*HMIP [now Environment Agency] 1991).

A study of the type and scale of environmental impacts from landfills accepting wastes other than domestic (Westlake, Sayce and Fawcett (1991), Atomic Energy Authority).

Waste Management: the Duty of Care: A Code of Practice (Department of the Environment 1991).

Field behaviour of double-liner systems. Wastesystems: construction, regulation and performance. In: American Society of Engineers (1990), R. Bonapart (Ed). Geotechnical Special Publications No. 26, pp 52-83.

Assessment of Groundwater Pollution (Department of the Environment 1988).

Cooperative programme of research on the behaviour of hazardous wastes in landfill sites (Department of the Environment 1978).

Books on planning permission

CPRE (Council for the Protection of Rural England) (1997). *Campaigners' Guide to Public Inquiries and Planning Appeals.* CPRE, Warwick House, 25 Buckingham Palace Road, London SW1W 0PP, telephone: 0171 976 6433.

Dowling, J A. (1995). *Northern Ireland Planning Law*. Gill & Macmillan. ISBN 0 717 12340 5.

Speer, R and Dade, M (1994). *How to Stop and Influence Planning Permission.* London, JM Dent. ISBN 0 460 86194 8.

Tracking policy

The ENDS Report, published by Environmental Data Services Ltd, is an excellent monthly journal which tracks environmental policy. You might find it at your local library. Subscriptions from: Environmental Data Services Ltd, 40 Bowling Green Lane, London EC1R 0NE, telephone: 0171 278 4745; e-mail: post@ends.co.uk.

Where to find the documents

Official documents can be obtained from:
The Stationery Office (or agents), 49 High Holborn, London WC1V 6HB; 0171 873 0011.
In Wales, Oriel Bookshop, The Friary, Cardiff CF1 4AA; 01222 395548.
In Northern Ireland, 16 Arthur Street, Belfast BT1 4GD; 01232 238451.

Some reports (and particularly draft documents) can be obtained from the originating source:

Department of the Environment, 0171 276 3000*;*
Welsh Office, 01222 825111;
DOE - Northern Ireland, 01232 254754;
Environment Agency, 0645 333111.

Land ownership

HM Land Registry headquarters are at 32 Lincoln's Inn Fields, London WC2A 3PH; 0171 917 8888.

Glossary

Attenuation
The effect of soils and rock strata which surround a landfill reducing the harmful effects of polluting substances through absorption, chemical reactions and dilution.

Aquifer
A permeable geological stratum or formation that is capable of both storing and transmitting water (groundwater) in significant amounts.

Bioreactor
A landfill which is designed to maintain high moisture content, thereby accelerating the decomposition of the waste material.

Bund
i) A structural embankment designed to prevent pollution by retaining spilled or leaked liquids.
ii) A small bank of soil or other inert material used to define working areas on the surface of an operating landfill.

Cap
The covering of a landfill, usually constructed of low permeability material, designed to control the infiltration of rainwater and control the release of gases.

Chemical waste
Liquid and solid waste material resulting from industrial chemical processes.

Clinical waste
Waste arising from medical and related practice, including human and animal tissue, dressings and used equipment eg hypodermic syringes.

Co-disposal
The practice of disposing of difficult or hazardous waste with municipal waste in order to encourage decomposition of the hazardous component.

Completion
The state whereby the chemical and biological decomposition of waste in a landfill has progressed to the point whereby leachate and gas from the site no longer represents any pollution threat or hazard to human health.

Composite liner
A landfill liner consisting of a layer of natural soil or clay in close contact with a layer of synthetic material such as plastic sheeting ("geomembrane" or "flexible membrane liner").

Consultation
The official process of requesting the views of the public and other interested parties before reaching decisions on regulatory matters such as granting waste management licence or planning permission.

Consultee
A person or organisation who's views are sought in relation to a consultation. Statutory consultees are defined for particular types of consultation and must, by law, be consulted.

Containment
The concept of retaining leachate within a landfill, by means of an impermeable liner, in order to prevent pollution of groundwater and contamination of soil.

Controlled waste
Household, industrial and commercial waste (as defined in Section 75 of the Environmental Protection Act 1990) and for which legal provisions exist for its proper storage, handling and disposal.

Controlled waters
All rivers, canals, lakes, groundwater, estuaries, and coastal waters (within three miles of the shore).

Developer
The individual or company to whom planning permission has been granted.

Difficult waste
Waste which is particularly problematic for handling or disposal.

Discharge consent
A permit which allows (conditional) release of liquid waste to controlled waters. Consents are granted by the Environment Agency (previously the NRA).

Environment Agency
A statutory body with considerable responsibilities for pollution control and other environmental matters. Formed in 1996, absorbing Her Majesty's Inspectorate

of Pollution, the National Rivers Authority and the Waste Regulatory Authorities.

Environmental (Impact) Assessment, EIA or EA
The process of gathering information about the likely impact that a development is likely to have on the environment. Required in order to obtain planning permission for certain types of development.

Environmental statement, ES
The written report presenting the findings of the Environmental Assessment.

Flexible membrane liner, FML
Plastic sheeting used in the liner of a landfill

Gas collection system, GCS
The system of perforated pipes arranged throughout the body of the landfill, designed to collect gases as they are generated by the decomposition of the wastes and to direct the gas to the surface in a controlled way.

Geomembrane
Another name for synthetic plastic sheeting used in liner construction.

Geomorphology
The rock strata and soil within which the landfill is constructed.

Groundwater
The mass of water held in layers of porous rock below the surface of the ground

Groundwater collection system, GWCS
A system of perforated pipes set within a permeable layer of, for example, gravel at the outside of the landfill liner designed to channel groundwater away from the liner and thereby preventing a build-up of pressure.

Hazardous waste
Waste that meets the criteria in the Hazardous Waste Directive (91/689/EEC) by coming from a specified waste stream (Annex 1 of the Directive) and having one or more hazardous properties (Annex 3 of the Directive), and taking into account whether it contains any of some 50 hazardous substances (Annex 2 of the Directive).

Heavy metals
Metals such as copper, mercury, cadmium zinc, lead, chromium and arsenic. Heavy metals usually occur as "salts" and other compounds and are usually toxic.

Her Majesty's Inspectorate of Pollution, HMIP
Prior to the formation of the Environment Agency, HMIP was the Government body responsible for overseeing the waste regulatory performance of local authorities.

Inert waste
Materials that will not physically or chemically react or undergo biodegradation within the landfill.

Integrated Pollution Control, IPC
The regulatory regime for major industrial processes, overseen by the Environment Agency (previously HMIP). Larger incinerators have IPC authorisations, but landfills are unlikely to have these.

Landraise
The practice of depositing wastes in a manner similar to landfill construction, but entirely above the surface of the ground.

Landfill gas
The mixture of gases produced by the digestion by micro-organisms of putrescible matter present in waste deposited in landfill sites. The gas is predominantly methane and carbon dioxide together with trace concentrations of other vapours and gases.

Leachate
The liquid resulting from water seeping through the body of the landfill and in so doing extracting polluting substances from the wastes.

Leachate collection system, LCS
A system of perforated pipes set in a permeable layer (such as gravel) designed to allow leachate to be channelled under gravity to a central collection point at the bottom of the landfill.

Liner
An impermeable layer composed of clay or plastic sheeting, or a combination of both, used to line the sides and base of a landfill and designed to prevent uncontrolled seepage of leachate from the landfill into the surrounding soils and strata.

Local Planning Authority
The part of the local authority (usually the County Council or Unitary Authority) or, in Northern Ireland, the DoE, with responsibility for issuing planning permission.

Micropollutant
Substances which are toxic in the environment in concentrations of the order of microgrammes per litre.

Municipal waste
Domestic waste, together with similar waste from commercial or trade sources, street sweepings and the like, collected on behalf of the local authority. Household waste is just from households and so is less inclusive a term than municipal waste.

Operator
The individual or company to whom the waste management licence is issued and who is responsible for the day-to-day running of the landfill site.

Planning Committee
The committee of councillors within a local authority who have responsibility for decisions on planning applications.

Planning permission
Developments, including landfill sites, require permission from the planning authority in accordance with relevant planning policies and laws.

Point source
A source of pollution entering the environment from a specific location (such as a discharge pipe or a hole in a landfill liner). As opposed to a "diffuse source" which exists over a wider and less well-defined area.

Proof of evidence
A written statement of your objection, submitted to a public inquiry.

Public register
A collection of specified documents and information, required by law to be maintained for public inspection.

Putrescibles
Waste material, such as food, which decays rapidly.

Settlement
The amount by which a landfill surface sinks due to the reduction in volume of the waste as it undergoes degradation and compaction under its own weight. Settlement can be expressed as a percentage of the original depth of wastes.

Special waste
Waste which is considered to be *"so dangerous or difficult to treat, keep or dispose of"* (S. 62, Environmental Protection Act 1990) that special regulations (the Special Waste Regulations SI 1996 /972) apply.

Standing orders
The self-imposed rules within which a local authority carries out its business. Standing orders are set or confirmed on an annual basis by a vote of the full council membership (ie all the councillors within a local authority).

Statutory nuisance
Nuisance caused by a company or individual which can be acted against in law.

Unitary Authority
A local authority which encompasses the functions both of County Council and District Council.

Venting
The practice of allowing landfill gas to escape from a landfill into the atmosphere under control through a gas collection system. Active venting involves the use of pumps or fans to remove gas.

Waste Collection Authority, WCA
That part of a local authority which organises waste collections. They may also draw up recycling plans.

Waste Disposal Authority, WDA
That part of a local authority which organises waste disposal.

Waste hierarchy
A ranking of the preferred ways of reducing production of, recycling or disposing of waste.

Waste management licence, WML
A licence issued by the Environment Agency under the Environmental Protection Act 1990, permitting the holder to handle, store or dispose of controlled wastes, and defining the conditions under which those activities should be carried out.

Waste Regulatory Authority
Responsible for regulation of waste management facilities before their amalgamation, along with Her Majesty's Inspectorate of Pollution and the National Rivers Authority, into the Environment Agency.