

**Sheffield 'Energy Recovery Facility'
Planning Application**

Review and Objections

by

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for

GREENPEACE

Town and Country Planning Act 1990

Application by

Onyx Sheffield/ Sheffield Environmental Services

LPA Ref. No.: 01/10135/full

1. Introduction

1.1 This report presents objections on behalf of Greenpeace UK following an initial review of an application for a 225,000 tpa 'Energy Recovery Facility' (a 'mass burn' incinerator) made by Terence O'Rourke PLC as agents for Sheffield Environmental Services Ltd – a subsidiary company of Onyx.

1.2 The key objections Submission include:

- The proposal does not represent the 'Best Practicable Environmental Option' (BPEO) for the waste stream in Sheffield and is very likely to conflict with options higher up the hierarchy.
- The proposal increases the levels of nitrogen dioxide pollution in an area of Sheffield that is to be designated as an Air Quality Management Area because it is likely to fail to meet the health based air quality targets required by the Government. Sheffield City Council is the body responsible for the achievement of those targets and refusing this application is likely to make a larger contribution to achieving their duties in relation to better air quality than any other single action available to the authority.
- The application is premature. In particular it is premature in the absence of:
 - firm proposals to achieve the statutory recycling targets set under 'Best Value' and the longer-term targets set in the Waste Strategy 2000.
 - Public consultation on, and final approval of, the Municipal Waste Management Strategy for Sheffield
 - the advice from the Regional Technical Advisory Body being incorporated in the Regional Planning Guidance
- There are significant uncertainties that remain about the potential health and environmental impacts of locating a large incinerator at this site. Uncertainties remain over the existing levels of pollution.
- There are inadequacies in the data provided in the Environmental Statement supporting the application – particularly in relation to health impacts. However it can be seen that using the exposure response factors developed by COMEAP and the methodology used by the DETR in their Regulatory and Environmental Impact Assessment of the Waste Incineration Directive indicates that just the emissions of oxides of sulphur, oxides of nitrogen and particulates over the operational life of the

proposal could be responsible for about 9 deaths, 12 respiratory hospital admissions. It could also be expected that these emissions would result in about 700 GP visits over the operational life. These are based on acute impacts alone. Insufficient data has been provided by the applicant to allow quantification of the chronic impacts or a site specific assessment of the exposure response impacts using more recent data than the 1998 COMEAP but the total impacts are likely to be higher than those outlined above.

- There is significant and well founded public and commercial concern about the application. These concerns are based on the increasing body of knowledge that has become widely available about the potential impacts of emissions from incinerators and the high profile of incineration in political debates - with both major opposition parties taking positions against incineration for reasons including health concerns. Several local authorities and the National Assembly for Wales now have moratoria or 'presumptions against' incineration. The high level of public concern in relation to this application is not only material in its own right but is often supported by the scientific literature.

1.5 This report details just some of the concerns and uncertainties associated with the proposal. All are material and - particularly in the light of the conclusions of the Environment Transport and Regional Affairs Committee on 21st March 2001 they should be given significant weight if a truly sustainable system of waste management is ever to be developed in Sheffield.

1.6 It had been anticipated that the IPPC application would have been available during the review of the planning application. The planning Supporting Statement, for example, indicates that this would have been submitted in November. It seems that the submission of that application was delayed. In spite of repeated requests to the Environment Agency no copy has yet been provided. It is important to see the more technical data that this should include before completing the emissions section. We will therefore submit a final supplementary report on incineration emissions, ash disposal, CHP emissions and health impacts after the IPPC data has been made available.

1.7 In these circumstances and for the reasons outlined in this report I would recommend that the application should be refused.

Alan Watson C.Eng January 2002

2 The Planning and Legislative Framework

“We should never forget that decisions on matters like planning, or transport, or housing are ultimately about the quality of life of communities and individuals. Past mistakes happened when decision makers lost sight of that. We have to take decisions at the right level, and find ways to enable people to play a part in finding ways forward for their own communities.”

*Sustainable Development: Opportunities for Change
Consultation Paper on a Revised UK Strategy, DETR 1998,*

- 2.1 This chapter outlines the key elements of the legal framework as it relates to the planning decision.
- 2.2 Many of the relevant legal duties derive originally from European Directives and although these have generally been transposed effectively it is helpful to look at the requirements of the Directives as they provide the source material for the UK legislation.

The Waste Framework Directive

- 2.3 Perhaps the most important of the European Directives in relation to the determination of this application is the Waste Framework Directive (75/442/EC as amended by 91/156/EC). This Directive introduces stringent requirements for the protection of human health and the environment that have significant implications for this proposal. In particular Article 4 of the Directive is highly relevant (but was ignored by the Applicant in the Environmental Statement) and provides as follows:

“Member states shall take the necessary measures to ensure that waste is recovered or disposed of without endangering human health and without using processes or methods which could harm the environment, and in particular:

- *without risk to water, air, soil and plants and animals;*
- *without causing a nuisance through odours;*
- *without adversely affecting the countryside or places of special interest”.*

- 2.4 The duty is transposed into UK legislation by Schedule 4 Paragraph 2(1) and (4) of the Waste Management Licensing Regulations 1994. The Waste Management Licensing Regulations required that Sheffield City Council –

must ensure that these objectives are achieved when taking the specified action in determining the application for planning permission¹. The Waste Management Licensing Regulations require that the planning functions are discharged 'with' the objectives. This is a stringent - and arguably even absolute- duty². At the least then the duty should be interpreted as a requirement to use the process which presents the least 'hazard'. If there is no 'hazard' then 'risk' is eliminated - this removes the uncertainties associated with the mathematical (and historically unreliable) 'risk assessment' approach adopted by the appellant.

2.5 A "relevant objective" for the planning authority in connection with the "specified action" of "determining an application for planning permission" in relation to the disposal or recovery of waste [also Sch.. 4 paras 1, 2(1) and 3].

2.6 Circular 11/94 Annex 1 para.. 1.47 requires that:

"The general duty in paragraph 2(1) [of Schedule 4 to the 1994 Regulations] means that in exercising the specified functions authorities must always consider the objectives of the Directive and aim to determine decisions in line with them" [emphasis added]

2.7 Therefore unless the planning authority can be sure that there are no risks - or at least no more than de minimis risks - to these environmental objectives then they are justified in refusing to grant planning permission.

2.8 There is an exception providing that the planning authority is not **required** to deal with any matter which a pollution control authority has power to deal with (para.. 2(2)); However this does not in any way restrict the scope of the planning authority to exercise its discretion to include those issues. In the case of the Sheffield incinerator proposal the majority of the objectives must be discharged at the planning stage as part of the Environmental Impact Assessment in any case.

¹ Waste Management Licensing Regulations, Schedule 4, Paragraph 3, Table 5

² It is important to distinguish the judgements of Harrison J in R v Environment Agency ex parte Leam and R v Environment Agency ex parte Gibson, High Court, May 8 1998 and Schiemann J in R v Bolton MBC ex parte Kirkman, Court of Appeal May 5, 1998. The former characterised it as a duty to consider the objectives. The latter characterised it as a duty to "have them in mind" or have regard to them or alternatively that they were considered. It is plain from the wording of Article 4 and the reference to "ensure" and Schedule 4 paragraph 2(1) Waste Management Licensing Regulations and "discharging functions" that the duty is a mandatory one going beyond the language of materiality in these judgements. The Article 4 duty has also been the subject of the High Court and Court of Appeal judgements recently in the case of R v Bolton MBC ex parte Kirkman, High Court [1998] J.P.L 787 and Court of Appeal [1998] J.P.L 802.

2.9 Article 3 of the Directive, as clarified by DG Environment, requires that appropriate measures are taken to encourage

“(i) the recovery of waste by means of recycling, re-use or reclamation or any other process with a view to extracting secondary raw materials or

(ii) the use of waste as a source of energy”

Emphasis is given to recycling and re-use in accordance with the Waste Hierarchy and BPEO rather than to energy recovery

2.10 The hierarchy for the treatment of bio-waste has also recently been clarified by DG Environment in the working document for the biological treatment for bio-waste (the emerging ‘Composting Directive’³. This working document defines biowaste as:

‘biowaste (biodegradable waste)’ means any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, and paper and paperboard;

2.11 That is the element of the waste stream that it is required to divert from landfill sites by the ‘Landfill Directive’ and represents between 68% and 70% of the Sheffield household waste stream⁴:

Table 4.7 Biodegradable waste within kerbside collected household (dustbin) waste

Primary category	Biodegradables					
	January %	January kg	June %	June kg	Year %	Year kg
Paper and card	26.4	3.3	21.1	3.3	22.2	3.3
Textiles	1.2	0.2	0.6	0.1	0.7	0.1
Misc. Combustible	5.0	0.6	6.1	1.0	5.9	0.9
Misc. non-combustible	0.2	0.0	2.0	0.3	1.7	0.2
Putrescibles	31.8	4.0	37.5	6.0	36.3	5.5
Fines	3.6	0.5	2.4	0.4	2.6	0.4
Total	68.1	8.6	69.8	11.1	69.5	10.5

2.2

2.13 The hierarchy listed by DG Environment in the working document is:

An improved management of biowaste in the Community should encourage, in this order:

(1) the prevention or reduction of biowaste production (e.g. sewage sludge) and its contamination by pollutants,

³ Brussels, 12 February 2001 DG ENV.A.2/LM/biowaste/2nd draft

⁴ Draft Sheffield Municipal Waste Strategy

- (2) *the reuse of biowaste (e.g. cardboard),*
- (3) *the recycling of separately collected biowaste into the original material (e.g. paper and cardboard) whenever environmentally justified,*
- (4) *the composting or anaerobic digestion of separately collected biowaste, that is not recycled into the original material, with the utilisation of compost or digestate for agricultural benefit or ecological improvement,*
- (5) *the mechanical/biological treatment of biowaste,*
- (6) *the use of biowaste as a source for generating energy.*

2.14 It is notable that the Onyx planning application does not make any reference to mechanical/biological treatment of biowaste even though it ranks above energy recovery in the hierarchy.

2.15 Mechanical/biological treatment (MBT) is defined by DG Environment as:
'mechanical/biological treatment' means the treatment of residual municipal waste, unsorted waste or any other biowaste unfit for composting or anaerobic digestion in order to stabilise and reduce the volume of the waste;

2.16 The most recent publication by the Commission⁵ shows that MBT also gives benefits in relation to climate change and greenhouse gas generation compared with landfill and incineration. It says:

The study has shown that overall, source segregation of MSW followed by recycling (for paper, metals, textiles and plastics) and composting /AD (for putrescible wastes) gives the lowest net flux of greenhouse gases, compared with other options for the treatment of bulk MSW. In comparison with landfilling untreated waste, composting / AD of putrescible wastes and recycling of paper produce the overall greatest reduction in net flux of greenhouse gases. The largest contribution to this effect is the avoidance of emissions from landfills as a result of recycling these materials. Diversion of putrescible wastes or paper to composting or recycling from landfills operated to EU-average gas management standards decreases the net greenhouse gas flux by about 260 to 470 kg CO₂ eq/tonne of MSW, depending on whether or not the negative flux credited to carbon sequestration is included.

2.17 The benefits of MBT and recycling compared with incineration are increased when the electricity generation displaced by incineration are included "*within a member state's target for renewable energy – as is the case in the UK*".

⁵ Waste management options and climate change, European Commission, December ISBN 92-894-1733-1

Council Directive 97/11/EC on Environmental Assessment

2.18 The proposed incinerator is an EIA development for the purposes of Council Directive 97/11/EC and for the purposes of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 SI 1999 No.293.

2.19 Article 3 of Council Directive 97/11/EC states that;

“The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case and in accordance with Articles 4 to 11, the direct and indirect effects of a project on the following factors:

- human beings, flora and fauna...”

2.20 Paragraph 3 of Part 1 of Schedule 4 to the 1999 Regulations which purportedly transposes Article 3 of the Council Directive requires:

“A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population...”

2.21 Whilst Paragraph 4 of Part 1 of Schedule 4 states that such description as required by Paragraph 3 should cover;

“...the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development resulting from:

(a) the existence of the development;

(b) the use of natural resources;

(c) the emission of pollutants, the creation of nuisances and the elimination of waste

2.22 It is therefore clear that both the Council Directive and the UK Regulations regard human beings as an integral part of the environment and it follows that any likely significant effects on populations should be assessed as part of the EIA process.

2.23 It is also clear that the obligation to provide relevant environmental information falls upon the developer, and not upon any other body. Unless Sheffield City Council (or the Secretary of State on appeal after a refusal) have first taken into consideration the environmental information planning permission shall not be granted (Regulation 3(2) 1999 Regulations).

2.24 In this case the Environmental Statement contains very limited relevant information on likely significant effects on human beings. Particular omissions include:

- No assessment of the effects of the proposal on respiratory diseases using the COMEAP and Kunzli factors (see below).
- No assessment of the effects of ozone generated at some distance from the incinerator as a result of NOx emissions
- Only a limited range of emissions have been considered in the risk assessment
- No reference is made to any of the epidemiological evidence of harm from incineration.
- Health based air quality standards for nitrogen dioxide are already exceeded around the incinerator but the impacts of this are not assessed
- No information is included on techniques which are available and in use throughout Europe and which would reduce the impacts of the proposed incinerator such as continuous monitoring of dioxin emissions and selective catalytic reduction (SCR) of emissions.

2.25 The obligations arising from Article 4 of the Waste Framework Directive do not only bite on the Planning Authority. The Environment Agency also has obligations arising from Article 4 but the Planning Authority, as above must consider the health implications where they are material. Furthermore the duties on the Environment Agency do not relieve the promoters of the proposed incinerator from the obligations imposed upon them by virtue of the EIA Directive and Regulations.

2.26 In these circumstances unless and until Onyx has fully complied with the EIA Directive and Regulations no lawful grant of planning permission can be made in respect of this proposal.

2.27 It is further clear that the epidemiological data together with the concerns already expressed by the major political parties and the Minister (as described below) have significant bearing as to whether this proposal should be called-in for a full public inquiry. In our view the issues raised by the Onyx proposal satisfy the criteria to justify a call-in.

The Waste Incineration Directive

2.28 Comprehensive pollution control of municipal waste incineration was only achieved in the UK as a result of two 1989 Directives. These were Directives 89/369/EEC on the prevention of air pollution from new municipal waste incineration plants and 89/429/EEC on the reduction of air pollution from existing municipal waste incineration plants. The effect of these Directives was that the existing UK incinerators, operating under

integrated pollution control, were forced to upgrade to 'new plant standards' or to close by 1st December 1996.

- 2.29 The regulatory history of incineration has given rise to some of the concerns detailed in the following chapters. The predecessor of the Environment Agency, Her Majesty's Inspectorate of Pollution allowed the old, and often very polluting, incinerators to operate up to the deadline set by the Directive without even setting dioxin emission limits. It has been known since 1977/78 that incinerators are important sources of dioxins but it took until 1996 for limits to be included in IPC authorisations for UK incinerators – and then only after the Directive required it. These 'old' incinerators caused widespread dioxin and other contamination⁶ and continual criticisms from residents over emissions. Their extended operations in spite of these complaints have reduced the public confidence in the Environment Agency to adequately protect their interests.
- 2.30 Although the Sheffield Incinerator was upgraded at a cost of around £ 29 million since 1996 it has consistently failed to comply with the standards required even by the 1989 Directive and will certainly not be able to meet the new Waste Incineration Directive Standards.
- 2.31 It is often said that 'if the incinerator does not meet the conditions of the authorisation then the Environment Agency would force it to close down'. However no 'modern' incinerator has been able to comply fully with the conditions set in the Integrated Pollution Control (IPC) authorisations nor with the requirements of the current Directive. Nonetheless the Environment Agency has not required that any of these plants be closed. Legal action was only taken against Sheffield after repeated failure to comply with an enforcement notice – and incinerator is still being allowed to continue operating in spite of an appalling record of compliance.
- 2.32 Another example in the north east is the Byker incinerator which has been operated and regulated under the current Directive but that has not prevented serious environmental pollution from the plant. This has caused severe damage to public confidence in the regulatory regime – operating, as it did, until 1999. ENDS⁷ reported:

⁶ For example Huddersfield – allowed to operated under IPC in spite of objections from MAFF , Hampshire and Bolton plants which caused significantly elevated dioxin levels. ~The data in the Environmental Statement about dioxin contamination in Sheffield is a cause for concern about possible historic pollution from this plant.

⁷ ENDS MAY 2000, Issue No. 304 'Regulatory foul-ups contributed to Byker ash Regulatory foul-ups contributed to Byker ash affair'

“Ash from a refuse-derived fuel (RDF) incinerator in Newcastle which was spread on local allotments and paths over a six-year period has been removed after the discovery that it was heavily contaminated with dioxins and heavy metals. The incinerator operator and city council have borne the brunt of criticism over the affair - but regulatory failures by the Environment Agency and its predecessor, HM Inspectorate of Pollution (HMIP), also made a substantial contribution. (my emphasis)

2.33 Standards set in the 1989 Directive and applied to existing plant from 1st December 1996 will have to be tightened again in order to achieve compliance of a new EC Directive on Incineration. A common Position, (EC) no 7/2000, on the (then) draft Directive has been agreed and adopted by the Council on 25th November 1999. The Common Position and Statement of the Council’s reasons was published in the Official Journal on 28th January 2000⁸.

2.34 Agreement on the final text of the Directive was reached by Council and the Parliament in July 2000. The Directive came into force on 28th December 2000.

The Integrated Pollution Prevention and Control Directive (96/61/EC)

2.35 The proposed Incinerator does not have an Integrated Pollution Prevention and Control authorisation. This will be determined by the Environment Agency independently of the planning application. It is notable that the Environment Agency has never refused to issue an IPC or IPPC permit for municipal waste incineration (and only extremely rarely for any process) as they expect the ‘in principle’ decisions to be taken at the planning stage. It is also important to recognise that there is no in-house expertise in health issues – instead the Environment Agency has a protocol with the Department of Health for the provision of advice. This is rarely used.

2.36 Unfortunately the Environment Agency in the IPPC authorisations issued to date seems content to use the minimum standards required by the Directive as representing ‘Best Available Techniques’ (BAT). Clearly this is not the case. For nitrogen dioxide emissions, for example, Dutch standards were set in the early 1990’s at about a third of the level required by the Directive (70 mg/m³ vs. 200 mg/m³). The Sheffield incinerator is only proposed to comply with the higher 200 mg/m³ standard.

⁸ C25/17-25/44

National Policy and Guidance

The National Waste Strategy

- 2.37 The national framework for waste management is set out in Government's National Waste Strategy (Waste Strategy 2000 England and Wales), which was published in May 2000. The strategy sets out a framework by which waste should be managed in the UK in order to meet its obligations under the EC Landfill Directive, and to fulfil the Government's objectives of sustainable development. As well as setting new targets, the strategy provides a useful summary of the obligations, initiatives and instruments in place or proposed which will lead to the phasing out of landfill.
- 2.38 The technique of Best Practicable Environmental Option (BPEO) is central to the strategy and should be used to consider the relative merits and disadvantages of waste management options. The strategy emphasises (paragraph 3.4) that BPEO should establish "*the option that provides the most benefits, or the least damage to the environment as a whole, at acceptable cost, in the long term as well as the short term*". It is also stated that the waste hierarchy should be used as a guide for ranking waste management options as part of a BPEO assessment. There was no assessment of BPEO in the environmental statement accompanying the Onyx application.
- 2.39 The advocated waste management priorities are to first minimise and re-use waste (paragraph 2.8 - 2.13) followed by recycling and composting. The latter option, although promoted as a secondary option (paragraph 2.14 - 2.18), is considered to be integral to a sustainable system of waste management.
- 2.40 Waste Strategy 2000 promotes a Hierarchy where recycling is above energy recovery:
- "2.19 Where it does not make sense to recycle waste, consideration should be given to using it as a fuel"*
- "2.23 Energy from waste plant should be appropriately sized and care must be taken to ensure that contracts are sensitively designed to avoid 'crowding out' recycling."*
- "4.5 ...within the hierarchy, the Government and the National Assembly do not expect incineration with incineration with energy recovery to be considered before the opportunities for recycling and composting have been explored"*
- 2.41 This is consistent with the approach adopted by DG Environment and the European Commission as outlined above.
- 2.42 Only if the first two options are deemed to be unsuitable and recycling waste does not represent the most suitable option, should the waste be

considered for energy recovery. The current application falls well short of that test. However, the strategy is clear that such facilities should be designed so as not to prejudice the incentives for recycling

2.43 A further aspect of the strategy is the "precautionary principle", which should be taken into account when considering standards of environmental performance (paragraph 3.2). In the light of scientific uncertainty, the precautionary principle is a means to safeguard public health. The European Commission advice is that the precautionary principle should be applied where⁹ *"there are reasonable grounds for concern that potential hazards may affect the environment or human, animal or plant health, and when at the same time the lack of scientific information precludes a detailed scientific evaluation"*

2.44 The Council of Ministers agreed a less restrictive formulation of the Precautionary Principle at their Meeting in December 2000 in Nice. This extends the EU Treaty and should take precedence over the UK formulation in Waste Strategy 2000.¹⁰.

⁹ European Commission Communication on Precautionary Principle, 2 February 2000

¹⁰ The Nice resolution says the Precautionary Principle should be applied:

"where the possibility of harmful effects on health or the environment has been identified and preliminary scientific evaluation... proves inconclusive for assessing the level of risk". Note that unlike the Rio formulation, this explicitly includes health and does not require a threat of *"serious or irreversible damage"*.

The resolution does bring in "account of social and environmental costs" in examining the level of risk, but not in the strong form of Cm4345 ("must be based on objective assessments of the costs and benefits of action"). Indeed, the resolution says that

"the protection of public health, including the effects of the environment on public health, must be given priority".

The European Environment Agency has recently reviewed the precautionary principle in a historical context and makes the following recommendations:

1. Acknowledge and respond to ignorance, as well as uncertainty and risk, in technology appraisal and public policymaking.
2. Provide adequate long-term environmental and health monitoring and research into early warnings.
3. Identify and work to reduce 'blind spots' and gaps in scientific knowledge.
4. Identify and reduce interdisciplinary obstacles to learning.
5. Ensure that real world conditions are adequately accounted for in regulatory appraisal.
6. Systematically scrutinise the claimed justifications and benefits alongside the potential risks.
7. Evaluate a range of alternative options for meeting needs alongside the option under appraisal, and promote more robust, diverse and adaptable technologies so as to minimise the costs of surprises

2.45 The Strategy (paragraph 5.62), under a section titled "Ensuring Safer Waste Incineration", notes that pollution is an issue of vital importance and that people have every right to demand the highest standards from all waste management facilities.

2.46 The Minister has recently made it absolutely clear that there is no obligation on a waste planning authority to include incineration in any Waste Local Plan or strategy. Furthermore the Minister went further in relation to Waste Local Plans¹¹:

Mr Bob Russel:The Minister told me in a written answer that there is no legal requirement for county councils to include incinerators in their waste plans. However, Conservative- controlled Essex county council is proceeding with incinerators in its plan because it claims that that is a legal requirement. We need clarification.

Mr Michael Meacher:The hon. Member for Colchester asked about the position on incinerators, and I have made that very clear. He also asked whether there is a legal requirement to include incineration. There is absolutely no such legal requirement.

2.47 Even more recently the Minister¹² has also clarified that he does not believe that the use of incineration is essential to meet the targets but only that it 'may' be required 'where options further up the waste hierarchy do not provide the Best Practicable Environmental Option':

and maximise the benefits of innovation.

8. Ensure use of 'lay' and local knowledge, as well as relevant specialist expertise in the appraisal.

9. Take full account of the assumptions and values of different social groups.

10. Maintain the regulatory independence of interested parties while retaining an inclusive approach to information and opinion gathering.

11. Identify and reduce institutional obstacles to learning and action.

12. Avoid 'paralysis by analysis' by acting to reduce potential harm when there are reasonable grounds for concern.

(from Late lessons from early warnings: the precautionary principle 1896–2000 European Environment Agency, Environmental issue report No 22 Luxembourg: Office for Official Publications of the European Communities 2001 – 210 pp. ISBN 92-9167-323-4
http://reports.eea.eu.int/environmental_issue_report_2001_22/en/Issue_Report_No_22.pdf)

¹¹ Hansard 11 Dec 2001 : Column 809

¹² Hansard Written answers 14 January 2002

Bob Spink: To ask the Secretary of State for Environment, Food and Rural Affairs (1) what discussions she has had with local authorities on the exclusion of incineration from local waste plans; and if she will make a statement; [5470]

(2) if she will change her policy to allow county councils to specifically exclude incineration in their waste plans. [5469]

Mr. Meacher [holding answer 20 July 2001]: The Government have had no such discussions with local authorities. Although Government policy seeks to encourage waste minimisation and to maximise the scope for recycling wherever possible, in those cases where options further up the waste hierarchy do not provide the Best Practicable Environmental Option (BPEO), some incineration capacity may be needed in order to achieve the landfill diversion targets under the Landfill Directive.

2.48 In the absence of any BPEO assessment for this proposal then Sheffield City Council cannot be satisfied that these criteria have been fulfilled.

Best Value

2.49 As announced in *Waste Strategy 2000*, the Government has set statutory performance standards for household waste recycling and composting for 2003/04 and 2005/06. The Local Government (Best Value) Performance Indicators and Performance Standards Order 2001 was laid before parliament in March 2001.

2.50 The standards apply to the total of indicators BV82a (total tonnage of household waste – percentage sent for recycling) and BV82b (total tonnage of household waste – percentage sent for composting). The overall impact of these standards will be to raise national recycling rates to at least 17% in 2003/04 and at least 25% in 2005/06.

2.51 Some amendments to the interpretation of these indicators have been made since they were published in *Best Value Performance Indicators 2001/2002*, December 2000, and an important correction to BV82c (total tonnage of household waste – percentage used to recover heat and power) has been necessary in order to disqualify incinerator residues from counting towards these targets.

2.52 Standards are based on the recycling rates calculated from returns for the year 1998/99. The relevant waste recycling performance indicators for Sheffield, which supersede those published in *Best Value Performance Indicators 2001/2002*, are:

1998-99	2003-04	2005-06
5 %	10 %	18 %

- 2.53 The poor recycling performance of Sheffield to date means that the targets set are very low – indeed no English authority has a lower target. It is notable that host boroughs of the existing Onyx incinerators are also amongst the worst recycling performers. There are, by contrast, 85 authorities for example, with a requirement to recycle at least twice as much waste as Sheffield by 2005-6. Eighteen authorities have been set targets of 40% recycling by that year.
- 2.54 The recycling rate for Sheffield can be compared with the London Borough of Sutton which had achieved more than 35% recycling by early 2001 and hoped to reach 50% by the end of the year. Sutton has set a recycling target of 80% by 2005¹³.
- 2.55 Notwithstanding the current low targets for Sheffield the setting of statutory Best Value recycling targets of 40% to be achieved within four years shows that the Government clearly believes that these targets are reasonable and achievable. There is no reason to believe that they could not be achieved in Sheffield given the will and the right management.
- 2.56 The Minister¹⁴ has recently clarified the position of possible threats to the achievement of recycling targets set under Best Value:
- Mr. Meacher: The requirement in our policy is that statutory recycling targets must be met and that no incineration proposal shall be permitted which will pre-empt recycling or reduce the option of recycling for the future. A local authority may be able to demonstrate that it can achieve those targets consistent with small-scale incineration, preferably linked with combined heat and power. Although I do not rule out such proposals, I do not think that there will be many such examples. The Government's proposal is to increase recycling to the fullest degree to which it is environmentally the best option.*
- 2.57 The emphasis is clearly that any incinerators which are consistent with Government Policy would be small scale and not reduce any future recycling options.

¹³ See, for example, **New moves to improve Sutton's environment agreed** PR01/80 25 April, 2001 <http://www.sutton.gov.uk/council/press/2001/pr0180.htm> :

“The Best Value review identified particular areas where Sutton stands out beyond the minimum requirements of central Government.

These include its target of recycling 80 per cent of household waste by 2005, believed to be the highest target in Britain. Sutton is currently among the top London boroughs in the amount of household waste it recycles or composts, expected to reach 50 per cent by the end of the year.”

¹⁴ Hansard 11 Dec 2001 : Column 806

2.58 It is difficult to reconcile the views being presented by the Chief Executive of Sheffield City Council¹⁵ that “in his view, there would be no further financial assistance from the Government to this process which could prove to be prohibitively expensive.” With those of the Minister.

2.59 In particular the Minister¹⁶ has made it clear that the drive towards recycling will receive significant additional funding:

Ms Shipley: To ask the Secretary of State for Environment, Food and Rural Affairs if she will make a statement on the progress of the waste management strategy. [18011]

Mr. Meacher: Since launching the national waste strategy in May last year the Government have set demanding statutory targets for the recycling and composting of household waste for each local authority, increased the landfill tax and consulted on a system of tradeable landfill permits in order to achieve the diversion from landfill required. It has also set up the Waste and Resources Action Programme to help create stable and efficient markets for recycled materials and products, with funding from the Government and the devolved Administrations of around £ 340 million over three years.

Extra funding has been made available to enable waste authorities to meet the Statutory Performance Standards for recycling and composting that are now in place. Spending Review 2000 included an increase of £ 1.1 billion by 2003-04 over 2000-01 provision as well as the provision of other sources of funding including the ring-fenced fund of £ 140 million specifically for recycling and £ 220 million of PFI funding for waste projects. The Government are currently in consultation with local authorities on the best way to distribute the £ 140 million fund. copies of the consultation paper are available on the DEFRA website at www.defra.gov.uk/environment/consult/wastefund/index.htm.

2.60 It seems that whatever ‘BPEO’ assessment may have been carried out internally as part of the contract process it has not been particularly well informed about the support for facilitating increased recycling.

¹⁵ Sheffield Cabinet Minutes 2nd July 2001
http://www.sheffield.gov.uk/townhall/Committee_Secretariat/Cabinet/Minutes/20010702.htm

¹⁶ Hansard Written answers 14 January 2002

Planning Policy Guidance

PPG 10 - Planning and Waste Management

- 2.61 PPG10 (September 1999) updates the guidance contained in PPG23 (Planning and Pollution Control) and replaces the parts of PPG23 that specifically deal with waste management issues. It needs to be considered alongside Waste Strategy 2000.
- 2.62 PPG10 provides advice on how the land use planning system should contribute to sustainable waste management through the provision of waste management facilities. It does not favour a particular waste management option and states that this should be a matter for individual waste planning authorities (WPAs). It states that decision-making should be informed by the national waste strategy and consideration of the BPEO (paragraph 3).
- 2.63 Paragraph 6 stipulates that waste management decisions should be based on four principles. These are: BPEO, Regional self sufficiency (that most waste should be treated or disposed of within the region in which it is produced), the proximity principle and waste hierarchy. The latest position of the Government regarding these principles is described in the draft waste strategy.
- 2.64 Paragraph 39 states that *"the planning system should enable adequate provision to be made for waste management facilities in appropriate locations, without undue adverse environmental effects or nuisance"*. The guidance (paragraph 41) recognises that the effects of waste management facilities on other land may be material considerations at the development control stage. These may include, inter alia, proximity to other development, impacts of amenity (PPG23, Planning and Pollution Control paragraphs 1.32 - 1.33) and transportation (PPG13, Transport). It states that advice on possible material considerations in connection with potentially polluting developments is currently contained in paragraph 3.2 of PPG23.
- 2.65 Finally, paragraph A11 outlines factors that are appropriate to the consideration of waste management proposals including traffic, odours, visual intrusion and compatibility with adjacent development and paragraph A55 advises that *"full and continuous consultation with the local host community is highly advisable before proposals are approved"*.
- 2.66 Any claim that this guidance was being applied would be more credible if Sheffield City Council had not waited until the planning application for a 225,000 tpa incinerator - with a 30 year contract and taking upto 94% of the household waste - had been submitted before this October 2001 draft report was put to a December committee to start a consultation process on

waste management options! In these circumstances any real choice is severely constrained and this reinforces the prematurity arguments against this proposal.

PPG23 - Planning and Pollution Control

- 2.67 This section summarises the relevant provisions PPG23 and, in particular, the advice on what may be material considerations in the determination of planning applications, including proximity to other development or land use which may be affected, the sensitivity of the area and the loss of amenity that pollution may cause. It also refers to PPG23 which indicates that the local planning authority may still consider a development that satisfies pollution control requirements presents an unacceptable risk in planning terms; that the perception of risk can be material to the consideration of the planning application where the land-use consequences of such perceptions can be clearly demonstrated; and permission may have to be refused where such consequences are considered unacceptable and cannot be overcome. The position set out in PPG23 has been clarified and developed by case law, which is considered later in this submission.
- 2.68 PPG23 (July 1994) provides guidance on the relevance of pollution controls to the exercise of planning functions in England. However, some aspects of PPG23 have been replaced by PPG10 (see above).
- 2.69 The guidance (paragraph 3.1) is clear that decisions on planning applications for developments which may give rise to pollution, like all planning decisions, must be made in accordance with the development plan, unless material considerations indicate otherwise. Material considerations may include (paragraph 3.2):
- the availability of land for potentially polluting development taking into account its proximity to other development or land use, which may be affected
 - the sensitivity of the area, in particular in relation to certain interests
 - the loss of amenity that pollution could cause
 - any particular environmental benefits such as the regeneration of derelict land or transport improvements.

2.70 PPG23 states¹⁷ that in assessing the risk from pollution, planning authorities should consult the relevant pollution control authority and that “*planning authorities should work on the assumption that the pollution control regimes will be properly applied and enforced*”. Whilst the guidance advises that it should be assumed that the pollution control regime works effectively I consider that it must also be a material consideration that the evidence shows that this is not the case in practice and that “the Emperor is wearing no clothes”. Paragraph 1.34 continues:

“They should not seek to substitute their own judgement on pollution control issues for that of the bodies with the relevant expertise and the statutory responsibility for that control”.

2.71 The conflict between the idealised aspirations of the guidance and the harsh reality of the ‘real world’ implementation presents a dilemma for the planning authority. In these circumstances it is suggested that the most appropriate, relevant and reliable evidence as to the potential land use implications must be how the system operates in practice. The failures of the pollution control regime will, at best, add to the perception of risk faced by the public – and that is material in itself as described below.

2.72 It is reasonable that the pollution control authority should deal with the technical aspects of a proposal which do not have land use implications however the guidance says that the “dividing line between planning and pollution control is not always clear cut” and in the case of , for example, the level of emissions from the proposed incinerator there are undoubtedly land use implications. Similarly if a technology is available that would produce lower emissions but is not proposed as part of the application then that also should be material to the planning decision.

2.73 Even if a development satisfies the requirements of pollution control legislation, it does not preclude the planning authority from having regard to other pollution related considerations. These include the amenity impacts of pollution or the perception of risk that may still affect the quality of life of local residents because of their lack of confidence in the ability of the pollution control regime to protect their health.

2.74 Furthermore nothing that the Environment Agency does can relieve the planning authority of the responsibility to carry out a proper environmental assessment as noted above. The Environmental Assessment process required by the Town and Country Planning (Environmental Impact Assessment)(England and Wales) Regulations

¹⁷ Para 1.34

1999¹⁸ requires that pollution and air quality issues are fully considered by the planning authority. The response of the pollution control agencies (Environment Agency, Environmental Health Authority etc.) constitute only part of the environmental information the planning authority needs to take into account, which includes the responses of consultees and other third parties.

- 2.75 Although the provisions of PPG23 (paragraph 2.9) relating to the implementation of the European Waste Framework Directive have been replaced by PPG10, the obligations on Waste Planning Authorities under Article 4 of the Directive - to ensure that waste is recovered or disposed of without endangering human health and without using processes or methods which could be harmful to the environment - remain, under the provisions of the Waste Management Licensing Regulations 1994.

RPG 12: Regional Guidance for Yorkshire and the Humber

- 2.76 The revised version of RPG 12: Regional Guidance for Yorkshire and the Humber was published on 31st October 2001.

- 2.77 Although the guidance has been published very recently it says:

10.37 A co-ordinated regional approach to waste management in the context of PPG10 needs to be developed and further work is required to feed into an early review of RPG. A Regional Technical Advisory Body should be established to assemble relevant data and provide advice on options, strategies and targets to the Regional Assembly. This needs to be done as a matter of urgency in view of the need to meet the targets set in the national waste strategy and so that it can be integrated into an early review of RPG

- 2.78 The advice of the RTAB has not, therefore, been incorporated into the Regional Guidance. As this application, if approved, would largely determine the fate of the majority of the Sheffield MSW waste stream for 30 years then it must be seen as premature to proceed with such a scheme in advance of the RTAB being established.

- 2.79 In relation to air quality the RPG emphasis is particularly relevant to this application:

10.44 Air quality is an important influence on the quality of life in the region.....Local authorities should therefore ensure that the land use planning system makes an appropriate contribution to the achievement of national air quality objectives. They should also ensure that air quality considerations are

¹⁸ SI 1999No 293

properly considered along with other material considerations in the planning process, particularly so where AQMAs have been designated.

- 2.80 The RPG does not include a separate policy on air quality. Rather it says that the relevant spatial issues are dealt with in various policies and indicator/targets. However it is suggested that *“in the next review of RPG further consideration should be given to whether there are any regionally specific air quality issues that need to be addressed by a specific policy”*.
- 2.81 A proposal for incineration of the vast majority of the household waste stream for at least 25 years must, again, be considered premature in advance of the RTAB review and the inclusion of waste specific proposal within the RPG – these may include, for example, the development of regional reprocessing facilities for collected recyclate such as paper mini-mills etc which could dramatically influence the prospects for cost effective high recycling strategies. Approval of this incinerator could fatally undermine such beneficial employment creating schemes.

Yorkshire Forward

- 2.82 The Yorkshire Forward report says:

*“We need many more knowledge-based, high value added businesses, particularly in South Yorkshire, as well as **industries capitalising on more sustainable approaches, such as recycling, waste minimisation and the development of new products and processes, with more emphasis, where appropriate, on local sourcing and short supply chains.**” (my emphasis)*

- 2.83 Incineration is not a ‘new product or process’. Mass burn incineration, in particular, is a technology that is increasingly being rejected in progressive societies (and even by the Scottish Environmental Protection Agency) and one that undermines the ‘more sustainable approaches’ supported by the strategy.

- 2.84 The ‘deliverables’ offered by the strategy include, inter alia,

“The region will take the following actions :

.....

*(g) promote **initiatives to make better use of natural resources** – in sectors like waste and recycling, energy, housing, agriculture, forestry and transport; and*

*(h) promote new developments in the region that are **exemplars of sustainable practice, setting minimum standards, making use of energy efficient and environmentally benign materials**”. (emphasis in the original)*

2.85 Again it is difficult to reconcile the incineration of the majority of the Sheffield municipal waste stream in a mass burn incinerator with these deliverables. The Environment, Transport and Regional Affairs Committee (ETRAC) conclusion in it's report 'Delivering Sustainable Waste Management'¹⁹ succinctly highlights the conflict in each of these cases :

"A waste stream is only 'sustainable' in the most twisted definition of the word since sustainable waste management has as its cornerstone the minimisation of waste, and the explicit maintenance of waste streams for the purposes of incineration is in complete contradiction of this principle."

2.86 Sheffield would inevitably fail to become an 'exemplars of sustainable practice' if this proposal is allowed to proceed. A maximum achievable recycling rate of 18-22% is already massively exceeded by progressive administrations. Already the whole of the USA recycles 50% more than this and the recycling rate that is proposed for Sheffield represents only about 25% of that achieved by the most progressive exponents of recycling.

Local Planning Issues

2.87 PPG 23 says²⁰ that, in accordance with s 54A²¹ of the Town and Country Planning Act 1990, "Decisions on planning applications for developments which may give rise to pollution, like all planning decisions, must be made in accordance with the development plan, unless material considerations indicate otherwise."

2.88 The supporting statement for this application claims:

"It has been confirmed by Sheffield City Council that Onyx's proposals are not considered to be a departure from the development plan, as they are not contrary to any other waste policies, and the site has existing use as an incinerator."

2.89 If this correctly reflects the position of Sheffield City Council then this conclusion is both premature in advance of full consideration of the application against the development plan policies and irrational as a

¹⁹ Environment, Transport and Regional Affairs Committee's Fifth Report on Delivering Sustainable Waste Management HC36-I 21st March 2001

²⁰ Paragraph 3.1

²¹ Inserted by the Planning and Compensation Act 1991

proper examination shows that there are conflicts with the development plan.

- 2.90 The main relevant local plan is the Sheffield Unitary Development Plan which was adopted in March 1998. The relevant policies include

Policy MW3: Waste Management

Policy MW4: Waste Disposal Facilities

Policy MW5: Waste Disposal Areas

Policy MW6: Recycling and Reclamation

Policy MW7: Environmental Impact of Mineral Working and Waste Disposal Operations

- 2.91 The full text of the policies are included in an Appendix.

- 2.92 When the current application is tested against these policies then it fails to meet the following requirements of MW 3:

When catering for waste materials, all recycling and disposal options will be examined so that:

(c) The best techniques and highest possible standards could be achieved at all times.

- 2.93 In particular this would require the Best Practicable Environmental Option for the management of waste to be used. This is not, as is detailed in the following chapters, an incinerator that would require the vast majority of the household waste stream as fuel. Furthermore even the emissions technology does not meet the requirements of the policy – the proposed emissions of Nitrogen Dioxide, particularly sensitive in the centre of Sheffield because of the existing air quality problems, are three times higher than Dutch standards which have been in force since the early 1990's – better technology is available to reduce these emissions but has not been proposed. Similarly the best practice for dioxin sampling is continuous monitoring using adsorption techniques which are in widespread use around Europe – this proposal would rely on only 12 – 18 hours sampling out of c 7,5000 hours operation. More details on these, and other, failures to comply with MW3 are detailed below.

3. Human Rights Issues

3.1 The Human Rights Act 1998 received Royal Assent on 9th November 1998 and came into force on 1st October 2000. The European Convention on Human Rights, which is implemented by the Act, was adopted in 1950 and came into force as an international treaty in 1953. The United Kingdom was an original signatory to the Convention.

3.2 It is not yet clear what the full implications of the Human Rights Act will be for the planning process when potentially hazardous processes are considered. There is, however, some relevant case law and the issue has been considered in some detail by David Hart in JPL²². Hart starts with the observation that:

"Some say that a directly enforceable Convention will lead to fundamental changes to planning and environmental law. The cynic will counter that all that will change is the drafting of the decision letter or judgment not the underlying process."

3.3 His conclusion, however, is that the Convention will make a significant difference:

"The most significant impact of the Convention upon planning issues will occur in the context of Articles 2 and 8 claims that a given development will affect local resident's health, and the prospect that the local authority or regulator might be held liable for the unwise grant of consent or the lax regulation thereafter. In my view that is likely to have a significant approach on the way in which complainants and public authorities approach issues such as risk to health or entitlement to information."

3.4 The emerging case law tends to support that conclusion. The most relevant Articles are, therefore:

Article 2: Right to life

1. Everyone's right to life shall be protected by law. No one shall be deprived of his life intentionally save in the execution of a sentence of a court following his conviction of a crime for which this penalty is provided by law.

2. Deprivation of life shall not be regarded as inflicted in contravention of this Article when it results from the use of force which is no more than absolutely necessary:

²² The Impact of the European Convention on Human Rights on Planning and Environmental Law. D Hart [2000]JPL 117-133.

(a) in defence of any person from unlawful violence;

(b) in order to effect a lawful arrest or to prevent the escape of a person lawfully detained;

(c) in action lawfully taken for the purpose of quelling a riot or insurrection.

3.5 It is clearly arguable that any proposal which is may bring forward deaths and hospitalisations (see below) would be in breach of the Article. It is particularly relevant that the exceptions are tightly defined and do not include economic considerations or issues of how practicable any reduction in emission levels may be. If the 'Right to Life' provisions of the Human Rights Act 1998 are not complied with then the only lawful decision available to the Waste Planning Authority is to reject the application.

3.6 Article 8, the 'Right to respect for private and family life', is also relevant

1. *Everyone has the right to respect for his private and family life, his home and his correspondence.*

2. *There shall be no interference by a public authority with the exercise of this right except such as is in accordance with the law and is necessary in a democratic society in the interest of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others."*

3.7 And:

Article 1 of Protocol No 1: Right to Property

Art 1/1/1 Every natural or legal person is entitled to the peaceful enjoyment of his possessions.

1/2/2 No-one shall be deprived of his possessions except in the public interest and subject to the conditions provided for by law and by the general principles of international law

3.8 Article 6 of the Convention protects the right to a fair trial. It provides that:

"in the determination of his civil rights and obligations or of any criminal charge against him, everyone is entitled to a fair and public hearing within a reasonable time by an independent and impartial tribunal established by law".

3.9 There are several aspects of this proposal which risk undermining the Article 6 rights. In particular if reliance is placed by the Inspector on 'black box' models such as WISARD used by the appellant but which are not reasonably available to residents groups in order to challenge the data

and the methodology then the residents will inevitably be prejudiced. This issue is dealt with in more detail below.

Relevant Case law:

3.10 The construction and operation of a large incinerator can have a significant impact on the private and family life of residents in the neighbourhood. The impacts of the proposal are already apparent and there is undoubtedly a high degree of anxiety about the possible impacts of emissions on air quality and health as well as about the dangers from increased heavy goods traffic. In a climate of great uncertainty and the adoption of precautionary approaches by major political parties and others (as described in the next chapter) the impacts on vulnerable members of the community such as nursing mothers and parents about to start families can be particularly marked. Article 8 is, however, qualified by express exceptions to the effect that an interference with the right may be justified if it is in accordance with the law and is necessary in a democratic society. Most of the legal argument has been about the extent and application of these qualifications. Hart wrote that:

“It is now well established that for the state to justify interference with such a right, it must show that:

(a) there is some specific, accessible and precise legal rule justifying the interference;

(b) the interference serves one of the aims set out in the qualification to the relevant Article;

(c) the interference is necessary in a democratic society, namely that there is a pressing social need for the interference and that the interference is proportionate to the aim pursued.

Adding that:

It is for the state or public authority to justify any interference in all the above respects. In domestic terms, the burden of proof shifts to the public authority once an interference is established under, say, Article 8(1) of the Convention.

3.11 In the case of *Guerra and Others v Italy*²³, the court considered the question of interference with the applicants' right to respect for their private and family life in a case involving toxic emissions to air from a factory producing fertilisers and caprolactan. The court held:

²³ European Court of Human Rights (116/1996/735/932), judgment of 19th February 1998

“58. The Court considers that Italy cannot be said to have "interfered" with the applicants' private or family life; they complained not of an act by the State but of its failure to act. However, although the object of Article 8 is essentially that of protecting the individual against arbitrary interference by the public authorities, it does not merely compel the State to abstain from such interference: in addition to this primarily negative undertaking, there may be positive obligations inherent in effective respect for private or family life (see the *Airey v. Ireland* judgment of 9 October 1979, Series A no. 32, p. 17, § 32). In the present case it need only be ascertained whether the national authorities took the necessary steps to ensure effective protection of the applicants' right to respect for their private and family life as guaranteed by Article 8 (see the *López Ostra v. Spain* judgment of 9 December 1994, Series A no. 303-C, p. 55, § 55).

...

...

60. The Court reiterates that severe environmental pollution may affect individuals' well-being and prevent them from enjoying their homes in such a way as to affect their private and family life adversely (see, *mutatis mutandis*, the *López Ostra v. Spain* judgment cited above, p. 54, § 51). In the instant case the applicants waited, right up until the production of fertilisers ceased in 1994, for essential information that would have enabled them to assess the risks they and their families might run if they continued to live at Manfredonia, a town particularly exposed to danger in the event of an accident at the factory.

The Court holds, therefore, that the respondent State did not fulfil its obligation to secure the applicants' right to respect for their private and family life, in breach of Article 8 of the Convention.

There has consequently been a violation of that provision."

3.12 The European Court of Human Rights thus followed *Lopez Ostra v. Spain*²⁴ which considered whether there had been a breach of Article 8 where a waste treatment plant operating without a licence released fumes and smells which caused health problems to local residents. The court held:

"51. Naturally, severe environmental pollution may affect individuals' well-being and prevent them from enjoying their homes in such a way as to affect their private and family life adversely, without, however, seriously endangering their health. Whether the question is analysed in terms of a positive duty on the State - to take reasonable and appropriate measures to secure the applicant's rights under paragraph 1 of Article 8 (art. 8-1) -, as the applicant wishes in her case, or in

²⁴ *Lopez Ostra v. Spain* [1994] 20 EHRR 277

terms of an "interference by a public authority" to be justified in accordance with paragraph 2 (art. 8-2), the applicable principles are broadly similar. In both contexts regard must be had to the fair balance that has to be struck between the competing interests of the individual and of the community as a whole, and in any case the State enjoys a certain margin of appreciation. Furthermore, even in relation to the positive obligations flowing from the first paragraph of Article 8 (art. 8-1), in striking the required balance the aims mentioned in the second paragraph (art. 8-2) may be of a certain relevance (see, in particular, the Rees v. the United Kingdom judgment of 17 October 1986, Series A no. 106, p. 15, para. 37, and the Powell and Rayner v. the United Kingdom judgment of 21 February 1990, Series A no. 172, p. 18, para. 41)."

3.13 As to the Spanish Authorities duty, the Court held at para 55:

".....the Court considers that in the present case, even supposing that the municipality did fulfil the functions assigned to it by domestic law (see paragraphs 27 and 28 above), it need only establish whether the national authorities took the measures necessary for protecting the applicant's right to respect for her home and for her private and family life under Article 8 (art. 8) (see, among other authorities and mutatis mutandis, the X and Y v. the Netherlands judgment of 26 March 1985, Series A no. 91, p. 11, para. 23)."

3.14 And concluded at para 58 that:

"... despite the margin of appreciation left to the Respondent state, the court considers that the state did not succeed in striking a fair balance between the interest of the town's economic well-being - that as having a waste-treatment plant - and the applicant's effective enjoyment of her right to respect for her home and her private and family life. There has accordingly been a violation of Article 8."

3.15 Hart comments that Article 1

"tends to be unprofitable ground for a claimant because of the width of the qualifying provision which enable public authorities to justify their action"

3.16 Whatever the subsequent practical difficulties of challenging a decision under this Article, however, do not mean that it should not be carefully weighed before any decision is made. Any steps taken which may interfere with possessions must strike a fair balance between the demands of the general community and the requirements of the protection of the individual's fundamental rights

3.17 There are clear indicators of how the peaceful enjoyment of property is reduced by incinerators if property values are used as a surrogate

indicator²⁵. The United States Environmental Protection Agency (USEPA), for example, has developed a property value screening analysis using distance from a combustion facility as a proxy for emissions reduction²⁶.

- 3.18 The basis for the analysis is a study of property value effects around a municipal waste incinerator; The US work demonstrated how housing prices were influenced by building of incinerators and how prices increase with distance from the facility. Data was also used from studies around landfill sites.
- 3.19 The study of particular relevance to a potential incinerator is that by Kiel and McClain which indicates that incinerators have effects on house prices up to about 3.5 miles – generally further than for landfills and that the maximum impact of \$ 8,100 per mile loss of value occurs as the facility goes on line with prices recovering slightly to a loss of \$ 6,670 per mile when the facility is operational. These data are a good indication of practical responses to, and impacts of, public concern about health effects from both incinerators and landfill sites.
- 3.20 This research has been reflected by the anecdotal evidence presented to the planning authority in relation to a similar incinerator application in Kidderminster. The submission by the Bovis Homes Action Group, for example, reports that *“a senior partner of a Kidderminster firm of estate agents has predicted a 15% fall in the value of residential property in the area. On this basis, it is estimated that as much as £ 3 Million would be wiped off the value of homes at Forest Gate alone.”* Several reports in the local press reinforced these concerns about the impacts on property prices, reflecting the high levels of anxiety felt in relation to the application.
- 3.21 The response of industrial interests has been even more risk adverse – when a proposal for an incinerator was made in Goole on the Glews Hollow industrial site the site owners, Tokenspire Properties Ltd, took out full page advertisements in the local press²⁷ advising that:

“Tokenspire directly or indirectly has created over 3000 jobs in the last ten years and wishes to increase this figure by creating more jobs at Glews Hollow through the construction of affordable units but is advised by a number of prospective

²⁵ This is also an indication of public perception of risk

²⁶ “Regulatory Impact Assessment For Proposed Hazardous Waste Combustion MACT Standards Draft” Prepared for: Office of Solid Waste U.S. Environmental Protection Agency Washington, DC 20460 Prepared by: Industrial Economics, Incorporated, 13/11/95

²⁷ See, for example, ‘Public Announcement, Glews Hollow Waste Incinerator’ Courier Series 30th July 1998

tenants that they will NOT consider this area if planning for the waste station is granted. A decision which rests with your local authority. “ (capitalisation emphasis in the original)

- 3.22 There is no reason to believe that there would not be a similar desire to avoid these risks by industrial investors who may want to locate in Sheffield. This would be consistent with the increasing international concerns about the potential impacts of incinerators on food supplies (or even the perception of risk by the public which can be equally damaging). This is reflected in policies adopted by companies like Poulets Duc SA one of the largest French feed suppliers who have a policy of not sourcing any products produced downwind of incineration plants²⁸.

The Portsmouth Decision

- 3.23 It may be suggested that the issue of human rights and incineration has been review in the context of the decision²⁹ on the planning appeal for the Hampshire Waste Services Incinerator in Portsmouth.
- 3.24 The Secretary of State’s decision on the Article 2 Human Rights Act in that case was:

Human Rights

10. Representations were submitted at the Inquiry that the proposed incinerator would be contrary to Article 2(1) of the European Human Rights Convention because loss of life would result. In considering the evidence of emissions to air the Inspector concluded that emissions from the incinerator might cause a loss of life expectancy, in the worst case, of probably only a few hours (IR 12. 99). In discussing the position under Article 2 (1) the Inspector refers to some very limited loss of life (IR 12.204). However, the Secretary of State is clear from the Inspector's earlier conclusion in IR 12.99 that he is referring to loss of life expectancy.

11. Article 2 imposes a positive duty on the State to safeguard the life of its citizens. In the Secretary of State's view this obligation may extend to a duty to protect the public from life threatening environmental pollution, but he does not consider that emissions from the proposed incinerator at Portsmouth would fall

²⁸ Production areas are to be more than 2 km from an incinerator and not in a cone with a length of 10 km downwind

²⁹ **TOWN AND COUNTRY PLANNING ACT 1990 - SECTION 78 APPEAL BY HAMPSHIRE WASTE SERVICES LIMITED PORTSMOUTH INCINERATOR, QUARTREMAINE ROAD, COPNOR, PORTSMOUTH** Planning Inspectorate Reference: APP/Z1775/A100/1037287 Decision dated 15th October 2001

within that description. The Secretary of State accepts that in the worst case there might be a loss of life expectancy of a few hours, but he does not consider that this would result in a violation of rights under Article 2.

3.25 It is apparent, as illustrated below, that the Secretary of State has not assessed the worst case impacts assessed by the Inspector in reaching these conclusions. It is also interesting that the Secretary of State makes a distinction between 'loss of life expectancy' and 'loss of life' (which were treated as the same thing at the inquiry) apparently to avoid the quandary faced by the Inspector of having to apply the 'Principle of Proportionality' to Article 2. The Inspector had reported:

12.202 The Appellants questioned whether Article 2 imposed a duty on the Secretary of State to protect persons from life-threatening hazards that could arise from a development; especially one that has IPC authorisation. They sought support for this view from the fact that the Government had not changed the IPC/IPPC regime since the Human Rights Act came into force and they claimed that Waste Strategy 2000 anyhow dealt with the requirement not to endanger human health. Regardless of these arguments, taking into account the Principle of Proportionality, they considered that there was no basis for withholding permission (6.309).

12.203 The interpretation of the submissions on the Human Rights Act is a legal matter, but it seems to me that Waste Strategy 2000 and the lack of change to the regulatory system may be contributory arguments, but can hardly be conclusive in this matter.

*12.204 I have already concluded that the emissions would probably cause some, very limited loss of life; in the worst case perhaps up to half a day (12.99) and, in my view, that would be contrary to Article 2(1). But, the Principle of Proportionality should be applied to the Convention as a whole, including the interpretation of this article. Because of this, **I conclude that the very small effect of the emissions would come within the margin below which it would not be 'proportional' to dismiss the appeal on the basis of Article 2(1).***

3.26 This raises two questions:

- 1) were the worst case conclusions considered in reaching this view?
- 2) was it correct (and lawful) to apply the 'principle of proportionality' to Article 2?

3.27 Considering each in turn:

Were the worst case conclusions considered in reaching this view?

3.28 The Inspector wrote at para 12.99:

12.99 *It is quite clear to me that there is no definitive answer. But, from the foregoing, it seems that the NOx, SO2 and particle emissions from the incinerator might cause a loss of life of perhaps up to a day for a person who lived continuously in the area of maximum increased ground level concentration. Although the modelling exercise indicated that point of maximum concentration most frequently over the Anchorage Park residential area (9.25), the actual location would vary widely with the prevailing wind conditions and the concentration would fall sharply away from the centre of the plume. Bearing these points in mind, it seems to me that even in the worst case, any loss of life expectancy would probably be of only a few hours, and certainly less than 1/2 a day.*

- 3.29 It is important to appreciate that this was based upon chronic impacts and mainly from the appellants acceptance that particulates would lead to greater numbers of deaths:

12.98 *With regard to particulates only, the Appellants pointed out that it was the long-term exposure that is important (6.194). On that basis, they accepted a probable loss of life expectancy for a person who lived continuously at the point of maximum increased concentration amounting to about 0.84 of a day (6.194). That was from information contained in a study by the Institute of Occupational Medicine referred to by the Council (6.194). However, they also pointed to the fact that this location would vary with the wind direction and strength; therefore no-one was likely to be so badly affected. Taking a 0.01 ug/m³ instead of the maximum of 0.06 ug/m³ would further reduce that to about 3.4 hours loss of life expectancy (6.194). The Appellants accepted that applying this latter figure to the approximately 135,000 people living within the 0.01 ug/m³ isoline would give a total loss of life of perhaps 52 years (6.181, 7.125).*

- 3.30 In addition to this the Inspector also accepted the evidence of Portsmouth City Council about acute impacts deaths from SOx and PM:

12.97 *..... Therefore, taking the Sulphur Dioxide and particulate effects only in this calculation would give (38tpa x 0.005) + (7tpa x 0.002) = 0.241 deaths per annum and on the same basis 0.249 increased hospital admissions per annum. Assuming an operating life of up to 30 years this would equate to some 7.23 deaths and 7.47 admissions. I also acknowledge that many more people would be likely to visit their doctor than would be admitted to hospital, though I have no information on which to assess the Council's ratio of 60:1³⁰ (7.126).*

³⁰ This was drawn from a paper "Estimate of the additional hospital admissions for respiratory disorders that can be attributed to summertime photochemical ozone episodes" by JR Stedman AEA Technology funded by the Department of the Environment and published in "Health Effects of Ozone and Nitrogen Oxides in an integrated Assessment of Air Pollution" UNECE/WHO Proceedings of an international workshop, Eastbourne UK 10-12 June 1996. The relevant extract was:

- 3.31 There seems to have been some confusion in the mind of the Inspector mind between 'acute' and 'chronic' impacts and this has resulted in an underestimation of the total impacts in his conclusions.
- 3.32 The total impacts assessed at the inquiry were therefore 52 years loss of life due to chronic particulate impacts; 7.23 deaths brought forward due to acute SOx and Particulate effects; 7.47 hospital admissions caused or brought forward; c 430 GP visits not leading to hospital admissions
- 3.33 These impacts would be significantly greater if the factors collected by Kunzli were used to calculate the health impacts. (Public-health impact of outdoor and traffic-related air pollution: a European assessment N Künzli, R Kaiser, S Medina, M Studnicka, O Chanel, P Filliger, M Herry, F Horak Jr, V Puybonnieux-Textier, P Quénel, J Schneider, R Seethaler, J-C Vergnaud, H Sommer *The Lancet* Volume 356, Number 9232).

Is it correct (and lawful) to apply the 'principle of proportionality' to Article 2 ?

3.34 Article 2 requires that:

RIGHT TO LIFE

1. *Everyone's right to life shall be protected by law. No one shall be deprived of his life intentionally save in the execution of a sentence of a court following his conviction of a crime for which this penalty is provided by law.*

3.35 The only qualification to this is given in Article 2(2):

2. *Deprivation of life shall not be regarded as inflicted in contravention of this Article when it results from the use of force which is no more than absolutely necessary:*

(a) in defence of any person from unlawful violence;

(b) in order to effect a lawful arrest or to prevent the escape of a person lawfully detained;

(c) in action lawfully taken for the purpose of quelling a riot or insurrection.

3.36 The courts apply the principle of proportionality to establish whether the derogation meets the appropriate standard but I am not sure that it is reasonable or lawful to apply the principle to Articles without

"For every hospital admission for lower respiratory diseases there are about 60 people who consult their general practitioner but are not admitted. Many more episodes of asthma and other lower respiratory problems such as bronchitis do not lead to a consultation at all. Admissions therefore represent the tip of the pyramid of severity"

qualification. In the case of Article 2 none of the qualifications are relevant to the decision to build an incinerator.

3.37 By comparison Article 8 (Everyone has the right to respect for his private and family life, his home and his correspondence) has several of derogations including:

2. There shall be no interference by a public authority with the exercise of this right except such as is in accordance with the law and is necessary in a democratic society in the interests of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others.

3.38 It is in the interpretation of actions relating to qualifications such as these that the 'principle of proportionality' can reasonably be used.

3.39 Furthermore the Sheffield case is materially different from the Portsmouth proposal because:

- The Portsmouth Incinerator already had a pollution control authorisation from the Environment Agency
- A full BPEO assessment had been presented as part of the supporting evidence
- The Portsmouth plant was smaller (165,000 tpa) with lower emissions and was integrated with a major recycling facility (MRF) on the same site.
- The proposals/ contract allowed upto 40% recycling (which is still not ambitious but is much greater than proposed for Sheffield)
- The Development plan, which included a recent 'Waste Local Plan' was supportive of the use of an incinerator on that site

3.40 No reassurance can be gained, therefore that the greater number of deaths and hospitalisations that are likely to be caused and brought forward by the larger proposal in Sheffield do not conflict with either the 'relevant Objectives or the human rights obligations of the Sheffield City Council under the Act.

4. Public Concern

4.1 The legal significance of, and the case law relating to, widespread public concern to planning applications may be summarised as follows:

- Decision-makers must recognise that the public concern is so important that, even if unfounded, it can constitute a valid reason for refusing planning permission (*Newport*³¹).
- Emotional responses to a proposed land use are capable of being material (*West Midlands Probation Committee and Broadlands District Council*).
- Decision-makers must attach due weight to the justified concerns (being land considerations) of any companies concerned that if the proposal goes ahead they may be forced to relocate (*Broadlands District Council; Norwich City Council*³²).

4.2 There is no doubt that public concern is material – In order to assist the Planning Authority determine what weight should be given to the matter the issues that lie behind the public perceptions are examined in more detail below.

4.3 In *Newport County Borough Council v Secretary of State for Wales and Browning Ferris Environmental Services Ltd*³³ Aldous L.J highlighted the illogical nature of a finding that public perception was a relevant consideration but that it had no substance in planning terms.

“there is a difference between local opposition and a perceived fear which by itself could affect the amenity of the area. The Circular [5/87] makes it clear that if there are planning reasons, refusal may be reasonable. A perceived fear by the public can in appropriate (perhaps rare) occasions be a reason for refusing planning permission, whether or not that has caused local opposition. It follows that the Circular contemplates that planning reasons such as public perception can (again perhaps rarely) warrant refusal, even though the factual basis for that

³¹ *Newport County Borough Council v Secretary of State for Wales and Browning Ferris Environmental Services Lt* [1998] J P L 377

³² *Secretary of State for the Environment v Redland Aggregates and Norwich City Council* [1998] Env.L.R D12

³³ [1998] J P L 377

fear has no scientific or logical reason. That being so I conclude that the judge wrongly interpreted the Circular."³⁴

- 4.4 This raises three questions to be addressed in determining what weight to give the material consideration of the public perception of risk:
- i. Was there a perceived fear by the public of the incineration proposal (*'whether or not that has caused local opposition'*)?
 - ii. Was that fear logical?
 - iii. Was that fear scientifically based?
- 4.5 There is undoubtedly widespread local concern about the Sheffield incinerator proposal.
- 4.6 In relation to the second and third questions Neil Stanley argues in JPL that without a sophisticated understanding of "public concern" that decision makers will not be able to deliver just decisions.³⁵ It is a fundamental proposition of his article that public concern can only be properly weighed if the decision-maker has an adequate understanding of the factors, influences, and processes which together operate to create "public concern".
- 4.7 The second and third questions are therefore addressed below with more detailed analysis, particularly of the scientific issues, included in the following chapters.

There is no doubt that the incinerator would be a prominent industrial building. The design is massive, ugly and slab sided with no mitigating architectural design such as is now commonly found on buildings for waste handling - the Onyx sites in Marchwood and Portsmouth being good examples. However the concerns of the public will undoubtedly be increased by a highly visible 70 m high stack and the inevitable plume (but which is not shown on any of the photomontages).

Is the Public Concern Logical?

- 4.8 It is relevant to consider here Stanley's 'factors, influences, and processes which together operate to create "public concern"'.

³⁴ p385

³⁵ Public concern: The decision-makers' dilemma, [1998] JPL 919-934

Factors:

4.9 The 'factors' are likely to influence risk perceptions are outlined in the recently published DETR report on risk³⁶ in which risks from incinerators are highlighted as a specific example:

- *Risks which are involuntarily imposed (e.g. pollution from an incinerator) tend to be seen as less acceptable than voluntary ones (e.g. driving a car or undertaking dangerous sports).*
- *Unfamiliar risks (e.g. genetically modified organisms) tend to cause greater concern, particularly if they are considered to be poorly understood by science.*
- *Activities which pose a threat of a dreaded form of death, injury or illness (e.g. cancer) are viewed with alarm and are less acceptable.*
- *Man-made or 'technological risks' (e.g. pesticides, nuclear power stations) are less acceptable than natural ones (e.g. floods and radon).*
- *A risk which may cause a single large-scale consequence (e.g. civil aviation accident) causes more concern than risks which result in numerous small-scale consequences (e.g. car accidents).*
- *Alarm may be caused by risks when the consequences of exposure are delayed and cause hidden or irreversible damage (e.g. exposure to ionising radiation).*
- *Inequitable distribution of risks and benefits as a result of a particular activity is likely to make a risk less acceptable.*
- *Activities which pose a risk to certain groups such as children and future generations are generally more worrying.*
- *Risks which are the subject of controversy and contradictory information generally cause concern.*

4.10 It is clear that both categories of factors which can adversely affect risk perceptions are very largely characteristics of the proposed incinerator.

4.11 The Environment Agency raise³⁷ more specific reasons for public concern in relation to incineration:

5.2. The public is concerned about incinerators for a number of reasons:

- *potential impact upon health*

³⁶ DETR Guidelines for Environmental Risk Assessment and Management Revised Departmental Guidance, August 2000

³⁷ Item 7: 12 July 2000 Board Meeting

- *mistrust regarding the control and emissions standards imposed and the type of materials that will be going into the incinerator*
- *public frustration/feelings of powerlessness that they have no choice or influence on the decision*
- *transport impacts within their local area*
- *location and impact on the neighborhood (sic)*

4.12 These issues will be examined in more detail below.

Reasons for Public Concern about Incineration

Influences and Processes:

4.13 In considering further how logical the public concern may be it is also important to consider the external influences. These include:

Trust in Government and Industry:

4.14 The DETR report³⁸ that:

“Conflict and controversy have characterised some recent risk debates, and distrust in the risk assessment and management process plays a central role in these cases. Trust and credibility are frequently identified as important determinants of risk perception. It is important to be open and accountable, and to take differing views into account rather than disregarding them as 'emotive' or 'irrational'. While such a climate may help to build confidence, it should be stressed that trust is eroded very easily and once lost is difficult to restore.”

4.15 There is significant evidence that the public do not have great confidence in information provided by either Government nor industry. The Parliamentary Office for Science and Technology³⁹, for example, indicate that levels of public trust are:

³⁸ Guidelines for Environmental Risk Assessment and Management Revised Departmental Guidance, July 2000, <http://www.environment.detr.gov.uk/eramguide/index.htm>

³⁹ POST, Safety in Numbers Report No 81, from Summary page 3, June 1996

- 4.16 It is very likely, therefore, that any reassurances about risks given by the Environment Agency, Government Departments or the waste disposal industry are likely to carry little weight with the public.
- 4.17 Senior representatives of the incineration industry have gone so far as to accept that the gaining of planning permission for incineration plants requires that the Democratic process and local opinions are overridden. Malcolm Chilton gave evidence⁴⁰ as Chair of the Energy from Waste Association to the Environment Transport and Regional Affairs Committee for their report on Sustainable Waste Management, for example:

(Mr Chilton) "There is a valid dilemma. I believe in democracy so I think we should involve the public, yes. One thing we will not do in my view, having tried it on many occasions, is convince people living in the immediate neighbourhood of a plant that this is a good thing and get them to vote democratically in favour of it. That is quite difficult at a very local level and that is why I think that if these plants are required then there has to be some compensation for living nearby. I cannot see any other alternative to it. Certainly by power of argument we are not going to convince them that this is better in their backyard compared to two or three miles down the road."

Statements by Ministers and Conclusions of Parliamentary Committees:

- 4.18 The evidence from the Minister, Mr Meacher, to the House of Lords for their report on Incineration⁴¹ gives strong support to the public concerns about incineration and related emissions:

"Q437:Over the location of incinerators, I can think of hardly anything with the possible exception of nuclear dumps which the public is more concerned to avoid. The NIMBY syndrome is extremely strong and it is important that planning controls, as well as the Environment Agency's issuing of waste management licences (but here we are taking particularly of planning controls over location), should involve the public as much as possible."

⁴⁰ Sustainable Waste Management, Environment Transport and Regional Affairs Committee, HC 484 – II, page 95, 17th June 1998

⁴¹ 'Waste Incineration' with evidence, House of Lords Select Committee on the European Communities, 11th report HL Paper 71, 15th June 1999

- 4.19 It is perhaps not surprising that the public should express such concerns – which highlight that incineration should possibly be considered as a special case in planning terms – when the Minister went on to say that:

Q438: ...Incinerator plants are the source of serious toxic pollutants; dioxins furans, acid gases, particulates, heavy metals and they all need to be treated very seriously.... There must be absolute prioritisation given to human health requirements... ...and the protection of the environment.

- 4.20 However it is difficult to see how this can be effectively achieved in the light of his further evidence that:

Q440: ... I repeat that the emissions from incinerator processes are extremely toxic. Some of the emissions are carcinogenic. We know scientifically that there is no safe threshold below which one can allow such emissions. We must use every reasonable instrument to eliminate them altogether...

- 4.21 The natural and reasonable response of the public to such statements would be to argue that the only instrument that is protective of their health, and that of their children, in the face of such clear uncertainty is not to place large incinerators in close proximity to their homes and schools. Such concerns are likely to be particularly acute in areas known already to have high levels of some pollutants as the Minister went on to say:

Q 441: ... It is the overall impact, deposition of substances of different kinds on the environment and the cumulative impact that we do need to be concerned about...

- 4.22 And accepts that the health impacts of these proposals cannot be accurately assessed in any case:

Q 468: ... It strikes me that we say in a rather blasé manner that we understand the health impacts of all these things, when our knowledge in this particular field of chemical exposure is very limited.

- 4.23 The Minister also reflected the widespread concerns of the public that whilst standards may be set, and achieved, for some emissions those standards may still not be protective of health as so often new and more potent impacts have been found in the past after more careful scrutiny of chemical impacts:

Q 468: ... It is the responsibility of the Environment Agency to look at the overall deposition impacts. I am not sure how well honed that concept is, but certainly with regard to what we have been talking about here; cadmium, mercury and lead, which originate from many different sources, it is of course the cumulative impact which is so serious. ...I often wonder about whether those safety margins are absolutely, wholly and soundly based....

4.24 Furthermore the conclusions of the Lords, having heard the evidence of the Minister and others support the concerns of the public about emissions - including dioxins and particulates - from 'new' incinerators:

(110) when the precautionary principle is applied, we think that it would be wrong to discount public concern about the health implications of incineration products (especially dioxins) on the grounds that it is derived from the experience of an older generation of municipal incinerators which the 1989 Directives have essentially done away with. Although considerable progress has been made in understanding the toxicology and exposure effects of many of the key pollutants, continued epidemiological work will be needed. We consider there are well established grounds for caution, justifying the general approach of the draft Directive. We feel that the collection and study of data on the potential health risks from combustion products should continue to be a priority. In particular in the light of the evidence from health professionals about emissions of particles of ammonium nitrate below PM2.5, and their behaviour in the body,.....

4.25 *This conclusion was reached in spite of their having been provided with no evidence of "any scientific proof of a direct causal link between any incineration plant in the UK and local mortality and morbidity".*

4.26 Little evidence was presented to the Lords on these issues, however, and more work has been published since they reported. The evidence available indicates that the Lords were quite correct to highlight concerns about ultra fine particulates and that this is supported by an increasing body of published research as shown in the following chapters.

The Government's Assessment of Incineration Impacts

4.27 The DETR published the final version of the Regulatory and Environmental Impact Assessment of the Waste Incineration Directive⁴² in June 1999. This information included within this shows that each tonne of emissions from incinerators have the following impacts:

Pollutant	Quantified Impacts	
	No of deaths brought forward	No or respiratory hospital admissions caused or brought forward
Ozone (from NO _x)	0.02/t	0.04/t
SO ₂	0.005/t	0.006/t
Particulates	0.002/t	0.003/t

⁴² DETR Regulatory and Environmental Impact Assessment of the Waste Incineration Directive Final report Entec, June 1999, from p 17 and Appendix 2

4.28 More than 18 months after publication of this report a correction was made by the DETR⁴³. This indicated that the consultants, ENTEC, had made an error in the NO_x calculation of 100 fold⁴⁴. The corrected version of the ozone row of the table is therefore:

Pollutant	Quantified Impacts	
	No of deaths brought forward	No or respiratory hospital admissions caused or brought forward
Ozone (from NO _x)	0.0002/t	0.0004/t

4.29 The annual emissions authorised from the proposed incinerator include more than 224 tonnes⁴⁵ of NO_x, more than 56 tonnes of SO₂ and more than 11 tonnes of particulates. The calculations in the air quality section below show that on the basis of the revised DETR figures the calculated impacts from the plant include 0.46 deaths brought forward each year and more than 8.7 deaths brought forward and 11.4 hospitalisations caused or brought forward over a 25 year operating life. The impacts predicted for NO_x impacts arise through the generation of secondary ozone and is not, therefore related to the population around the plant. The Environmental Statement is silent on this aspect of the emissions (even though ERM are aware of the DETR ozone generation data from previous inquiries).

4.30 The Government has also accepted that incineration is environmentally damaging when assessed as displacing the average mix of electricity generation. Table C4 of Waste Strategy 2000, for example, indicates that the external costs are:

Table C4: External costs and benefits of different waste management options

Waste Management Option	External Cost Estimate, £ Per Tonne of Waste, 1999 Prices
Landfill	-3

⁴³ but only after concerns about this issue were raised by Greenpeace in relation to their occupation of the Edmonton Incinerator and by Public Interest Consultants in written and oral evidence to the Environment Transport and Regional Affairs Committee

⁴⁴ This error was strongly criticised by the Environment, Transport and Regional Affairs Committee in their 5th Report where they wrote: "Entec's error is more than unfortunate: where such a study should have brought clarity to the health effects of incineration, instead it has contributed directly to the confusion which surrounds this complex topic."

⁴⁵ NO_x 224,204 kg, SO_x 56,123 kg and Particulates 11,225 kg based on 8,035 hrs year operation (225,000 tpa at 2 x 14 t/hr) availability

Table C4: External costs and benefits of different waste management options

Waste Management Option	External Cost Estimate, £ Per Tonne of Waste,1999 Prices
Incineration (displacing electricity from coal-fired power stations)	+17
Incineration (displacing average-mix electricity generation)	-10
Recycling	+161
-Ferrous metal	+297
-Non-ferrous metal	+929
-Glass	+196
-Paper	+69
-Plastic film	-17
-Rigid plastic	+48
-Textiles	+66
Source: Adapted from Coopers & Lybrand et al (1997)	

- 4.31 Modern incinerators generate 24-hours/day and cannot displace coal-power when no coal plant are fired up. They must therefore be considered to displace baseload nuclear plus gas and not as displacing old coal fired power stations. This means that every tonne of waste that is burned imposes an environmental cost of at least £ 10 – three times worse than landfill at £ 3/tonne environmental damage. Recycling that waste by contrast gives environmental benefits of more than £ 160/tonne.
- 4.32 These results are indicative and the disbenefits assessed in these calculations are limited. Energy, transport and greenhouse gas emissions are the principal environmental factors considered in the analysis. The life cycle analysis and economic valuations focus on the impact of air pollution from waste facilities and vehicles, and the emissions associated with energy use. The impacts of the greenhouse gases carbon dioxide, carbon monoxide, methane and nitrous oxide were considered, as were those of sulphur and nitrogen oxides and PM₁₀ particulates. The cost of road accidents was also brought into the equation.
- 4.33 Several environmental costs and some benefits were excluded from the analysis however. Most importantly, these include the disamenity impacts of waste management facilities. Omitting them from the equation also means that other options get no credit for averting disamenity.

Landfill leachate and certain air pollutants, including dioxins emitted from landfill flares and incinerators, were also excluded from the assessment. Another omission is any measure of the damage to nature and disamenity caused by mineral and peat extraction. Neither does the study include any scarcity value for non-renewable materials. If these factors were included then the environmental costs of landfill and incineration would probably be significantly greater than the current estimates.

- 4.34 Mr Meacher in his recent evidence to the Environment, Transport and Regional Affairs Committee⁴⁶ emphasised that:

"The best practicable environmental option in the vast majority of cases is recycling."

- 4.35 The Government also accepts in Waste Strategy 2000⁴⁷ that it may not be possible to put into practice some of the scenarios considered as part of the Regulatory Impact Assessment of the Strategy because of:

"the difficulty typically experienced in finding suitable sites and gaining public support for incinerators"

- 4.36 The recently published Life Cycle Assessment in the Environment Agency 'Strategic Waste Management Assessment' supports this conclusion and shows that for all the parameters considered⁴⁸ (air acidification, depletion of non-renewable resources, greenhouse effect, photochemical oxidant formation) recycling had a greater environmental benefit than incineration.

The Poor Performance of 'State of the Art' Incinerators

- 4.37 The incineration industry likes to dismiss their many problems and lack of public confidence as being due to 'old' incinerators which have since been closed. This is not the case. Not only were those 'old' incinerators operated by many of the same companies who now want to operate new plant but they were regulated by the Environment Agency and were allowed to continue operating until they were forced to close by European Directives.

- 4.38 The huge numbers of exceedances of authorisation conditions for 'modern' incinerators, each a criminal offence, are noted below. No modern MSW incinerator has been in complete compliance with the

⁴⁶ Evidence given on 12/12/00

⁴⁷ DETR Waste Strategy 2000 Part 2, Annex C p181.

⁴⁸ Figure 5.6 page 52

conditions of the IPC authorisation. Furthermore there have been some serious incidents on modern plants. Recently, for example there was a major fire at the Dundee incinerator (no assessment has been made of such impacts in the Environmental Statement) and ENDS⁴⁹ reported:

“A major fire has put Dundee's state-of-the-art municipal incinerator out of action and damaged efforts to gain public confidence in energy from waste. Meanwhile, a long-awaited report into pollution from the city's previous incinerator has found serious dioxin contamination at the site boundary.”

4.39 Incineration plant operated by ONYX does not have a good record of compliance. Besides the ongoing problems adopted at Sheffield the company has faced serious problems with their SELCHP and Tyseley operations. More details are given in the Greenpeace report ‘*Criminal Damage: A review of the performance of municipal waste incinerators in the UK*’. A copy of this report is attached to this submission.

4.40 Problems at Sheffield include, but are not limited to, the record breaches of authorized emissions levels. There are reported to be a total of 28 Fire Brigade call outs to the site during 2001, 22 of which were false alarms. The actual incidents included:

- 2nd May - Welding fire
- 21st May - Conveyor belt fire
- 19th June - Electrical fire
- 26th November - Fire in rubbish collected on girder
- 27th November - Explosion on second floor of incinerator
- 19th December - Conveyor belt fire

4.41 This data was reported by the fire services rather than by the operators or the City Council which again reduces public confidence that future failures will be dealt with in an open manner.

Policy Developments in the Main Opposition Parties

Conservative Party Policy:

4.42 The Conservative party policy on incineration was published with significant press coverage in their policy document ‘A Cleaner Greener

⁴⁹ ‘Fire at Dundee incinerator hits efforts to rebuild public confidence’ ENDS 308, September 2000

Britain: A Blue Green Approach to Waste and Recycling". Mr Damian Green MP noted⁵⁰ that:

"Mr. Damian Green (Ashford): When the Minister considers his policy towards incineration and the Opposition's more environmentally friendly policy, will he and his colleagues take to heart the comments of the Green Alliance which, in its parliamentary newsletter, says that the Conservatives have

'succeeded . . . in catching the public mood by acknowledging recent scientific unease and public concerns over incineration?'

He should take that to heart because the director of the Green Alliance, who wrote that, has just been appointed his Department's environmental adviser."

4.43 The Conservative policy argues that:

"Labour plan to cover the country with new incinerators to make up for their failure to promote recycling. Conservatives will halt this escalation in the number of incinerators, and instead give new resources to local authorities to promote recycling and green behaviour amongst businesses and residents."

4.44 And indicates that:

"Conservatives propose to tackle the problem of waste in three ways: Firstly, we will clamp down on unnecessary, dirty incinerators. Next, we will actively promote recycling – giving every household the opportunity to help the environment. Thirdly, we want to change the whole culture surrounding waste – working to change public attitudes to waste disposal, packaging and dumping.

- *We will introduce a moratorium on new incinerators until independent British scientific evidence proves they are safe.*
- *Tighter controls must be introduced on emissions from all incinerators.*
- *Any incinerators should be used to generate energy from waste.*
- *Local residents should receive benefits from being sited near an incinerator."*

4.45 Clearly acknowledging that there are grave concerns about even new incinerators and suggesting that the way to recover public confidence must be on the basis of taking a precautionary approach by halting any new building and seeking independent British evidence of safety.

Liberal Democrat Policy

4.46 The Liberal Democrat Policy on incineration is similar to, but more specific, than that of the Conservatives⁵¹:

⁵⁰ Hansard 13 Jun 2000 : Column 777

“Enabling an effective waste management strategy, which would ensure that 60% of household waste is recycled by 2010, and a moratorium of new incinerators until research shows that they are safe and the best environmental option”

4.47 The Sheffield Proposal obviously falls far short of meeting those policy requirements.

4.48 Tom Brake MP, Liberal Democrat Shadow Environment Minister said⁵²:

“Britain is near the bottom of the EU recycling league tables whilst the number of incinerators is set to soar - polluting our atmosphere with potentially lethal dioxins. Liberal Democrat proposals would see a massive increase in recycling, re-use and waste minimisation and a reduction in landfill without resorting to unpopular, dangerous incinerators.”

4.49 The commitment⁵³ that the party has made is to achieve the 60% recycling target by 2010 by introducing:

“a national programme to bring doorstep recycling to every household.”

4.50 As long ago as 1998 the Parties Policy review⁵⁴ included:

*Reducing the problem of industrial waste by adopting a target of zero industrial waste to landfill within 40 years; significantly increasing landfill tax rates, with revenue channelled back to local authorities for investment in waste reduction and recycling schemes; the introduction of an incineration tax, together with a **presumption against the approval of new incineration capacity** so that recycling and reuse policies can be further developed; and moving towards the phasing out of bio-accumulative and persistent chemicals. (**our emphasis**)*

4.51 Both main opposition parties therefore adopt policy positions based on the dangers of incinerators. In these circumstances it is not surprising that the public are alarmed.

4.52 These political attacks on incineration extend to the Labour controlled National Assembly for Wales⁵⁵ have passed a resolution, carried by 43 votes to 8, in May 2000 including:

⁵¹ reaffirmed and tightened at the 2001 Conference

⁵² Press Release 23/5/00

⁵³ Press Release 28 May, 200 Lib Dems call for clean-up

⁵⁴ <http://www.brighton98.libdems.org.uk/agenda/papers/review/finenv.htm>

⁵⁵ National Assembly for Wales, The Official Record, 10/May 2000 <http://www.wales.gov.uk>

“The assembly resolves to implement an all Wales waste strategy with the following characteristics:

That there is a clear movement away from unsustainable landfill and incineration towards recycling and sustainability.

That a planning presumption be introduced against further incineration and landfill developments in Wales in the interests of sustainability; “

4.53 More recent developments include support for the Greenpeace closure of the Edmonton incinerator by the Mayor of London and the subsequent letter, sent in December 2000, to the DTI objecting to the expansion of the Edmonton plant by the deputy Mayor Nicky Gavron.

4.54 The subsequent trial and acquittal of Greenpeace activists accused of criminal damage whilst closing Edmonton Incinerator for repeated breaches of authorisations was a decision reached in spite of large Environment Agency input into the prosecution case. It indicated that the jury believed that it was appropriate for Greenpeace to take the action notwithstanding the powers of the Environment Agency and was an indictment by the jury of the failure of regulatory control.

4.55 Planning responses to these concerns has included the 5 year moratorium on incineration capacity in Hertfordshire⁵⁶ and have subsequently announced that there will be no incineration in their draft strategy. ENDS reported⁵⁷:

“The Hertfordshire councils believe that public opposition to incineration provides a moral argument for rejecting the technology. Furthermore, district councils look set vehemently to oppose moves to site an incinerator within their boundaries.”

4.56 the ‘presumption against’ incineration included in the revisions of the Essex Waste Local Plan until the high (60% plus) recycling targets have been tested. Following an inquiry the Proposed Modifications to the Essex and Southend on Sea Waste Local Plan contains a similar ‘presumption against’ incineration until the high diversion rates proposed by the plan have been tested. These modifications have been approved and are currently on deposit prior to adoption. Paragraph 1.10 of the proposed modifications outlines those targets:

⁵⁶ News Release No: PR196 === Week Ending 14 July 2000 COUNTY COUNCIL SAYS NO TO INCINERATION Hertfordshire won’t see the prospect of a waste incinerator being built for the next five years, Hertfordshire County Council has pledged. <http://www.hertsc.gov.uk/>

⁵⁷ Councils and waste firms seek alternatives to incineration ENDS August 2001, Issue No. 319

"In April 1999 the WDA's and WCA's agreed to a statement of intent entitled 'Working Together', to aim for a minimum of 40% recycling/composting of household waste by the end of 2004, and seeking to achieve 60% by 2007. Progress will be reviewed and a detailed plan for dealing with the residual waste will be developed by the WDA/WCAs in October 2001".

4.57 These County Wide targets contained in the emerging Waste Local Plan are significantly more challenging than those set out in WS2000. However, preliminary results from two high-diversion trials presently taking place in Witham and West Mersea indicate that the local targets are capable of being achieved.

4.58 The Environment Transport and Regional Affairs Committee⁵⁸ reported the success of the West Mersea scheme as:

Returns from the first three months indicate that a recycling rate of 57% is being achieved through these services with the kerbside services collecting the equivalent of 0.44 tonnes per household for recycling and 0.18 tonnes per household for composting.

4.59 More recently the guidance published by the Scottish Environmental Protection Agency has been reported as⁵⁹:

"The SEPA guidance means that such incinerators are unlikely to be included in the 11 area waste plans being drawn up by local authorities to govern future waste disposal. It acknowledges that "significant concern remains in the public perception of incineration", which was regarded as "a dirty technology with serious potential health risks"."

Other Incineration Bans

4.60 When a technology or disposal method has been banned in other countries or jurisdictions then it is entirely reasonable that local residents who face a new – or replacement – proposal should be particularly concerned about the risks to which they would be exposed.

4.61 There have been incineration bans in several countries including:

- West Virginia, USA 1993 West Virginia Law HB 2445: "it shall be unlawful to install, establish or construct a new municipal or commercial solid waste facility utilizing incineration technology for the purpose of solid waste incineration."

⁵⁸ House of Commons - Environment, Transport and Regional Affairs - Fifth Report

⁵⁹ SEPA rules block new incinerators The Scotsman Alastair Dalton Science Correspondent Saturday, 1st September 2001

- Rhode Island, USA 1992 Rhode Island's State Senate Act 92-S 2502: ". . .incineration of solid waste is the most costly method of waste disposal with known and unknown escalating costs which would place substantial and unreasonable burdens on both state and municipal budgets to the point of seriously jeopardizing the public's interest."
- Delaware, USA 1998 SB 98: This bill bans garbage incineration in Delaware's "Coastal Zone."
- City of Berkeley, California, USA - banned waste incineration in 1991 following overwhelming public support for recycling. Although subsequently subject to a series of legal challenges this ban has recently been upheld
- Costa Rica 1999 Presidential decree banning incineration
- The Philippines 1999 The Clean Air Act explicitly bans all types of waste incineration

4.62 Some authorities also place restrictions on the siting of incinerators in relation to residential properties. Outside the coastal zone Delaware law requires⁶⁰, for example, that:

"2) No permit may be granted to any incinerator unless:

a. The property on which the incinerator is or would be located is within an area which is zoned for heavy industrial activity and shall be subject to such process rules, regulations or ordinances as the county, municipality or other government entity shall require by law, such as a conditional use, so that conditions may be applied regarding the health, safety and welfare of the citizens within the jurisdiction; and

b. Every point on the property boundary line of the property on which the incinerator is or would be located is:

- 1. At least 3 miles from every point on the property boundary line of any residence;*
- 2. At least 3 miles from every point on the property boundary line of any residential community; and*
- 3. At least 3 miles from every point on the property boundary line of any church, school, park, or hospital."*

4.63 It is entirely reasonable in these circumstances for the residents of Sheffield to be concerned about the safety of incineration in these circumstances and to ask why are the residents of these other states and

⁶⁰ <http://198.187.128.12/delaware/lpext.dll?f=templates&fn=fs-main.htm&2.0>

Countries afforded a higher degree of protection than they are afforded by their own local authority.

The Environment Agency Position Paper on Waste Management

4.64 So great is the Ministerial concern about the levels of the targets set in WS2000 that a 'Waste Summit' was held on 21st November 2001 and chaired by Margaret Beckett.

4.65 The Environment Agency submission to the summit raises some important and material issues. It was announced after the Waste Summit that the National Waste Strategy is to be immediately reviewed by the Cabinet Office Performance Innovation Unit (PIU). Their report is expected by the summer.

4.66 Perhaps most significantly the Environment Agency Position paper supported 'zero waste' as a target:

'OUR VISION A long-term goal of zero waste production'

4.67 Sheffield could not be part of that vision if this proposal proceeds as the incinerator would have to be 'fed' waste over the full operating life. This seriously undermines the opportunities - and the incentives - for achieving 'Zero Waste'.

4.68 The Environment Agency outlined a 10 point plan:

1. Focus on the environmental outcomes to be achieved

2. Increase economic incentives and align them with the policy aim of minimum environmental impact

3. Develop effective waste strategies that place community engagement centre stage

4. Adopt more ambitious recycling targets

5. Improve the market for recycled materials

6. Impose reduction and recycling targets for businesses and environmental accounting of waste and resource productivity

7. Keep waste management options open by avoiding long-term commitments to technologies low down the waste hierarchy.

8. Improve strategic waste planning and development control processes

9. Make funding available for regular waste production surveys and dissemination of the information obtained

10. *Establish an independent strategic waste and resource management research centre*

4.69 Those of most relevance to the Sheffield proposal are underlined. Of particular concern are the dangers of undermining recycling by inappropriately sized incinerators:

7. Waste disposal sites such as landfills and incinerators are deeply unpopular with the public. If badly sited or sized they can undermine the drive to more sustainable waste management options further up the hierarchy and fail to maximise energy (heat) recovery.

We recognise that both landfill and incineration will continue to have roles to play within an integrated strategy for waste management. Where incinerators are needed, they should be appropriately sized to avoid competition with recycling and sited so that energy recovery is economically possible. This will also keep waste management options open by avoiding long-term commitments to technologies low down the waste hierarchy. We agree that energy from mixed waste incineration should be excluded from the Renewables Obligation.

Emissions

4.70 There has been no comparison in the application of the relative quantum of emissions from the proposed incinerator. These are:

- NO_x 224,204 kg/annum
- Particulates 11,225 kg/annum

4.71 There is little practical experience in the UK of operating incinerators to the 200 mg/m³ Waste Incineration Directive standard for nitrogen dioxide. Most of the existing plants – including the Sheffield plant - have been regularly failing to meet their current IPC authorisations of an average of 350 mg/m³. NO₂ emissions are therefore likely to be very close to the predicted emission levels and, given that NO UK incinerator has been fully compliant with IPC authorisation emission standards conditions it is very likely that this proposal would also breach emission limits.

4.72 Assuming that the plant was completed by 2005 and then operated over a 25 year life the total emissions from the plant would be:

- NO_x 5,605,000 kg
- Particulates 280,000 kg

4.73 These can be compared with emissions from cars which are⁶¹:

Euro Standard	Number of seats	Fuel	Directive	Limit values (gm/km)					Implementation Dates	
				CO	HC	NOx	HC+NOx	PM	Type Approval	In-use
Euro II	up to 6	P	94/12/EC	2.2	-	-	0.5	-	01/01/96	01/01/97
	up to 6	D	94/12/EC	1	-	-	0.7	0.08	01/01/96	01/01/97
	up to 6	D(di)	94/12/EC	1	-	-	0.9	0.1	01/01/96	01/01/97
Euro III	up to 9	P	98/69/EC	2.3	0.2	0.15	-	-	01/01/00	01/01/01
	up to 9	D	98/69/EC	0.6	-	0.5	0.56	0.05	01/01/00	01/01/01
	Note (i)	D	98/69/EC	0.8	-	0.65	0.72	0.07	01/01/01	01/01/01
	Note (ii)	D	98/69/EC	0.95	-	0.78	0.86	0.86	01/01/01	01/01/02
										01/01/02

4.74 Comparing emissions from the incinerator with distances travelled indicates that for NOx the incinerator would be the equivalent of 1,475,000,000 km at the Euro III standard or, assuming that the total NOx and HC limit of 0.5 g/km was made up of NOx of 442,000,000 km at the 1996/97 standards.

4.75 This would be the equivalent of the average family⁶² in Sheffield adding another 12,200 km to their annual driving to generate the equivalent mass of NOx. Clearly the emissions from the incinerator are dispersed over a wider area because the release point is the top of the stack but these comparators help to show what a huge single source of pollution the incinerator represents - an impression that is deliberately diluted with the quantification as mg/m³ of emissions and µg/m³ of diluted ground level concentrations and without any reference to the quantum of total emissions from the proposal.

4.76 As a simple guide every tonne of waste incinerated would generate over 1kg of NOx - the equivalent to the emissions from a new car travelling over 6,600 km.

4.77 There is significant public concern nationally and locally about asthma, health and respiratory problems linked to air pollution. Incinerators add a new dimension to traditional air pollution concerns with the fear of

⁶¹ Department of the Environment, Transport and the Regions New Car Fuel Consumption and Emissions Figures: January 2000 <http://www.detr.gov.uk/roads/vehicle/fuelcon/4.htm>

⁶² With a population of 530,100 and family size of 4.4

carcinogenic emissions. Recent press coverage has helped to keep these concerns live with reports, for example, that researchers estimate that just 23% of cancers are linked to hereditary factors. Reporting the research by Paul Lichtenstein of Sweden's Karolinska Institute ENDS wrote⁶³ that "*The environment, rather than hereditary factors, is the overwhelming cause of human cancers, according to one of the most exhaustive ever epidemiological studies*". This report has been published at the same time as the popular press reported on studies by Knox⁶⁴ finding a 100% increase in risk of child cancers/leukaemia within 5 km of the municipal waste incinerators he studied (see below).

High Profile News Items

4.78 The influences noted above are likely to have raised – and to justify – significant levels of public concern. There have also been a range of high profile news items that would exacerbate that concern for residents potentially affected by this application. These include:

The Byker Incinerator:

4.79 The Byker incinerator has been operated under an IPC authorisation and regulated by the Environment Agency. In spite of this it has resulted in what may turn out to be the worst example of dioxin contamination in the UK with ash being disposed of on local allotments until 1999.⁶⁵ The Minister was questioned about this on Radio 4, for example:

Presenter to MM: "Now, therefore what you are saying is that you will protect the countryside from pollution and poisonous emissions because if we look at the Byker incinerator in Newcastle, ash from that incinerator was used on allotment paths. This morning comes confirmation that tests show that that ash contained raised levels of dioxins and heavy metals - 800 times safety levels. People there are being advised that children under three shouldn't be allowed to play in the affected sites and vegetables and other produce off those sites shouldn't be eaten. That's not safe. How do you stop this kind of thing happening?"

Michael Meacher MP: "I am very concerned about what has happened in Newcastle because the procedure is, if those operating the incinerator wish to use the bottom ash for a particular purpose, they have to get the agreement of the

⁶³ ENDS Daily Environment "causes most human cancers" 14/07/00

⁶⁴ Childhood cancers, birthplaces, incinerators and landfill sites. Knox E Int J Epidemiol 2000 Jun;29(3):391-397

⁶⁵ Media Transcription Services, Transcript - Ref. No.: 6815 BBC Radio-4 "You and Yours" Thursday 25th May 2000

Environment Agency. Now, in this case it certainly does appear that the levels of contamination, of particular dioxin contamination, are far higher than they should be and I have demanded to have at the earliest moment a full report explaining how that can possibly have happened. That is not, of course, in agreement with the Consent. Something has gone wrong and I want to find out what it is and make sure it doesn't happen again."

- 4.80 This incident – which has caused an uproar of local concern in Newcastle – provides a striking example of the failings of the current systems and the inadequate protection that is offered by the Environment Agency. It may be claimed that similar problems would not arise in Sheffield – but that is unlikely to be reassuring. The residents of Newcastle were repeatedly assured that the incinerator was ‘safe’ and properly regulated⁶⁶ but it was only after residents investigated the plant themselves that the problems were acknowledged and the full extent of the contamination became apparent.
- 4.81 Investigations of the area around the incinerator have shown that not only is there severe contamination in the allotments upon which ash has been spread but sites close to the incinerator also have elevated levels of dioxin in spite of having received no ash.
- 4.82 The Byker incident has also helped to highlight the general lack of control by the Environment Agency of the ‘reuse’ of ash which presents a major pathway for contaminants into the environment. Until very recently fly ash and bottom ash was being mixed together at the Edmonton⁶⁷, and possibly other, incinerators and was then used for road construction without the Environment Agency collecting any data on the levels of contamination.

⁶⁶ The reassurance given is not dissimilar to that from the Chief Executive to residents of Sheffield at the Cabinet meeting of 2nd July 2001, in response to a question about whether the City Council would commit itself on behalf of the residents of Sheffield, to a safe closure of the Bernard Road Incinerator plant and, if this was the case, give details as to how they would ensure it would happen.

In response the Chief Executive expressed the view “that the existing incinerator at Bernard Road had been declared safe by both the Environment Agency and the National Society for Clean Air. He added however that the Authority would continue to work to ensure that the incinerator was operated at even safer levels and that this activity would include encouraging Onyx to monitor and operate the incinerator in an increasingly safe manner.” No mention was made of the fact that the incinerator could not even comply with the current rather lax authorization having breached its legal limits on aerial emissions at least 178 times in the past three years. Nor that it was incapable of being upgraded to meet the standards now required of new plant – which are still less stringent than those required in parts of Europe for a decade.

⁶⁷ Agency and incineration firm face flak over fly ash recycling, ENDS 311, December 2000

- 4.83 The reporting on Newsnight (4/7/01) of mixed ash with high dioxin concentrations from the SITA Edmonton plant being used in buildings will have further increased anxiety about future ash disposal routes. Particularly as it seems that the Minister had inadvertently misled Parliament by relying upon an Environment Agency briefing about levels and information available about contamination.
- 4.84 This was followed by a subsequent Newsnight Report indicating that huge piles of incinerator ash had been left exposed to the wind in East London because there had been no market for them following increased concerns from the construction industry. This raises serious doubts about the final disposal of the ash from this plant as the Environmental Statement is particularly vague on the question of possible 're-use'.

Belgian Dioxin Contamination:

- 4.85 In early 1999 contaminated animal feed caused dangerously high levels of dioxins in Belgian chicken meat and eggs - a food scandal which led to the products being banned throughout Europe and the resignation of two government ministers.
- 4.86 ENDS reported⁶⁸ that *"The potency of dioxins has been powerfully illustrated by the recent examples of egg and poultry contamination in Belgium where the Belgian government fell and Belgian poultry exports were decimated as the result of a small quantity of dioxin/PCB contaminated feed"* .
- 4.87 The Belgian public first became aware of the health risks posed by the cancer-causing contaminants at the end May when the government instructed shops to remove Belgian eggs and chicken from the shelves and warned consumers not to eat any such products they may have already bought. The ban spread to the entire EU on 2nd July 1999 when the European Commission's veterinary committee decreed that all poultry products from the farms believed to have used the contaminated feed should be destroyed. Belgium was only allowed to export poultry certified as coming from unaffected farms.
- 4.88 The health minister Marcel Colla and the agriculture minister Karel Pinxten both resigned, amid accusations that they had delayed taking action to protect public health despite knowing about the contamination for about a month. The Belgian government was similarly criticised by acting EU farm commissioner Franz Fischler who said Belgium should have informed the Commission of the problem as soon as it knew about it.

⁶⁸ ENDS Daily - Belgian dioxin contamination traced to feed 02/06/99

- 4.89 This was a striking example of how a very small quantity of dioxin could destabilise the whole agricultural economy of a country and the Government subsequently lost the next election as a result of their handling of the scandal giving dioxin an even higher profile.

French Incinerator Contamination:

- 4.90 ENDS reported⁶⁹ that three French municipal waste incinerators have been ordered to close after elevated levels of dioxins were discovered in milk from cows grazing near one of the plants. French environment minister Dominique Voynet has supported the move and demanded immediate action to ensure that other incinerators in France comply with legal standards.
- 4.91 The three incinerators affected are in the area of Lille, close to France's northern border with Belgium. On 21 January, the Nord Pas de Calais prefecture (regional authority) learned of tests showing that milk from cows grazing from 250 metres to 1km from the Halluin municipal waste incinerator had up to three times the admissible levels of dioxins. On Tuesday, the Communauté urbaine de Lille, which covers Lille and its immediate region, ordered the closure of Halluin, along with two neighbouring incinerators at Wasquchal and Sequedin.
- 4.92 Voynet has since increased taxes on incineration⁷⁰ and targeted a stabilisation of waste incineration, having criticised waste plans for emphasising incineration to the detriment of recycling.
- 4.93 Those concerns have been exacerbated by more recent work in Spain. A study⁷¹ of a new Spanish incinerator has found that the local population has suffered an increase in dioxin levels in their blood.
- 4.94 Dioxin levels were found to be 13.5ng/kg of body fat before the plant opening, slightly below the 15ng/kg fat to be expected in a non-exposed population. Two years afterwards, dioxin and polychlorinated biphenyl levels had risen by 25% and 12% respectively, although the increase in

⁶⁹ ENDS Daily, Dioxin alert shuts French waste incinerators 29/01/98

⁷⁰ ENDS Daily Voynet wins greener French waste policies 31/08/98

⁷¹ Biomonitoring study of people living near or working at a municipal solid waste incinerator before and after two years of operation, Carlos Gonzalez et al. archives of Environmental Health July/August 2000, vol 55 no 4 pp259/267.

dioxin levels dropped to 10% when two additional checks were carried out. Blood lead levels and other heavy metals remained unchanged.

- 4.95 The researchers could suggest no alternative source of dioxins apart from the new incinerator, but stated that the extremely low emissions of the incinerator, and the fact that there was no difference in exposure between those living close and those living further away, suggested that the increase was unlikely to be caused by incinerator emissions. The absence of any other plausible sources is likely to further undermine public confidence that the actual emission levels are as low as the operators claim – especially as there is a persistent refusal to include continuous emissions testing for dioxins.

Fish Dioxin Contamination in the UK

- 4.96 MAFF found in 1999 that people who eat fish more than twice a week are likely to exceed World Health Organisation recommended dioxin and PCB intakes. ENDS reported⁷² that

“MAFF chose not to publicise the study’s findings and the report simply appeared on its web site in early August....the unspoken conclusion of the study is that it would be unwise to eat oily fish any more frequently, and children should be even more careful to limit their fish consumption”.

- 4.97 More recently these findings have become the subject of some high profile documentary programmes and the controversy has received a great deal of press coverage.

USEPA dioxin review:

- 4.98 On 17th May 2000 the Washing Post⁷³ reported that they had obtained a leaked copy of the revised and long awaited United States Environmental Protection Agency study on dioxin:

“The Clinton administration is preparing to dramatically raise its estimate of health threats from dioxin, citing new evidence of cancer risk from exposure to the toxic chemical compound”

- 4.99 The USEPA concluded, inter alia, that:

⁷² ENDS, MAFF survey shows health threat from dioxins in fish, ENDS report 295, August 1999. 13-14.

⁷³ Cindy Skrzycki and Joby Warrick, EPA Links Dioxin to Cancer Washington Post 17 May 2000; Page A01

"upper bound cancer risks from average current background body burdens (5 ng/kg BW) resulting from average intakes of approximately 3 pgTEQ/kgBW/day are in the range of 10⁻³ to 10⁻²."

4.100 This is expressed more clearly in the summary of the External Scientific Peer Reviewers⁷⁴ as:

"Using best available estimates of cancer risks, the [upper bound general population] risks might be on the order of 1 in 1,000 to 1 in 100."

4.101 The implications are that suggest that roughly 64,000 cancer deaths in the United States each year can be attributed to current levels of dioxin exposure – these are broadly similar to the UK. Impacts of this order from current exposures clearly undermine any reliance on a ‘margin of safety from new exposures’.

4.102 The USEPA work was widely reported in the UK and is specifically referenced in the Conservative Party policy document (see above). The draft report has now been published by the USEPA for public comment and the preliminary conclusions, which are not reassuring about health risks, are reported in the following chapters.

Danish EPA dioxin review:

4.103 The results presented in a new study from the Danish EPA⁷⁵ shows that incineration plants are still the major source of dioxin emissions.

4.104 A Danish EPA study gives for the first time a complete picture of the circulation of the toxic substance dioxin and of its origin. Danish EPA Deputy Director General Helge Andreasen said:

"We have never before taken this approach to assessing releases of dioxin and their sources. Therefore our overall estimates of atmospheric releases are higher than earlier assessments. Today we know more than five years ago. The study is therefore a valuable tool in our future work. Significant efforts have already been made to reduce emissions of dioxin from our waste incineration plants. Thus, the new plants use dioxin filters, and today dioxin is removed in 1/5 of the total incineration capacity. The study underlines that dioxin filters and best available technology must be introduced as soon as possible",.

⁷⁴ Final, 24 August 2000, REPORT ON THE PEER REVIEW OF THE DIOXIN REASSESSMENT DOCUMENTS: TOXICITY EQUIVALENCY FACTORS FOR DIOXIN AND RELATED COMPOUNDS (CHAPTER 9) AND INTEGRATED RISK CHARACTERIZATION DOCUMENT

⁷⁵ E Hansen. Substance Flow Analysis for dioxins in Denmark, Environmental Project No 570, 2000. Danish Environmental Protection Agency

The Environment, Transport and Regional Affairs Committee

4.105 The Environment, Transport and Regional Affairs Committee (ETRAC) has published its report 'Delivering Sustainable Waste Management'⁷⁶ after the most detailed recent parliamentary scrutiny of the issue. The Committee has issued a set of damning conclusions which are certain to make the public more risk adverse and to affect commercial inward investment decisions in the vicinity of incinerators. Their conclusions include:

- *"We believe that incineration will never play a major role in truly sustainable waste management"*
- *"There should be a tax on incineration".*
- *"The kerbside collection of source-separated waste is a necessity"*
- *"The 30% and 33% recycling targets for 2010 and 2015 are 'depressingly unambitious'." Government must set higher recycling targets of 50% by 2010 and 60% by 2015 to show there is not a ceiling on recycling and composting potential.*
- *"The Environment Agency told us, more generally, that our understanding of the health effects of air pollution is "at an early stage."*
- *"The Government has also failed to rise to the challenge of analysing and communicating the risks from incinerators"*

4.106 In relation specifically to public concern and anxiety the Committee concluded:

"Whatever the quality of emissions regulation and emissions reduction equipment, poor management, poor regulation and poor operating practices can produce a real health risk from an incinerator. The arguments about the health effects from incinerators are complex. There are, however, some truths which can be drawn from the debate over the health impacts of incineration. Firstly, that the health effects which result from an incinerator's emissions are not yet fully known. Secondly, that the regulation of incineration to date has been rather poor and that this has resulted in poor practices developing in some incinerators. This, in turn, has raised the levels of anxiety amongst the public. "

4.107 This undoubtedly has land use implications whilst being a cause of adverse health effects in its own right⁷⁷.

⁷⁶ Environment, Transport and Regional Affairs Committee's Fifth Report on Delivering Sustainable Waste Management HC36-I 21st March 2001

⁷⁷ See, for example, McCarron P, Harvey I, Brogan R, Peter TJ. "Self reported health of people in an area contaminated by chromium waste: interview study". BMJ 2000; 320 11-15

5. Best Practicable Environmental Option - BPEO

“The best practicable environmental option in the vast majority of cases is recycling.”

Environment Minister Michael Meacher⁷⁸

5.1 BPEO now represents the central determinant in relation to waste applications. Following the decisions in *R v Bolton MBC ex parte Kirkman*, (High Court⁷⁹ and Court of Appeal⁸⁰) the proper determination of BPEO has been required by the Government in PPG10 and WS2000.

5.2 Government guidance in WS2000, which is the Article 7 plan ‘made under the plan making provisions’⁸¹ and which must be implemented as a ‘Relevant Objective’ requires that waste management decisions should be based on four principles. These are:

- Best Practicable Environmental Option (BPEO),
- Regional self sufficiency
- the proximity principle and
- waste hierarchy.

5.3 These requirements are also included in PPG 10⁸² 'Planning and Waste Management' (PPG10) at paragraph 6.

5.4 The WS 2000 requirement to consider BPEO is direct and phrased in mandatory form.

“The technique that should be used for making waste management decisions is known as best practicable environmental option (BPEO);”⁸³ and

“The process that should be used for considering the relative merits of various waste management options in a particular situation is the best practicable

⁷⁸ Evidence given to the Environment Transport and Regional Affairs Committee on 12/12/00 – available at

<http://www.publications.parliament.uk/pa/cm200001/cmselect/cmenvtra/uc36/3602.htm>

⁷⁹ [1998] J.P.L 787

⁸⁰ [1998] J.P.L 802

⁸¹ WMLR 1994 Sch4 para 4(1)(b)

⁸² PPG 10 DETR (September 1999)

⁸³ Waste Strategy 2000, Part 2, para. 3.2.

environmental option (BPEO)”.⁸⁴

- 5.5 Furthermore WS 2000 introduces the section on ‘Determining the Best Practicable Environmental Option’⁸⁵ with the emphatic requirement that:

*When taking waste management decisions on suitable treatment options, sites and installations, local authorities **must** follow the framework set out below. (**my emphasis**)*

- 5.6 The reason for the force of the statement is explained in WS 2000:

If we are to manage our waste more sustainably, decision makers need the tools to move us in that direction. Waste is not a single substance, and its management is not a series of simple choices. Rather it is, for the most part, a complex mixture of different materials, in differing proportions. Each of these materials has the potential to impact differently on the environment. Environmental impact can also be influenced by the collection system used, the locations where waste is generated, managed and disposed of, and the resources consumed through managing our waste. In a sustainable and integrated system all these factors must be taken into account when making decisions on how best to manage waste.

- 5.7 The strategy then outlines in some detail how the BPEO should be determined including a breakdown of how the assessment should be approached⁸⁶:

Step 1: set the overall goals for making the waste management decision, subsidiary objectives and the criteria against which the performance of different options will be measured

Step 2: identify all the viable options

Step 3: assess the performance of these options against the criteria

Step 4: value performance

Step 5: balance the different objectives or criteria against one another

Step 6: evaluate and rank the different options

Step 7: analyse how sensitive the results are to variations in the assumptions made or the data used.

- 5.8 It is also clear that the assessment of Best Practicable Environmental Option (BPEO) is an holistic process. The definition introduced by the Royal Commission on Environmental Pollution in their 12th Report “Best

⁸⁴ Waste Strategy 2000, Part 2, para. 3.4.

⁸⁵ Waste Strategy 2000 Part 2, Chapter 3, page 27

⁸⁶ Waste Strategy 2000, Part 2, Chapter 3 page 29 para 3.10

Practicable Environmental Option” is adopted both in PPG 10⁸⁷ and ‘Waste Strategy 2000’⁸⁸:

“A BPEO is the outcome of a systematic consultative and decision making procedure which emphasises the protection and conservation of the environment across land, air and water. The BPEO procedure establishes, for a given set of objectives, the option that provides the most benefits or least damage to the environment as a whole, at acceptable cost, in the long term as well as in the short term”

5.9 The approach of Onyx to the role played by BPEO is, at best, unclear. The Planning Supporting statement⁸⁹ says:

“Insofar as it was chosen by elected members of the City Council following a systematic and detailed assessment of alternatives proposed by other companies, the particular set of techniques forming Onyx’s integrated waste management proposals for Sheffield can be said to be the Best Practicable Environmental Option (as defined in PPG10 (Planning and Waste Management)).”

5.10 And, at 4.49- 4.50, which are the only paragraphs in the section on BPEO:

4.49 At national or regional level the BPEO will be determined by comparing a number of generic waste management strategies comprising one or more process operations. Typically these may include one or a combination of the following strategies: landfill; recycling; incineration; composting or anaerobic digestion.

4.50 The ERF as part of the entire integrated waste management strategy, incorporating recycling and composting within the City can be considered as the BPEO, as it is the most favourable option above disposal of waste in landfill. The IWM strategy for Sheffield has been identified following a systematic consideration of other approaches.

5.11 This argument would be more convincing if it the Council had finished preparation of the Municipal Waste Strategy which the Government expects every authority in England to have. However the Best Practicable Environmental Option requires the **optimum** environmental solution, not one that might simply be analysed as satisfactory. The approach adopted in the application is an attempt by the applicant to dilute the importance

⁸⁷ PPG 10 Box 1

⁸⁸ WS 2000, Part 2, Chapter 3, para 3.4

⁸⁹ Planning Supporting Statement para 3.9

of BPEO by suggesting that it has only an ancillary role in the planning control process, and that it is an assessment which has already been carried out by others. This is to wholly misinterpret the manner in which waste policy has now changed. Furthermore the argument that that the contractual decision necessarily represents BPEO has been tested at a public inquiry held in 2001 in relation to a landfill site at Sandon, Essex. The Inspector concluded that it cannot be claimed that the contractual arrangement secures BPEO.

- 5.12 What government is urging planning authorities and decision makers to do in Waste 2000 (based on a long emerging trend) is to require the most sustainable environmental option to be placed in front of mere economic or disposal expediency. Waste Strategy 2000 is about "*Changing the way we manage waste and resources*".⁹⁰ This means identifying a particular waste stream, understanding and describing its composition, and then empirically demonstrating that a site specific proposal is the best (not just one option) environmental means of dealing with that particular waste stream. Furthermore the process by which this is arrived at must be a "*systematic consultative and decision making procedure which emphasises the protection and conservation of the environment across land, air and water*".
- 5.13 In the absence of any supporting documentation or BPEO report accompanying the application there is absolutely no evidence that the tender selection process has met this criteria - indeed the whole process was carried out behind closed doors and with no public consultation. Moreover it is clear from even a superficial review of those few tender documents which have since been made available to the public that the assessment of BPEO was not an important issue in the tendering process. The main emphasis in the tender documents - which do not even define BPEO in the glossary - seems instead to have been to achieve recovery of the £ 28.6 million wasted costs of the upgrade of the current incinerator
- 5.14 The strategic objectives of the contract were adopted at the City Council meeting on 14th September 1999 and these made to mention of BPEO. Cost was certainly a key matter as was the requirement that:
- "in pursuing these objectives to achieve an approach which encompasses a clarity of approach within best value principles and secures the long term funding of the £ 28.6 million project costs of the incinerator upgrade."*

5.15 Furthermore the 17th May 2000 KEY ISSUES FOR THE COUNCIL Report by the Chief Executive⁹¹ highlights as a key issue:

"the dependence on the successful completion of the waste management strategy to deliver funding for the capital costs of the incinerator".

5.16 Furthermore para 1.6.5 of the 'Instructions to Negotiate' says:

....The City Council will be seeking reimbursement of £ 28.6 m in respect of the incinerator upgrade for the Municipal Waste Incinerator

and

2.6.1 It is essential that the assets provided, constructed or improved under the contract can be treated by the City Council as off balance sheet.

5.17 The provision of BPEO, by contrast is, not included as a requirement at any stage in the documents that have been made available to the public. The Output specification for the Integrated Waste Management Contract⁹² requires only that the WS 2000 targets are included in the 'Mandatory Reference Bid'. However it is notable that the Planning Supporting Statement gives no indication of how those targets can possibly be met with such a large incinerator (see below).

5.18 This approach is not in accordance with Government policy as expressed in WS 2000 and reinforced more recently by the DETR⁹³:

"The government is clear that increased recycling is necessary. It wants to see authorities and businesses pushing the boundaries of what is achievable, and the waste and resources action programme is a key element in this process. But what happens locally is determined on the basis of the best practical environmental option (BPEO) and will therefore vary from place to place." (my emphasis)

5.19 It would be completely irrational to argue that 18% recycling was 'pushing the boundaries of what is achievable' or that it could possibly represent BPEO for the domestic waste stream of 'Recycling City' Sheffield. Any such arguments should be tested against the conclusions of the Environment Transport and Regional Affairs Committee conclusions (as above) that *"The 30% and 33% recycling targets for 2010 and 2015 are '*

⁹¹ RK/SC - Report16 - Revised 17/5/00

http://www.sheffield.gov.uk/townhall/Committee_Secretariat/Scrutiny_Boards/Strategic_Planning_Performance/Reports/20000623/KEY_ISSUES_CABINET_REPORT_562000.htm

⁹² Output specification for the Integrated Waste Management Contract , volume 3 Part 1 para 2.2.3

⁹³ Environmental protection information: Guidance on Municipal Waste Management Strategies DETR March 2001 paragraph 5.4 page 13

depressingly unambitious'." Government must set higher recycling targets of 50% by 2010 and 60% by 2015 to show there is not a ceiling on recycling and composting potential"

5.20 Waste Strategy 2000⁹⁴ provides as follows:

"In determining BPEO we will expect those making decisions to take account of three key considerations:

The waste hierarchy

Within the hierarchy the government do not expect incineration with energy recovery to be considered before the opportunities for recycling and composting have been explored.

The proximity principle

The proximity principle requires waste to be disposed of as close to the place of production as possible. This avoids passing the environmental costs of waste management to communities which are not responsible for its generation, and reduces the environmental costs of transporting waste.

Self sufficiency

.... Waste planning authorities and the waste management industry should aim, where practicable, for regional self sufficiency in managing waste."

5.21 It is therefore necessary to assess the current proposal against the three key considerations identified in Waste 2000 – in particular the waste hierarchy.

The waste hierarchy

5.22 It is quite clear from the text of paragraph 4.5 of Part 1 of Waste Strategy 2000, and from paragraph 2.19 (page 18) of the same part of the Strategy, that opportunities for recycling must be taken before waste is incinerated. There is no obvious attempt to incorporate recycling into the current proposals.

5.23 Whilst it is claimed that a 'major new' MRF would be constructed at Beighton there is no detail as to possible design, capacity, efficiency or

⁹⁴ Waste Strategy 2000, Part 1, para. 4.5 at page 42

integration with the current proposal included in the Environmental Statement. The Draft MSW Strategy indicates⁹⁵, however, that:

Onyx are contracted to build a Material Recovery Facility (MRF) at the Beighton Road Depot, within the existing building. The MRF is planned to open in September 2003, and will have a design capacity of 25,000 tonnes to deal with co-mingled paper and card (newspapers and magazines, brown corrugated card and mixed papers/grey card) from source segregated kerbside collection schemes.

.....

The MRF proposal is based on the assumption of 95% of throughput being marketable with a 5% residue probably going to landfill.

- 5.24 This shows that the recycling performance is likely to be, at best 95% of 25,000 tpa which is 23,750 tpa from the MRF. This evidence also indicates that the residuals from the MRF are likely to be disposed of directly to landfill and not integrated with the incinerator as suggested in Figure 1.3 of the Planning Supporting Statement.
- 5.25 Other than the fact that this is not a landfill proposal therefore, the incinerator does nothing to push waste disposal in Sheffield up the waste hierarchy. If anything, the operation of the incinerator is likely to damage the future waste disposal activities in the City.
- 5.26 Waste Strategy 2000 says that “Energy from waste plants should be appropriately sized” and warns against incineration “crowding out” recycling.⁹⁶ This is interpreted in the Planning Supporting Statement as:
- 2.18 The main concern in sizing the new ERF plant is to ensure that its capacity diverts waste away from options below the ERF in the waste hierarchy (e.g. landfill, incineration without energy recovery) rather than from options higher in the waste hierarchy (e.g. recycling)*
- 5.27 This is helpful in so far as it clarifies that Onyx accepts that incineration is below recycling in the waste hierarchy. It has been clarified in the “Best Value” guidance that waste which is incinerated cannot be classed as being recycled or reused. This is entirely reasonable given that even bottom ash is contaminated and presents environmental hazards; metals recovered post incineration are also badly contaminated and are of very

⁹⁵ A MUNICIPAL WASTE STRATEGY FOR SHEFFIELD -REPORT OF HEAD OF ENVIRONMENT & REGULATORY SERVICES Report to Cabinet 10th December 2001 – note that the strategy was dated October 2001 but only went to Committee for approval in December.

⁹⁶ Waste Strategy 2000, Part 1, para. 2.23 at page 19

low value and the air pollution control residues are 'special wastes'. and there is a very real danger, therefore, that a 225,000 tpa incinerator would prejudice recycling in Sheffield.

5.28 The assumptions used by the applicant to justify this capacity of plant include that:

- Both household and commercial waste collected by Onyx will grow at 2% per annum until 2005/⁹⁷ This is in spite of the Government's position in WS 2000 that 2.43 *Tackling the growth in waste is an essential element of this strategy.* and the success in achieving waste minimisation claimed by Onyx in the application.
- There is no 'by-pass' waste from the incinerator. By contrast when acting as consultants on the similar 225,000 tpa plant at Ridham (for SITA) ERM included 15,000 tpa by-pass
- Upto 67% of the municipal waste collected would be incinerated.

5.29 The result of these assumptions is that the capacity in the ERF plant for household waste would be reduced to "possibly as low as 192,000 tonnes per annum". This would be out of total arisings of 265,000 tpa i.e. at the best 27.5 % of the waste stream would be left for recycling.

5.30 If incinerator bypass is subtracted and the residues from the Beighton MRF then this leaves only 23% total for recycling. It is inconceivable that more than 95% of this could be recycled so accepting this incinerator condemns Sheffield to a recycling rate of less than 22%. Lower than the target set in Waste Strategy 2000 for 2005. Higher rates than the 18% Best Value level (which is plotted at the same level through to 2020 on Figure 2.4) are described as 'aspirational' even though they are explicitly included in the National Strategy and it is very likely that the next revision of 'Best Value' targets will make them statutory.

5.31 The Environment Agency Strategic Waste Management Assessment⁹⁸ gives a useful indication that the higher the level of recycling the lower the environmental externalities in the comparative exercises. The Environmental effects of the higher recycling option outperform incineration for all four categories reported (air acidification, depletion of non-renewable resources, greenhouse effect and photochemical oxidant formation). These assessments are made on a 'best case' scenario (for incineration) of the displaced electrical generation being coal fired and

⁹⁷ para 2.21 Planning Supporting Statement

⁹⁸ page 52 Strategic Waste Management Assessment 2000: Yorkshire and The Humber

thus more polluting. If the displaced generation was gas or renewable then the higher recycling options would score even higher.

- 5.32 The conflict with the achievement of recycling levels that faces Sheffield was specifically recognised by the Environment, Transport and Regional Affairs Committee has published its 5th report 'Delivering Sustainable Waste Management'⁹⁹

"The nature of incineration is such that it can 'crowd out' recycling: if a significant number of large incinerators, operating on long contracts, are allowed to be built, the long-term prospects for recycling will be diminished. The real challenge, then, is to keep the contribution of incineration to a reasonable level. For this reason, the Government should consider how to ensure that incineration is used only for sorted waste from which materials of value have been reclaimed. Further, the average size of incinerator currently planned is too large and the Government must offer a clear signal that the building of incinerators above a capacity of 100,000 tonnes per annum is unlikely to be approved."

- 5.33 The evidence by the Chairman of the Energy from Waste Association to an earlier¹⁰⁰ Environment, Transport and Regional Affairs Committee agreed that it was vital not to oversize incinerators:

Mr Chilton considered the establishment of very large incinerators to be fundamentally wrong since it assumed that "recycling will not develop...[and] that waste arisings will either remain static or keep growing". Instead, he argued that there should be a guaranteed minimum input of waste to satisfy financiers. "set at a level that allows maximum flexibility for all the other options to be fully developed"; he suggested that this level might be approximately half the tonnage of waste arising in the locality.¹⁰¹

- 5.34 It is concluded, therefore, that the incinerator is too big to allow more than a maximum of about 22% recycling and that there is no evidence that a best practicable environmental option assessment has been carried out. As this is a key consideration for any waste proposal then in the absence of proper supporting evidence that the incinerator represents BPEO for the Sheffield waste streams it is proposed to burn then the application should be rejected.

⁹⁹ Environment, Transport and Regional Affairs Committee's Fifth Report on Delivering Sustainable Waste Management HC36-I 21st March 2001

¹⁰⁰ Environment, Transport and Regional Affairs Committee 6th report 'Sustainable Waste Management' HC 484-I June 1998

¹⁰¹ He added that there is a balance between plant size and efficiency (profitability) but "conceded that in the future plants taking about 50,000 tonnes per year might prove the preferred option as part of an integrated local waste strategy.

6. Air Quality and Emissions

6.1 The emissions from the proposal which are included in the Environmental Statement can be calculated from data provided by the applicant¹⁰²:

Emission	Proposed level	g/s	Annual kg Dioxin g	25 year operationa l Period tonnes Dioxin g
Particulates	10 mg/m ³	0.388	11,225	280,617
Carbon monoxide CO	50 mg/m ³	1.94	56,123	1,403,086
Volatile Organic Compounds VOC	Not provided mg/m ³			
Hydrogen Chloride HCl	10 mg/m ³	0.388	11,225	280,617
Hydrogen Fluoride HF	1 mg/m ³	0.0388	1,122	28,062
Oxides of Sulphur SO _x	50 mg/m ³	1.94	56,123	1,403,086
Oxides of nitrogen NO _x	200 mg/m ³	7.75	224,204	5,605,110
Iodine I	Not provided mg/m ³			
Mercury Hg	0.05 mg/m ³	0.000194	6	140
Cadmium Cd and Thallium	0.05 mg/m ³	0.000194	6	140
As Cr Co Cu Mn Ni Pb Sn Sb V*	0.5 mg/m ³	0.00194	56	1,403
Ammonia NH ₃	Not provided mg/m ³	0.308	8,910	222,758
Dioxins and Furans	0.1 ng/m ³	3.88E-09	0.11	2.81

*Arsenic As, Chromium Cr, Cobalt Co, Copper Cu, Manganese Mn, Nickel Ni, Lead Pb, Tin Sn, Antimony Sb, Vanadium V

¹⁰² Emissions in g/s are provided in Appendix A - Air Quality, Table 6.2 Note that when this data is transposed to table 8.1 there is an error in the particulate emissions - it should be 0.388 g/s (as for HCl and NOT 0.0388 g/s The HF data transposition is also incorrect.

It is not clear why all these emission rates are claimed to be 25% lower than the same consultants data for the similar 225,000 tpa Ridham Dock proposal which would have operated to the same emission standards.

6.2 These calculations assume that the incinerator is operating at the stated emission level throughout the operating period. No allowance is made for periods of exceedances allowed by the Waste Incineration Directive nor for the statistical smoothing of high emission values allowed by the Environment Agency. Furthermore the derived annual emissions in this table may underestimate actual emissions. This is because:

- For pollutants which are only occasionally sampled the actual emissions may be significantly greater even though the sampled levels are apparently in compliance with any authorisation. Dioxin emissions, for example, have been found to be 30-50 times greater when continuously monitored using the AMESA method (described below) rather than spot sampled. This evidence for this is examined in more detail below.
- The statistical basis for assessing emissions of pollutants which are continuously monitored allows large exceedances of authorised levels to be discarded. This potentially reduces both the half hourly readings and, because they are calculated from the adjusted half hourly average readings, the daily averages. Typical authorisation conditions are that “The half hourly average values shall be determined within the effective operating time(excluding start up and shut down if no waste is being incinerated) from the measured values after having subtracted the value of the confidence interval specified. The daily average values shall be determined from those validated average values. With regard to the calibration of continuous emission monitors, at the daily emission limit value, the values of the 95% confidence intervals of a single measured result shall not exceed the following percentage of the emission limit values or any other parameters or limit values issued, in writing, from time to time by the Environment Agency.

Carbon monoxide	10%
Sulphur Dioxide	20%
Nitrogen Dioxide	20%
Total dust	30%
Total organic carbon	30%
Hydrogen chloride	40%

- Authorisations allow data to be discarded for 10% of the time each day and for 10 days each year “*To obtain a valid daily average value no more than five half hourly average values in any day shall be discarded due to malfunction or maintenance of the continuous measurement system. No more*

than ten daily average values per year shall be discarded due to malfunction or maintenance of the continuous measurement system"

- Environment Agency authorisations also allow incinerators to continue operating whilst bypassing the bag filters and filtration system in the event of 'an emergency'.
- The Agency also allows the measurement error on monitoring to favour the operator. At the Nottingham Incinerator, for example, when total NO_x emissions appeared to exceed the limits the operator wrote¹⁰³ *"NO_x on line one is within the accuracy limits of the method used and we do not therefore intend to report this as an exceedance"*. If this practice is continued within the company then it could be anticipated that exceedances of up to 30% could be dismissed as acceptable instrument/laboratory errors. Similarly when SITA/ LondonWaste suspected that their continuous NO_x monitor at Edmonton was not reporting accurately they simply wrote to the Environment Agency to announce that they would no longer be reporting breaches of the authorisation.

- 6.3 The potential health implications of some of the main polluting emissions to the atmosphere of the kind produced by the incinerator are well documented and are described below. The severity of the effects and their frequency of occurrence within the local population will be related to the level of the emissions, the sensitivity of the receptor body and the current exposure level.
- 6.4 Emission standards are not strictly based on the health implications of the likely resultant levels of exposure. Indeed, the pollutants which are of particular concern are those for which no "safe" exposure limit has been demonstrated, i.e. a limit below which adverse health effects will not occur. These include pollutants such as dioxins and particulates. It may also be the case that this is true also for endocrine disrupting substances in the emissions. Professor Vom Saal¹⁰⁴ of the University of Missouri, for example, has said *"There are no safe doses of endocrine disrupters just as there are no safe doses of carcinogens"*
- 6.5 This is consistent with the evidence given by the Minister, Michael Meacher, to the House of Lords¹⁰⁵ that:

¹⁰³ Fax from Pat Fountain of Global Environmental to R .McLellan Environment Agency 12/2/99

¹⁰⁴ ENDS Industry and Scientists in cross fire on endocrine disrupting chemicals ENDS 268 pp 26-29

¹⁰⁵ 'Waste Incineration' with evidence, House of Lords Select Committee on the European Communities, 11th report HL Paper 71, 15th June 1999

Q440..... I repeat that the emissions from incinerator processes are extremely toxic. Some of the emissions are carcinogenic. We know scientifically that there is no safe threshold below which one can allow such emissions.

Air Quality Modelling:

- 6.6 The consultants for the applicant have used the ADMS 3 model to predict the dispersion of stack emissions. They have not, however, provided the details that are required to ensure transparency or an effective audit trail on the model as required by the joint Meteorological Society/ DOE guidelines¹⁰⁶.
- 6.7 Furthermore the input data used for the model is likely to undermine the reliance that can be placed on the results. In particular in spite of the special and longstanding concerns about effects of the location of Sheffield in a bowl of the pennines on local air pollution events the meteorological data is sourced from Leeds (c 50 km north and RAF Finningley (35 km NW). It can be seen from the wind roses in figs 5.1 - 5.4 that the difference between these two data sets is significant in terms of wind strength and direction. The data for the actual site is likely to be different again.
- 6.8 Although Appendix A to the Environmental Statement indicates that the Environment Agency prefers 'new generation' models¹⁰⁷ the application is silent on the controversy that has arisen over the accuracy and reliability of these models.
- 6.9 The Environment Agency has recently commissioned an independent review of these models and Air Quality Management reports that¹⁰⁸:
"The results were widely critical of ADMS"
- 6.10 Only about 50% of the results obtained were accurate within a factor of 2x the correct ground level concentration - there is no indication in the Environmental Statement that this range of errors has been given any consideration in the sensitivity of the results.
- 6.11 Another example of the range of outputs that can be obtained from ADMS and AERMOD modelling of the emissions comes from the Corus steel plant at Port Talbot.

¹⁰⁶ Atmospheric dispersion modelling: guidelines on the choice and use of models and the communication and reporting of results" Royal Meteorological Society, published in collaboration with the DoE, 1995.

¹⁰⁷ Page 34 para 5.2.1

¹⁰⁸ Agency Judges Dispersion Models', Air Quality Management January 2001, page 10-11

- 6.12 The Environment agency modelling of particulate emissions from a single source gives 8 times as much as Corus modelling (40.6ug/m³) and 5 times the peak value (8.4ug/m³, all 90%ile of 24-hr means).
- 6.13 Clearly the input parameters to the model can have a very significant effect on the results obtained and this is one reason that compliance with the joint Meteorological Society/ DOE guidelines is so important.

Emissions of Particular Concern

- 6.14 The emissions of special concern from this application include:
- Oxides of Nitrogen
 - Particulates
 - Dioxin
 - Others

Oxides of Nitrogen

- 6.15 The incinerator would be a major new source of oxides of nitrogen – possibly the largest single emitter in Sheffield. If operated in compliance with the emission standards claimed in the application then over XX tonnes/year of NO_x would be emitted. It is useful to put this into perspective:
- 6.16 Every second, when burning at capacity, Appendix A indicates that the incinerator would produce about 38.77 m³ of flue gas corrected to ambient temperature¹⁰⁹. Oddly a similar proposal¹¹⁰ for another 225,000 tpa plant by the same consultants for a competitor company (SITA) in Kent indicated that the corrected volume flow rate would be 51 m³/s.

¹⁰⁹ Table 6.2 corrected to 273 K, 101.3 kPa, dry, 11% O₂

¹¹⁰ Table 6.2 Ridham Dock Integrated Waste Management Facility – Environmental Statement Volume 2 May 1999. Because the stack for that proposal would be new rather than the existing stack at Sheffield the equivalent stack diameter was 2.5 m rather than the 1.92 m equivalent diameter for Sheffield. That meant that the efflux velocity could be maintained at a more reasonable 15 m/s rather than the high 19.85 m/s claimed for this application. However this does not explain how (or why) the gas flow rates and hence the pollutant flow rates have been reduced on this proposal compared to that in Kent by a factor of nearly 25%.

- 6.17 The claimed emissions in Sheffield still equate to about 3.35 million m³/day. If the plant operates to an emission standards proposed by the applicant then this would contain 200 mg/m³ of oxides of nitrogen as NO₂.
- 6.18 Assuming - for simplicity - that there was no dispersion then this is enough pollution to contaminate, every day, an area of Sheffield 18,300 m x 18,300 m and 50m deep up to the National Air Quality standard for annual average nitrogen dioxide concentrations- making no allowance for any other sources.

Air Quality Standards for Oxides of Nitrogen:

- 6.19 The relevant Environmental Quality Standards for Nitrogen Dioxide are:
- The World Health Organisation (WHO) guideline values of 200 µg/m³ as a one hour mean and 40 µg/m³ as an annual average.
 - The Air Quality Strategy¹¹¹ adopts as 'an objective for protecting human health' the less stringent target for a one hour mean of 200 µg/m³ which is not to be exceeded more than 18 times/year and is to be achieved by 31st December 2005. The Strategy also adopts a further objective of 21 ppb (40 micrograms/m³) annual mean to be achieved by 31st December 2005.
 - The WHO annual guideline level of NO_x (NO₂ + NO) for the protection of vegetation is 30µg/m³.
- 6.20 Air quality standards for nitrogen dioxide (NO₂) are set to protect health. the 'Air Quality Strategy' says:
- "Objectives for nitrogen dioxide reflect evidence that it may have both acute (short-term) and chronic (long-term) effects on health, particularly in people with asthma."
- 6.21 The Environment Act 1995 provides for the creation of a system of local air quality management which obliges local authorities to undertake an assessment of air quality in their area (and this process has reached the 3rd Stage in Sheffield) and to take actions where statutory objectives are not being met. Where any of the statutory objectives have not been met during the specified period the authority must designate the area as an Air Quality Management Area (AQMA) and prepare an action plan indicating how the objectives are intended to be met. It has been recognised in Sheffield that two AQMAs will have to be designated - one of which is very close to the proposed incinerator. There are a range of powers available to local

¹¹¹ DETR The Air Quality Strategy for England, Scotland Wales and Northern Ireland, Cm4548 January 2000

authorities to achieve the targets including the control of land uses by way of planning control.

- 6.22 The main concerns in Sheffield relate to the annual average standards and it is important to consider the ambient levels of air quality in Sheffield before looking at the additional burden that would be added by the proposed incinerator.

Ambient levels of Nitrogen Dioxide:

- 6.23 The site of the proposed incinerator is located in an area of poor air quality. The Environmental Statement says¹¹²:

“The estimated annual mean concentrations of NO₂ during 1996 in the study area were between 38-48 µg/m³. This exceeds the annual mean objective concentrations for NO₂ of 40 µg/m³.”

- 6.24 The Environmental Statement also acknowledges, for example¹¹³ :

“The boundary of the proposed City Centre AQMA (Air Quality Management Area) passes along the western site boundary of the existing EfW facility. Therefore it is likely that emissions from the new facility will have an impact on air quality within the AQMA”

- 6.25 There is absolutely no doubt that if the scheme was to be approved then the emission WOULD have an impact on air quality within the AQMA.
- 6.26 There is a limited amount of monitoring data that could help to determine the extent of the proposed AQMA of the actual influence of the proposal or the support boilers on the AQMA provided in support of the application.

The Contribution from the Incinerator

- 6.27 Table 7 of Appendix A - Air Quality indicates that the maximum annual average ground level contribution from the incinerator would be 1.65 µg/m³. This represents c 4% of the NAQS standard for annual average concentrations. For residents of Castle Court flats at 65m then the predicted concentrations would be 1.91 µg/m³.
- 6.28 The formal definition of significance can be taken from the Environment Agency Technical Guidance note (Environmental) E1. Any contribution from a fixed plant is significant if it contributes > 0.2% of the Environmental

¹¹² Para 5.59

¹¹³ Appendix A, Air Quality, Page 9

Assessment Level (EAL) . In the case of nitrogen dioxide that represents 0.08 $\mu\text{g}/\text{m}^3$ (the EAL is 40 $\mu\text{g}/\text{m}^3$). Therefore the levels of pollution added by the incinerator would reach the test of significance within the proposed AQMA and at the homes of many local residents.

- 6.29 It is unlikely that any other single source would add such a high proportion of the air quality standard to the ground level concentration in Sheffield.
- 6.30 It is clear from the application¹¹⁴, however, that there is another CHP proposal at Effingham Road, adjacent to the incinerator site, which would add a further 0.28 $\mu\text{g}/\text{m}^3$ to the annual average ground level concentration. This is apparently calculated on the basis of a $\text{NO}_x : \text{NO}_2$ ratio of 32.6%. If calculated using the standard convention of all emissions as NO_2 (which is more realistic for ground level concentrations in urban areas with relatively high ozone levels) then that would represent about 0.86 $\mu\text{g}/\text{m}^3$ another pollution burden which exceeds the Environment Agency test of significance. But which is not included in the total levels for the assessment of the Air Quality Management Area.

Health Impacts of NO_2 emissions:

- 6.31 The original version of the 'Regulatory and Environmental Impact Assessment of the Proposed Waste Incineration Directive' (REIA) gave a particularly worrying indication of the possible health impacts of incineration. These were mainly related to emissions of oxides of nitrogen.
- 6.32 A correction was issued by ENTEC who were consultants for the DETR on the REIA after the Greenpeace occupation of Edmonton and significant press coverage on the impacts. The mistake the consultants had made in the original was confirmed in a parliamentary answer by Mr Meacher¹¹⁵ to a question on 14/11/00. This correction reduced by a factor of 100 the impacts of NO_x emissions.
- 6.33 The report looked only at the avoided deaths or hospital admissions avoided by the proposed improvement in standards of emissions to those in the proposed Directive. It can be seen that the largest predicted impact arose from NO_x emissions acting as a pre-cursor to secondary ozone production. An important consequence of this is that local ambient air quality was not an important determinand of the impact of an incinerator.

¹¹⁴ para 7.9 of Appendix A

¹¹⁵ Hansard 14 Nov 2000 : Column: 579W

- 6.34 The REIA did not examine how many deaths would still be brought forward by the operation of incinerators at the proposed Directive standard or by new incinerators that may come on line. However calculating these data is a fairly straightforward exercise based on the information provided in the REIA.
- 6.35 The correction that has recently been made for the impact of NOx reduces the numbers of hospitalisations and deaths brought forward significantly. However there are still serious impacts using the revised data.
- 6.36 Whilst such calculations can only be indicative they have been ignored completely by the applicant. Over the 25 year contract period the level of impact would be:

Pollutant	Reported emissions Tonnes	No of deaths brought forward per tonne of emissions	No of respiratory hospital admissions brought forward/t	Number of deaths brought forward	Number of respiratory hospital admissions new or brought forward
Ozone (from NOx)	5605	0.0002 /t	0.0004 /t	1.12	2.24
SO ₂	1403	0.005 / t	0.006 / t	7.02	8.42
Particulate	281	0.002 /t	0.003 / t	0.56	0.84
Total				8.70	11.50

- 6.37 On the basis of projected emissions 8.7 deaths would be expected to be brought forward and 11.5 hospitalisations caused or brought forward from these acute impacts alone.
- 6.38 An uncertainty band was attached to the data and the confidence levels were detailed at pages 6 and 7 of the REIA Report which concludes that:

Therefore there is greater uncertainty attached to the estimates of health and environmental benefits compared with the cost estimates. With so many contributing factors it is difficult to predict the level of uncertainty. A very conservative estimate would be +/- one order of magnitude though we would expect the range to be narrower.

- 6.39 Consequently the range of number of deaths calculated to be brought forward could range from 0.87 to 87 and the number of respiratory hospital admissions caused or brought forward could have been 0.115 to 115.
- 6.40 The REIA further emphasises that:
"It is stressed that the benefit estimates in this report are those that can be quantified with a reasonable degree of certainty. These will be underestimates of the total benefits as several other benefits (see section 4.2) have not been quantified."
- 6.41 These unquantified impacts explicitly exclude the impacts of chronic health effects due to dioxins and certain heavy metals, as well as excluding other morbidity effects apart from the limited respiratory effects; on the environmental front they exclude reductions in ecosystem damage due to acidification, in the risk of surface water groundwater and soil contamination, and in environmental risks generally. The full disbenefits will therefore have been underestimated by simply using the data in the REIA.
- 6.42 One example of the underestimation of the impacts is that only severe outcomes are measured (death or hospitalisation). In practice the disamenity of air pollution extends much further than this¹¹⁶.
"For every hospital admission for lower respiratory disease there are about 60 people who consult their general practitioner but are not admitted. Many more episodes of asthma and other lower respiratory problems such as bronchitis do not lead to a consultation at all. Admissions therefore represent the tip of a pyramid of severity."
- 6.43 In spite of public reassurances about the 'safety' of incineration, therefore, it seems that the DETR/ENTECC advice prepared on the issue, even after correction, still indicates a very significant health dis-benefit associated with the operation of the proposed incinerator.

Particulates

- 6.44 The proposed incinerator could produce around 11,225 kg of extremely fine particulates each year. There are an increasing number of studies showing that the very finest particles i.e. those less than 2.5 or even less than 1.0 millionth of a metre in diameter are important in health terms are very damaging to health.

¹¹⁶ N Künzli, IB Tager, U Ackerman Liebrich. Issues of methodology: the epidemiological assessment of long-term effects of recurrent oxidant exposure. In Health Effects of ozone and nitrogen oxides in an integrated assessment of air pollution. UNECE/WHO Proceedings of an international workshop June 1996 p89

6.45 Dr Robert Maynard¹¹⁷ of the Department of Health, summarises the developing science of the health impacts of ultra fine particulates:

A trickle of new epidemiological studies that began in the late 1980s and turned into a flood in the 1990s, provided evidence that day-to-day variations in the already low concentrations of particles and other pollutants were still associated with effects on health. A number of reviews of this literature have been published (Department of Health, 1995; Lambert et al., 1998; Wilson and Spengler, 1996). These effects included increases in daily numbers of deaths and hospital admissions and less severe effects such as visits to general practitioners, symptoms and the consumption of anti-asthma remedies. To say that these studies have provoked controversy would be to seriously understate the case. Vigorous and sometimes acrimonious debate followed both in the correspondence columns of learned journals and in a less restrained form on the floors of international symposia. Critics argued that the results were artefactual and contrary to both common sense and established doctrine. Why were the arguments so ill-tempered? Three reasons can be suggested:

- *the results of the new studies were so significantly different from those of the older studies that it seemed to some that if the new results were right then the old results had to be wrong. The results of the older studies had been reflected upon for years and were generally considered to be sound, though doubts had been expressed;*
- *toxicologists wondered how such small doses of pollutants as implied by the results of the new studies, could produce any effects, let alone death, and felt that the epidemiological studies must be flawed;*
- *those who represented, or who were associated with, industries and manufacturers that produced pollutants or devices such as motor vehicles that emit pollutants, saw that demands for cleaner operations and products would follow and realized that these would be both difficult to meet and inevitably expensive.*

6.46 There remains controversy about the impacts although the evidence is increasing for linkage with mortality with, for example, the recent reanalysis of the Harvard Six Cities Study¹¹⁸. The USEPA report¹¹⁹

¹¹⁷ Maynard R in the Introduction to Particulate Matter: Properties and effects upon health, , Bios 1999

¹¹⁸ Reanalysis of the Harvard Six Cities Study and the American Cancer Society Study of Particulate Air Pollution and Mortality. A Special Report of the Health Effects Institute's Particle Epidemiology Reanalysis Project. July 2000.

¹¹⁹ USEPA. Air Quality Criteria for Particulate Matter, Chapter 1, Executive Summary, EPA 600/P-95/001aF, April 1996

“[t]he PM studies do show effects related to exposure to the fine 2.5 fraction, but high correlations among PM2.5, PM10 , and acid aerosols make it very difficult to attribute the effects to a single specific exposure indicator.”

adding

“Additional consideration of the subdivision of PM into fine and coarse components is also warranted. Indices of PM₁₀ exposure that have been most consistently associated with health endpoints are by PM₁₀ or PM₁₅ and fine particle indicators. Less consistent relationships have been observed for TSP and the coarse fractions of PM ._{10-2.5}”

The bag filter technology proposed for this incinerator is not efficient at filtering very fine particles. For particles of less than 1 µm down to about 0.2 µm the abatement efficiency will be very low. Furthermore current standards do not take into consideration the sizes of the particles emitted by an incinerator and there is no evidence provided in the application to demonstrate the particulate size breakdown or speciation¹²⁰.

- 6.47 Not only will the a high proportion of the ultra fine particles escape but they will be chemically reactive and carry a wide range of products of incomplete combustion and adsorbed metals with them. The subsequent direct uptake of these respirable particles and the ready transfer from the lungs into the blood stream may be part of the reason that traditional toxicology is at a loss to explain the level of impacts for such apparently low exposures.
- 6.48 Particulate emissions from incinerators are characterised by the USEPA¹²¹ in the table below.

¹²⁰ Levels of different metals and products of complete combustion that are adsorbed onto the tiny emitted particles.

¹²¹ Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds Part I: Estimating Exposure to Dioxin-Like Compounds Volume 4: Site-Specific Assessment Procedures p 3-73 Draft Final EPA/600/P-00/001Ad March 2000

Particle Diameter (μm) ^a	Particle Radius (μm)	Surface Area/Volume	Fraction of Total Weight	Proportion Available Surface Area	Fraction of Total Surface Area
>15.0	7.50	0.400	0.128	0.0512	0.0149
12.5	6.25	0.480	0.105	0.0504	0.0146
8.1	4.05	0.741	0.104	0.0771	0.0224
5.5	2.75	1.091	0.073	0.0796	0.0231
3.6	1.80	1.667	0.103	0.1717	0.0499
2.0	1.00	3.000	0.105	0.3150	0.0915
1.1	0.55	5.455	0.082	0.4473	0.1290
0.7	0.40	7.500	0.076	0.5700	0.1656
<0.7	0.40	7.500	0.224	1.6800	0.4880

Total surface area: 3.4423 μm^2

Notes: a. Geometric mean diameter in a distribution. Distribution from EPA (1980).

It can be seen that the smallest particles have the largest fraction of the surface area. Particle size is clearly a critical factor in the evaluation of the exposure/dose/risk relationship. The decay products associated with aerosols in the smallest size range (the ultra-fine) have much higher mobilities in the air and can more effectively deposit in the respiratory system.

- 6.49 The only data that has been allowed into the public domain by the incineration industry in the UK on particulate size is one set of data collected on 19th August 2000 from SELCHP. I understand that the cover page and spreadsheet is all the data that was provided by the contractor (AEA). Such brevity is unusual as other sampling reports for other determinands that I have seen by the same contractor provide considerable detail about the sampling protocol used.
- 6.50 The data does not, as has been claimed, demonstrate filter efficiency as there is no upstream comparator to assess the reduction across the filter. It is superficially reassuring that there are zero particulates reported below 0.36 micrometres. However with the very limited information available there remain significant outstanding concerns.

- 6.51 It seems that the stack emission level at the time of monitoring was less than 0.5 mg/m³ which is significantly lower than usual - monitoring by CRE on 10th and 11th of November 1999 by comparison found levels of 16 and 18 mg/m³. The uncertainty for the cascade method was low at ± 48% and it is not clear why a condensation particulate sampling system was not used - nor why comparative tests upstream of the filter bags were not included.
- 6.52 Ultrafine particles, because of their tiny volume, contribute very little to the mass of the total particulates. In this monitoring exercise the rounding error alone on the weighing gives ± 0.0001 g which, alone, means that the < 0.36 µm could easily be 1/21 or about 5% of the total mass.
- 6.53 This rounding error could therefore mean that rather than a zero count by far the majority, by number, of the particulate emissions could be smaller than 0.36 µm. It would not be wise, therefore, to rely upon the 'zero' result from this exercise as a demonstration that ultra fine particulates would not be emitted from the proposed bag filters.
- 6.54 It is notable that no other data using appropriately sensitive sampling equipment to support this analysis has been provided for any plant.
- 6.55 Exposure to particulate pollution has been associated with the exacerbation of chronic lung and heart diseases, such as asthma (especially in children), emphysema and ischaemic heart disease. It has also been linked with increased incidence or severity of lung infections such as bronchitis or pneumonia, even where no chronic disease is underlying. Exposure increases relatively minor respiratory symptoms - coughs, colds, sinusitis¹²². Some researchers have found particulates to be associated with increased risk of lung cancer¹²³. And they have been associated with the promotion of some allergic disorders - asthma, eczema and hay fever¹²⁴.
- 6.56 Concerns were also raised by the House of Lords European Committee in their report on the proposed Waste Incineration Directive at para 110 (page 27) where they raise concerns about aerosols of particulate ammonium nitrate from SNCR processes in new incinerators:

"In particular in the light of evidence from health professionals about emissions of particles of ammonium nitrate below PM 2.5, and their behaviour in the body, we would welcome the further research that is being conducted in this area."

¹²² Dockery, DW and Pope, C, Acute Respiratory Effects of particulate Air Pollution, Annual Review of Public Health, Vol. 15 (1994, pp 107-321).

¹²³ Pope, C, Lung cancer and Air Pollution, Environmental Health Perspectives, 1995

¹²⁴ Department of the Environment Expert Panel on Air Quality Standards 1995. Particles.

- 6.57 These concerns are supported by recent research including a review of daily mortality and air pollution in Santa Clara County, California by Fairley¹²⁵.
- 6.58 He found that there has been a profusion of epidemiologic research showing associations between particulates and health effects—mortality and that this research supported the promulgation of a national standard for particulate matter [less than/equal to] 2.5 micron in aerodynamic diameter (PM_{2.5}) by the U.S. Environmental Protection Agency. His study found that daily mortality and air pollution persisted even when the Bay Area met national air pollution standards for every criteria pollutant. Of the various pollutants, the strongest associations occur with particulates, especially ammonium nitrate and PM_{2.5}. He concluded that the continuing presence of associations between mortality and air pollutants called into question the adequacy of national standards for protecting public health.
- 6.59 Whilst chronic health impacts and ultra fine particulates have not been quantified in the DETR REIA these issues were addressed in some detail in the report for the European Commission on the Economic Evaluation of the (then) Draft Incineration Directive:
- Quantified total damages excluding chronic effects of particulates on mortality are in the range of 10 – 60 ECU per tonne of waste incinerated. Results are dependent on the plant option, site, stack height, and other details. Incorporation of chronic effects of primary and secondary particulates on mortality would raise this to a range of 30 to 180 ECU per tonne of waste incinerated. We prefer to report results with and without chronic effects on mortality because of the sensitivity of the outcome of the results to small changes in the assumptions regarding this single impact, analysis of which is prone to large uncertainty.*
- 6.60 The attempts to reduce NO_x (the main cause of impacts identified by the DETR REIA – as above) by the use of SNCR, as proposed, increases the risk of the secondary particles being formed – quite possibly, according to the DGXI report, increasing the total impacts of the waste incineration process.
- 6.61 A recently published paper in by Laden¹²⁶ et al. indicates that combustion particles in the fine fraction from mobile and coal combustion sources, but not

¹²⁵ Daily mortality and air pollution in Santa Clara County, California: 1989-1996 Fairley D. Bay Area Air Quality Management District, San Francisco, California 94109, USA. Environ Health Perspect 1999 Aug;107(8):637-41.

¹²⁶ Francine Laden, Lucas M Neas, Douglas W Dockery and Joel Schwartz Association of Fine Particulate Matter from Different Sources with Daily Mortality in Six U.S. Cities Environmental Health Perspectives Volume 108, Number 10, October 2000

fine crustal particles, are associated with increased mortality. This increases concerns about the source of ultra fine particulates. In the absence of data to show that the proposal would not be a major source of the most damaging particles then the proposal should not be given the benefit of any doubt.

- 6.62 Another fairly recently published report by the Institute of Occupational Medicine¹²⁷ for the Department of Health shows that the chronic impacts of particulates on a population scale result in a two week lower life expectancy per $\mu\text{g}/\text{m}^3$ of particulate pollution. ENDS¹²⁸ reported on this study in January 2001: *“Importantly, the study found that the effects varied in direct proportion to the reduction in PM10 levels - a $1\mu\text{g}/\text{m}^3$ reduction will therefore reduce mortality by 0.38%. The implications of this finding for planning and policy are manifold.”* The environmental statement should therefore include calculations of the total population affected by increased particulate levels and estimate the impact in overall population life expectancy:

$$\text{Population affected} \times \text{Average increase in PM}_{10} \times 14 = \text{total life days lost}$$

- 6.63 Whilst it is not possible for me to complete this calculation with the data available in the application it is very likely that the total impacts would be significant and in conflict with the Human Rights Act¹²⁹.

Further Information

- 6.64 Further information will be provided as described in the introduction when the IPPC application becomes available.

¹²⁷ *Towards assessing and costing the health impacts of ambient particulate air pollution in the UK*

¹²⁸ ENDS January 2001, Issue No. 312 “UK study confirms that air pollution kills thousands each year

¹²⁹ A similar calculation for a 165,000 tpa incinerator proposed for Portsmouth indicated that a total of more than 50 years of life would be lost by the local residents.

APPENDIX 1

SHEFFIELD UDP WASTE POLICIES

Policy MW3: Waste Management

When catering for waste materials, all recycling and disposal options will be examined so that:

- (a) The amount of tipping space would be kept to a minimum; and
- (b) Sufficient waste, recycling and disposal sites and facilities would be available; and
- (c) The best techniques and highest possible standards could be achieved at all times.

Policy MW4: Waste Disposal Facilities

The development of land for waste disposal facilities will be permitted when:

- (a) There is no alternative facility available; and
- (b) There is insufficient capacity elsewhere in Sheffield or within an acceptable distance of the City; and
- (c) In the case of tipping operations, the type of waste and methods to be used would be appropriate to the site; and
- (d) It would comply with Policy MW7.

Policy MW5: Waste Disposal Areas

In the Beighton Road and Parkwood Springs Waste Disposal Areas, waste disposal is the preferred use in the short-term. Any development, which would prevent this use, will be unacceptable until after waste disposal operations have ceased.

Long-term uses should comply with Green Belt or Open Space Area Policies as appropriate.

Other sites may be used for waste disposal where they comply with Policy MW7.

Policy MW6: Recycling and Reclamation

Development involving recycling and reclamation of suitable waste materials will be promoted except where this would be incompatible with surrounding land uses. This will be done by:

- (a) encouraging and developing domestic, industrial and commercial recycling and reclamation in suitable locations; and
- (b) developing recycling centres throughout Sheffield and giving priority to;
 - (i) the Damall area; and
 - (ii) the west and south west of the City.

Policy MW7: Environmental Impact of Mineral Working and Waste Disposal Operations

Mineral working and waste disposal facilities will be permitted only where disturbance to the environment would be kept to an acceptable level and where they would:

- (a) comply with Policies for the Built and Green Environment as appropriate; and
- (b) not disturb or cause a nuisance for other land uses, particularly sensitive neighbours; and
- (c) not cause unacceptable disturbance to the local environment as a result of more than one site being worked at the same time; and
- (d) not involve unacceptable duration, phasing, methods or standards of working, or excessive active areas or hours of working; and
- (e) provide for screening of the site; and
- (f) provide restoration and aftercare of the site for uses appropriate to the area; and
- (g) provide for the use or control of landfill gas; and
- (h) not give rise to levels of traffic that would make roads unsafe or harm the character of the area, both near the development and along the routes used; and
- (i) use canal, rail, pipeline or conveyor facilities, wherever possible.