

**The human health impact of the proposed landfill at the Nevitt, Fingal: a critique of the health assessment in the EIS submitted with the planning application.**

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## **My Background**

I qualified in medicine in 1984, and after working in paediatrics for five years, I moved to train in academic epidemiology. I have a medical degree, a doctorate in epidemiology, and I am a member of the RCPI, and a fellow of the Faculty of Public Health. I am a member of the International Society for Environmental Epidemiology (ISEE), the premier professional organisation in this field.

I have worked on issues in environmental epidemiology since 1990, and particularly since I moved to work in the Small Area Health Statistics Unit at Imperial College. Since returning to work in Ireland in 1997, I have developed the first environmental epidemiology unit in the country.

I have worked on many environmental health projects in Ireland including the health assessment at Askeaton, the HRB funded report on the health and environmental impact of waste disposal, the human health impact of the uranium contamination at Baltinglass, a baseline health assessment of the proposed incinerator at Ringsend, an EPA funded project on the environmental burden of disease in Ireland, a report on the assessment of the human health impact of illegal landfill sites, a report on the EIS for the proposed incinerator at Carranstown, a report on the EIS for the proposed hazardous waste incinerator at Ringaskiddy, and a report on the human health assessment in the EIS for the second runway at Dublin airport.

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# Health Impact Assessment

I believe that it is both appropriate, necessary, and arguably, required by EU legislation, to properly assess the potential health impact of the operation of large industrial facilities. By analogy with 'Environmental Impact Statement' the standard term for the suite of methods used to do this is 'Health Impact Assessment' (HIA).

- What is HIA?

A combination of methods and tools by which a policy, programme or project may be judged as to its potential effect(s) on the health of a population and the distribution of those effects within the population.

- Why use it?

To ensure that the health consequences of decisions – positive or negative – are not overlooked

To identify new opportunities to protect and to improve health across the range of policy areas.

To understand better the interactions between health and other policy areas.

- When it can be used?

In advance of a proposal being implemented (prospective assessment).

After a programme has finished or after an unplanned event has happened (retrospective assessment).

At the same time as a proposal is being implemented (concurrent assessment).

- What does it comprise?

- 1) Screening

Involves considering the relevance to people's health of a specific policy, programme or project and how it might affect it.

- 2) Scoping

To determine the focus and extent of the assessment

- 3) Assessment

Rapid appraisal or a more detailed study.

## **HIA's in practice**

What does a 'Health Impact Assessment' or HIA look like? Much depends on the scale of the development, as this largely determines the scale of the HIA required. HIA's for a housing estate, a motorway, and an airport runway, for example, would look very different.

In general terms a HIA will have three main sections. The screening report, which justifies carrying out a HIA, will describe in general terms, the possible impacts of a proposed development on human health, and conclude either that a HIA is warranted, or not. This could take one or two weeks, and is a desk exercise.

The next section, the scoping report, applies the general issues in the screening report to the specific situation, of this specific development in the specific site. This section will develop the scale and scope of the assessment, together with stakeholders, such as planners, developers, and members of the local community. This part of the process can take anything from a few days to a few weeks, and determines the scale of the assessment phase.

The final section, the assessment report, is the most variable element of the HIA. The big division is between projects whose assessment can be done as a desk exercise, usually building on other components of the EIS, and projects which require field work with the affected communities. The former are quick, quite cheap, and suitable for many smaller developments. The latter are more complex, and take longer, typically between a few months and a year. However, for large developments with potentially complex effects, such fieldwork is required.

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## **Content of the EIS**

Chapter 3 of Volume 1 of the EIS submitted for the planning application is entitled 'Environmental impacts'. The first section of this is labelled 'Human Beings' and the first subsection of this is 'Public Health', and the second 'Community Impact'. The second subsection is described as a summary of a longer report, presented in Volume 3, Appendix A, 'Human Beings, Social and Community'.

### ***Critique of 'Public Health'***

#### **Summary**

This section of the EIS seems to me to be deficient. I would not regard this as an adequate or a useful contribution to an assessment of the human health impacts of the development proposed here. There is no description of the process used to produce it, but I do not see any obvious indication that any formal process for human health assessment was used.

Even the brief consideration that I have been able to give to possible health effects, in itself no substitute for a formal scoping exercise, suggests at least the following areas which could be considered :-

***Particulate emissions; Noise; Dust; Odour; Vermin; Waste transfer; Waste spills; Flooding; Ground water contamination; Drinking water contamination; Transport hazards; Transport emissions***

These are complex exposures, with many routes of exposure, many different possible effects on different segments of the population, and many different sources in plant construction, operation within parameters, and operation outside parameters.

#### **Details**

I shall review Section 3.1 'Human Beings - Public Health' in detail.

##### ***3.1.1 Introduction***

I have been unable to find the document from the IPHI referred to – There is a document published in 2006, 'Health Impact Assessment Guidance' which may be what is meant. In any event there is no further reference to any kind of HIA process in the remainder of Section 3.1. There is no description of any HI process, and no indication that any has been done. I reproduce 2 pages of the IPHI

document as Appendix 1.

### **3.1.2 Methodology**

The methodology described is not a recognised HIA methodology, and is entirely inappropriate. There is no evident assessment of site-specific risk, as the assessment is extremely generic, and the 'review of the medical literature' is incomplete, contains several serious errors, and is, in my view, inadequate.

### **3.1.3 Existing Environment**

#### **3.1.3.1 Context**

The proposed site is a densely populated rural community, close to two rapidly developing towns.

#### **3.1.3.2 Character**

This section describes the population living in the region, on the basis of extrapolation from the national census figures. No consideration at all is given to any site-specific issues. Similar conclusions would be drawn, using these methods, for any set of 118, 259 or 497 houses anywhere in the country.

Applying this principle more widely, for example, the site hydrogeological assessment could have been done by drilling test holes in the grounds of the Fingal council offices in Swords, and then asserting that 'there is no evidence that the soil in this area is any different from the national soil'. This would be evident nonsense for hydrogeology. It is equally wrong for human beings.

The next paragraph is garbled. Part of the sentence describing the remand centres has been elided. The choice of buffer zone is not backed up with any references.

#### **3.1.3.3 Significance**

#### **3.1.3.4 Sensitivity**

The conclusion drawn, namely 'there is no reason to expect the population to be more( or less) vulnerable' is based on a failure to look. This report does not even include an accurate count of the population in the affected area, perhaps an indication of the importance attached to people by the authors of this report.

### 3.1.3.5 Literature review

### 3.1.3.6 Introduction

The authors refer to a report written by myself and my colleagues in 2002. I have not been able to find a list of references in the EIS, but I note that of the references they cite (Table 1), all except 2 can be matched with our report.

| <i>Reference</i>  | <i>In HRB report?</i> |
|---|-----------------------|
| Dolk et al, 1998  | Yes                   |
| Elliot et al. 2001  | Yes                   |
| Geschwind et al. 1992   | Yes                   |
| Budnick et al. 1984   | Yes                   |
| Croenet et al. 1997   | Yes                   |
| Roberts et al. 2000   | Yes                   |
| Vrijheid et al. 2002  | Yes                   |
| January 2004 published in the Irish Medical Journal by Boyle et al. | No                    |
| Pukkala and Ponka 2001  | No                    |
| Janerich et al. 1981  | Yes                   |
| Polednak and Janerich 1989  | Yes                   |
| Goldberg et al. 1995  | Yes                   |
| Griffith et al. 1989  | Yes                   |
| Janerich et al. 1981  | Yes                   |
| Gelberg 1997  | Yes                   |
| Boswell and McCunney 1995   | Yes                   |
| Gelberg 1997  | Yes                   |
| Elliot et al. 2001  | Yes                   |

The authors state that 'The literature has been reviewed for different health effects', but do not specify how the review was done. The fact that they only quote one paper published after 2002, and that an Irish paper which received significant media attention, does not suggest that any very significant attempt was made to review the literature.

### **3.1.3.7 Congenital malformations**

The authors describe on three studies – the Dolk et al. 1998 study, the Boyle et al 2004 study, and the Vrijheid et al. 2002 study.

They mention four others, Geschwind et al. (1992), Budnick et al. (1984), Croenet et al. 1997 and Roberts et al. 2000. If the last of these references is in fact the matching reference from our report, then it is not a study, it is a letter responding to another study. This does not suggest that much effort was put into this section of the literature review.

There are several more recent papers which should have been reviewed.

The University of Birmingham/Enviros study referred to at the bottom of page 77, but nowhere referenced that I can see, is presumably the report commissioned by DEFRA and found at <http://www.defra.gov.uk/ENVIRONMENT/WASTE/research/health/>.

This is not additional research, rather it is a further literature review. I am disappointed by the report's acceptance of an unspecified 'minor' effect on public health, and the failure to explain what this might be.

### **3.1.3.8 Cancers**

This section has 6 paragraphs. Of these paragraphs 2,3,4 and 5 are taken verbatim, and without acknowledgement from pages 171 and 172 of our report.

There is no explanation for why these four studies were included and the other 3 we referenced were omitted. There is no reference to any of the more recent studies on this important question.

Paragraph 1 fails to note that while some of the affected houses described were indeed built on top of the Helsinki dump others were built beside it.

Paragraph 6 is a summary of paragraphs 1 to 5. Describing a risk as absolutely minimal is not sufficient – it is necessary, admittedly hard, but necessary, to produce an estimate of the size of the risk

### **3.1.3.9 Symptoms of illness**

This section has no references at all, no descriptions of any of the studies in this area, and a conclusion which I believe to be incorrect as stated. There were five studies on this issue referenced in our report.



### 3.1.3.10 Psychological health

There is a blanket statement, entirely devoid of supporting references, that 'there is no evidence of adverse effects on mental wellbeing of those living near to landfill sites'. This is not true.

One example, among many, suffices :- 'Greenberg M et al. Hazardous waste sites, stress, and neighborhood quality in USA, The Environmentalist, 14:1994;93-105'.

### 3.1.3.11 Occupational effects

This section contains 3 paragraphs. The first sentence of Paragraph 1, and all of paragraphs 2 and 3 are taken verbatim, and without acknowledgement from our report on pages 177 and 178.

### 3.1.3.12 Elliott et al (2001).

This is by far the most important study on the health impact of residence near a landfill site. The authors of the EIS quite correctly devote significant space to discussing it. I shall respond to their argument paragraph by paragraph. The material from the EIS is in italics.

*The largest study carried out on the health effects of landfill sites was that by Elliot et al. for the Dept of Health in the UK published in August 2001. This appeared to show small excess risk, in the region of 1% for overall congenital abnormalities but no increased risk of cancer to those living within 2 km radius of a landfill site. It also showed a higher rate of congenital abnormalities for those living near a hazardous waste site, although this is less relevant to the proposed Fingal landfill. This is consistent with results reported in the EUROHAZON study.*

The study did in fact show an increased risk for congenital anomalies and low birth weight in people living within 2 km of a landfill site. There was little evidence of any systematic difference between hazardous and non-hazardous sites, and little data to sharply distinguish these two categories.

*To put this into context, the background rate of congenital abnormalities is about 2% of all births. A 1% increase even if true would give a rate of 2.02% or an excess case every 5000 births. Again this effect is related to hazardous landfill sites often with old or inadequate controls. Logic dictates that for a non-hazardous landfill with modern controls the rate of*

*congenital abnormalities must be less and probably very much less.*

Logic may dictate many things, but evidence, not idle supposition would be nice. The effect was not limited to hazardous sites, as a cursory reading of the paper would show, for example Table 4 on page 366 of the paper. The rate of all congenital anomalies in Ireland is about 2.5%. (Eurocat data 200-2001), and there are roughly 60,000 births a year, giving 1,500 affected children a year. A 2% increase in Ireland would lead to approximately 30 extra affected children.

*There was no increase in the rate of cancers overall reported in the study. One of the more statistically significant findings of the study was an apparent increase in the incidence of low and very low birth weight babies. The study showed an increase in the order of 5%. However, the study did not control for cigarette smoking which is probably the single most important factor affecting birth weight in a Western society, so the relevance of this finding is unclear.*

It is indeed true that no increased incidence of cancer was reported in this study. As the study did not include, present, or analyse any data on cancer, this is also not surprising, and perhaps not worth specifically mentioning.

On a more relevant point, the study showed, as have several other studies, that there was a substantial and consistent excess risk of low birth weight around both hazardous and non-hazardous sites. The main risk factor for low birth weight, besides being of South Asian ethnicity is poverty, for which the study did make an adjustment. It is also of interest to note that the risk of low birth weight rose when the sites opened.

*Though the study is generally well designed there are a number of limitations, some of which it shares with some of the other studies outlined in this literature review. It included well designed and operated landfills as well as poorly managed landfill sites, which could skew the results, particularly given the very small level of reported excess.*

True, but not very relevant. All studies on this topic are imperfect, but waiting for a perfect study is not an option.

*While the study did attempt to allow for other factors known as confounders, it is impossible to allow for all possible confounders. Indeed they did not even*

*attempt to control for some potentially relevant factors such as smoking and occupation. Therefore, while noteworthy the findings cannot be relied upon and need to be considered in the light of the other available literature.*

The importance of this study is that it was well designed, that it is consistent with much of the previous (and subsequent) literature, and that they did attempt to control for confounding.

### **3.1.3.13 Summary of literature on health effects of landfilling**

Given the many deficiencies in this report viewed purely as a literature review, there seems little point in further critiquing the conclusions. Conclusions can not be more credible than the material from which they are drawn!

### **3.1.4 Effect impacts relating to public health**

This section is extremely short, and does not contain any recognisable attempt at impact assessment.

#### **3.1.4.1 "Do nothing" impact**

This is not credible as a serious assessment of the do-nothing state. It is far too short, confusing, and badly structured.

#### **3.1.4.2 Predicted impact**

The list of potential routes of impact is incomplete. I would suggest, at least, Particulate emissions; Noise; Dust; Odour; Vermin; Waste transfer; Waste spills; Flooding; Ground water contamination; Drinking water contamination; Transport hazards; Transport emissions. I am sure that a more detailed scoping exercise would find more and make them more site-specific.

Most of the rest of this section is a re-iteration with no references whatever, of some basic toxicological principles. This is unexceptionable, but also completely unhelpful in assessing the impact of this development.

Stating that the operators of a site will obey the law, does not amount to impact assessment.

### **3.1.5 Mitigating adverse impacts**

In the absence of any site-specific assessments of impact, site specific mitigation measures have no basis. In any event no specific measures

are suggested.

### **3.1.5.1 Construction impacts and mitigation**

There are no mitigation measures suggested.

### **3.1.6 Residual impacts**

There is no evaluation of these at all, other than a blanket denial of their existence.

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## Capacity

In our HRB funded report we noted that Ireland was poorly equipped to assess, monitor, and enforce human health protection :-

### **“(a) Risk assessment**

Ireland presently has insufficient resources to carry out adequate risk assessments for proposed waste management facilities. Although the necessary skills are available, neither the personnel nor the dedicated resources have been made available. In addition, there are serious data gaps (addressed under point (c) below). These problems should be rectified urgently.

### **(b) Detection and monitoring of human health impacts**

Irish health information systems cannot support routine monitoring of the health of people living near waste sites. There is an urgent need to develop the skills and resources required to undertake health and environmental risk assessments in Ireland. This should be considered as an important development to build capacity in Ireland to protect public health in relation to potential environmental hazards. The recommendations in the Proposal for a National Environmental Health Action Plan (Government of Ireland 1999) could form a basis for this.

### **(c) Detection and monitoring of environmental impacts**

The capacity (in terms of facilities, financial and human resources, data banks, etc.) must be developed for measuring environmental damage, and changes over time in the condition of the environment around proposed waste sites and elsewhere. There is a serious deficiency of baseline environmental information in Ireland, a situation that should be remedied. The lack of baseline data makes it very hard to interpret the results of local studies, for example around a waste management site. Existing research results should be collated and interpreted as a step toward building a baseline data bank. A strategically designed monitoring programme needs to be initiated that can correct deficiencies in current ambient environmental monitoring. In addition, capacity needs to be built in environmental analysis. In particular, Irish facilities for measuring dioxins are required, and should be developed as a priority. However, the high public profile of dioxins should not distract attention from the need for improved monitoring of other potential pollutants.

**(d) Risk communication and perception**

Qualitative studies about waste management perceptions revealed a diversity of opinion about waste management issues generally, and about the links between waste management and both human health and environmental quality. To facilitate public debate on the issues of waste management policy and effects, a systematic programme of risk communication will be necessary. This should concentrate on providing unbiased and trusted information to all participants (or stakeholders) in waste management issues. Public trust, whether it is placed in the regulators, in compliance with the regulations or in the information provided, will be fundamental in achieving even a modicum of consensus for any future developments in waste policy in Ireland." (Crowley, Staines et al. 2002).

This remains true, although some progress has been made, for example dioxin measurement facilities have been established in UCC; the National cancer registry has capacity to monitor cancer incidence in small areas; the registries of congenital anomalies, now part of the Eurocat system, have extended their coverage to more of the country; in the former Eastern Region a great deal of health data is available at small area level.

The current situation is that neither the EPA, nor the local authorities, have the capacity, to adequately monitor and police human health. Notionally this is the role of the Department of Health, however the very limited resources in the Department, are well indicated by Ireland's continuing failure to produce our (EU mandated) National Environmental Health Action Plan. The curious division between the respective roles of the planning authority and the EPA has not helped the development of such capacity in Ireland.

## Conclusions

The material presented is primarily a literature review, significant parts of which are copied directly and without acknowledgement from my previous work. The review is incomplete, out of date, and contains a number of important errors. It could not provide a basis for any legitimate decisions about planning or waste licensing matters.

While a good review of current knowledge is a good place to start, it would represent only a small fraction of a proper health impact assessment. There is no trace of any credible attempt to estimate potential impacts, and no consideration is given to possible mitigation of these impacts.

The proposed development, in my professional opinion, requires a proper HIA along the lines proposed by the IPHI, to ensure reasonable consideration of human health issues in the planning and licensing processes.

The material provided in the EIS falls far short of any reasonable estimate of what is required.

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## Appendix 1

(Source **Health Impact Assessment Guidance - Institute of Public Health in Ireland, April 2006 pp7,8**)

### 2.7 What is involved in doing a HIA?

There are a variety of approaches to undertaking HIA but most of them follow a similar step-by-step and methodical approach as laid out in this guidance. Experience shows that the different stages laid out here sometimes overlap with each other. For example, screening and scoping are sometimes carried out as one exercise. Aspects of HIA can be adapted depending on local circumstances, resources or subject matter. Each HIA is uniquely determined by local conditions, such as:

- The status and complexity of the policy, programme or project.
- Whether the HIA is to be undertaken before, during or after decisions on the policy, programme or project are made.
- The likelihood of health impacts occurring.
- The scale and severity of the impacts.
- The resources available.
- The quality of the evidence base and availability of data.
- Locally determined health priorities and targets.

Whatever the approach, it should be rigorous, systematic and transparent.

### 2.8 When to conduct a HIA

Ideally HIA should be carried out early in the policy-making process when health considerations can still influence the decisions at stake. In deciding when to undertake a HIA, it is important both to be clear about who is making key decisions, and to identify key decision points in a given proposal for a new policy, programme or project.

The following is a classification to denote the stage at which the HIA is undertaken:

- **Prospective HIA** - A prospective HIA is carried out when a policy, programme or project is in its developmental stage and findings and recommendations can influence decision-making. This is the ideal time to carry out a HIA.
- **Concurrent HIA** - A concurrent HIA takes place while the policy, programme or project is being implemented. This might be applicable when the policy, programme or project is subject to



review.

- **Retrospective HIA** - A retrospective HIA is carried out on a policy, programme or project that has already been implemented. This can be useful where something similar is being suggested for the near future and it is important to learn from the lessons of previous exercises.

## 2.9 What are the steps involved in HIA?

This section gives an overview of the stages typically involved in HIA. These steps are described in detail in Section 3.

### **Screening**

Screening quickly and systematically establishes whether a particular policy, programme or project has an impact on health and whether a HIA is appropriate or necessary.

### **Scoping**

If screening has determined that HIA is to be carried out, the next stage is then scoping. This stage produces the blueprint for the HIA, establishes a steering group and produces a work plan for the HIA.

### **Appraisal**

The appraisal stage is the main part of the HIA where health impacts are considered, evidence is gathered and recommendations are framed.

### **Statement of influence**

Once the assessment is complete a statement of influence is produced showing how the HIA has influenced both the decision-making process and outcomes.

### **Monitoring and evaluation**

This stage assesses whether the aims and objectives set at the beginning of the HIA were achieved and whether the methodology used was effective or suitable.