

Indaver's Ringaskiddy Resource Recovery Centre.

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My background and qualifications

I qualified in medicine in 1984, and after working in paediatrics for five years, I moved to train in public health and epidemiology. I have a medical degree, an MSc and a PhD in epidemiology, and I am a member of the RCPI, and a fellow of the Faculty of Public Health. I am a specialist in Public Health.

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 incinerators at Ringsend, Carranstown, Nobber, and two earlier proposals at Ringaskiddy, and a report on the human health assessment in the EIS for the second runway at Dublin airport. Most recently I have completed a health impact assessment of Special Olympics Ireland.

Scope of this report

I have been asked to respond within a very tight time frame to the revised application. I have reviewed EIS Chapter 6 and what appear to be the two most relevant appendices. I have also reviewed the response to our original submission from Dr. Martin Hogan, presented at the oral hearing, and I respond to this at the end.

Issues

Appendix 6.1 Hazid Report

I note the extensive disclaimer.

I note the site overlies a series of highly vulnerable aquifers Figure 1.6.

I note the use of Cork airport weather data Table 1.3, although Cork airport is at a much higher elevation.

Section 2.4.3 – Flooding - risk of flooding from the sea is not considered, and seems to my non-expert eyes to be much higher than the risk of flooding from land.

Section 2.5.3 – Consequence Modelling – Acute Toxic Exposure – the description of probit modelling is incomplete, and, as presented, meaningless. This is of consequence as the interpretation of these models drives the entire risk assessment.

Section 2.5.4 - Assessment of Impacts – Releases to the Aquatic Environment – there is no consideration given to the identified permeability of the site, and the inevitable risk of aquifer pollution.

Section 2.6.1 - 1 Review of Accident Scenarios – it's not clear exactly why these three scenarios were chosen.

Section 2.8.1 - Bunker Fires – It is not clear why dioxins were chosen. It seems likely that a major fire would release large amounts of particulates, with well known health effects. This hazard ought to be assessed.

Section 2.8.2 - Loss of Containment of aqueous Ammonia or Hydrochloric Acid

The AEGL distances quoted extend very substantially off the site, and include most of the National Maritime College, if I have read the maps correctly – Note that the the AEGL level is described earlier in the report (p31) as 'airborne concentration of a substance above which is it predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape'. The consequences of this are not discussed, and no indication is given of the methods to be used to evacuate the NMCI in case of a serious ammonia accident.

Appendix 3 – no data are provided which would permit an independent assessment and verification of the risk assessments given. This is disappointing.

Appendix 6.2 - Health Impact Assessment by EHA Occupational Health Hygiene Consultants (2015)

This document is described as a Health Impact Assessment. No indication is given of the authors, nor of their qualifications. If the authors are the EHA Occupational Health Hygiene Consultants who maintain a website at <http://www.eha.ie/>, they seem to be a specialist occupational medicine practice.

To quote from their site ‘**Our Consultants are registered Specialists in Occupational Medicine and are members of the Faculty of Occupational Medicine, Royal College of Physicians of Ireland.**’ Occupational medicine is the branch of medical practice concerned with maintaining the health and well-being of employees in industry. Practitioners have a specialist knowledge of workplace hazards, and strategies for the amelioration of these, and reducing their impact. This is, of course, a very valuable professional skill. However, it is the wrong professional skill for this setting.

There is no indication on their website that they have any experience, knowledge, training or skills in health impact assessment. They do describe skills in environmental risk assessment, held by a Dr. Martin Hogan. The first sentence in this description is ‘**Environmental medicine is the study of the impact of human activity on the environment**’. This is not correct.

The document also reveals some very basic misunderstandings about health impact assessment (HIA). The US CDC have a convenient definition and description of HIA (<http://www.cdc.gov/healthyplaces/hia.htm>) -

“HIA is a process that helps evaluate the potential health effects of a plan, project or policy before it is built or implemented. An HIA can provide recommendations to increase positive health outcomes and minimize adverse health outcomes. HIA brings potential public health impacts and considerations to the decision-making process for plans, projects, and policies that fall outside the traditional public health arenas, such as transportation and land use.

The US **National Research Council** defines HIA as “a systematic process that uses an array of data sources and analytic methods, and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population. HIA provides recommendations on monitoring and managing those effects.”

The major steps in conducting an HIA include

- Screening (identifying plans, projects or policies for which an HIA would be useful),
- Scoping (identifying which health effects to consider),
- Assessing risks and benefits (identifying which people may be affected and how they may be affected),

- Developing recommendations (suggesting changes to proposals to promote positive health effects or to minimize adverse health effects),
- Reporting (presenting the results to decision-makers), and
- Monitoring and evaluating (determining the effect of the HIA on the decision). “

The Irish IPH has another definition (<http://www.publichealth.ie/whatishealthimpactassessment>) -

“Health Impact Assessment (HIA) is commonly defined as ‘a combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population and the distribution of those effects within the population’.

This definition is known as the Gothenburg Consensus and was developed by a group of HIA practitioners in 1999. The [*Gothenburg Consensus Paper*](#) outlines the main concepts and suggested approach to HIA and is identified as a first step to creating a common understanding of HIA.

The procedures, methods and tools that are used in HIA include policy analysis, demography, collation and analysis of evidence of health impacts, quantitative and qualitative research, and community consultation. HIA attempts to draw these elements together to enable a systematic identification of health impacts.

The purpose of HIA is to influence decision-making in favour of health. By completing a HIA, decision-makers should have evidence-based recommendations to maximise the positive and minimise the negative health impacts of proposals. “

I would agree with both of these. There is a very extensive literature on HIA (1-6), and it is a very standard approach, commonly used as part of responsible development practice.

Review of Health Impact Assessment

I identify a number of distinct sections.

Executive summary

This might better be titled an abstract.

Introduction

Much of the introduction is a long excursion on why it is hard to do HIA. There is no adequate description of HIA in the text. They comment that ‘Currently there is no legal requirement to perform a stand-alone Health Impact Assessment and as a result there is no “competent authority” in Ireland to assess these’. It’s unclear what legal background the authors have to make this statement as experts. They seem to disapprove of the idea of a stand-alone HIA, but do not clarify

what they mean by this. In the usual terms a stand-alone HIA would be one not integrated with other parts of an impact assessment. It is hard to see why this would even be considered in the setting of an EIS.

Reading further, it seems that the key argument is on page 4 - 'this method [stand-alone HIA] might be appropriate for nationwide policy/ strategy decisions, but a standard Health Impact Assessment is neither legally required nor practical for a site specific project such as the proposed on [sic] for Ringakiddy'. Leaving to one side the legal issue, this is not true. There are many examples of site-specific HIA, and in fact most HIA is site-specific (7 -13). The term 'Policy Impact Assessment' is more usually used for the tools to assess the impacts of nationwide policy decisions.

They give one example of the what they describe as 'the problems faced with the approach', which is discussion on various sources of error in cancer registration. This does not suggest that they are at all familiar with the process of cancer registration, nor with the uses of such data. The suggestion that cancer rates in a small area are likely to be a useful tool to assess the health impacts of an incinerator, is incorrect. I know of no reputable cancer epidemiologist who would agree with their assertion. They omit the main sources of error in such assessments, which are the underlying Poisson and extra-Poisson variation, the low number of cases expected in any small area, and the modifiable areal unit problem.

They do not describe the other problems, beyond saying that 'there are many others'.

They go on to conclude that as HIA is not possible, their preferred method, which is vaguely described, ought to be used. They seem to propose using measurement and models of emissions in some way, and they talk about identifying receptors, and the 'most vulnerable of the population'.

In short, they do not appear to be familiar with HIA processes, although the document is entitled 'Health Impact Assessment'. What has been done in this report is not any recognised form of HIA. Nor is it a proper data based risk assessment.

Population

Although small area population data are readily available from the 2011 and 2006 census, and details on the location of dwellings are readily available, for example from GeoDirectory, neither of these obvious data sources is used. Instead there is an impressionistic description of the major population centres in the area, with a digression on occupational exposure.

Incineration and Health

There are three paragraphs on the topic, critiquing, vaguely, the existing literature. No references are given.

Emissions

There is another review of the expected emissions, again impressionistic, and devoid of actual data, although much of the data required is elsewhere in the EIS.

Literature review

This is the bulk of the paper. No proper literature review has been done. There is a description of a very cursory literature search, in PubMed, which found 120 articles. Looking at the reference list in the report, there are a total of 23 references. No data is given on the relationship between these two numbers. Many of the references listed are not in PubMed (for example the FSAI press release - reference 15). It is not clear if the references identified were, in fact, reviewed. There is little indication, in the lengthy quotations, of any critical review of the content, even of the literature cited. For example, to conclude that the Ashworth review paper (14) on congenital anomalies is ‘reassuring’ is in my professional opinion, an incorrect assessment of that paper, and an inadequate approach to what may be real, albeit modest, risks.

Conclusions

The conclusion, in brief, is that there is no risk of any kind.

Comments

This document is of inadequate quality, even on its own terms. The authors do not seem to be familiar with the basic concepts of a health impact assessment, and many of their statements about the HIA process are incorrect. The literature review, which is the bulk of the report, has not been carried out using any reasoned scientific approach, nor to a reasonably acceptable standard. No reasonable person could rely on their assertion that ‘There has been nothing published in recent literature which would significantly change this position’. This may or may not be true, but the report does not contribute to an answer.

HIA for Ringaskiddy – an outline

To facilitate the inspector, I provide an outline of what an actual HIA for this site might look like. There are several descriptions in the literature of the stages of a HIA, but the outline is common to most. I will follow the CDC description provided earlier.

Stage	Content
Screening	Identifying plans, projects or policies for which an HIA would be useful
Scoping	Identifying which health effects to consider
Assessing risks and benefits	Identifying which people may be affected and how they may be affected
Developing recommendations	Suggesting changes to proposals to promote positive health effects or to minimize adverse health effects
Reporting	Presenting the results to decision-makers
Monitoring and evaluating	Determining the effect of the HIA on the decision

I assume that on screening, a major industrial project, holding large amounts of hazardous materials, located on a vulnerable aquifer, in a built-up flood-prone area, opposite a large higher

education facility, will require a HIA. Presumably Indaver felt the same, as they commissioned the report, which is clearly labelled 'Health Impact Assessment'.

Scoping is usually done in a number of stages. For this project, it would be logical to start with the EIS, which contains a detailed description of the impacts of the project on the surrounding community. It would also be desirable to update the literature, by doing a proper literature review. The next step would be a site visit, and a meeting with stakeholders. These would include local residents, community groups, local schools, local employers, and, in this case, the third level college across the road. The objective is to come to a consensus on the possible impacts, good and bad, and to agree a process for evaluating these.

My own brief consideration of 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; Bottom ash; Fly ash; Bag ash; Waste transfer; Waste spills; Flooding; Ground water contamination; Fire; Chemical release;

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.

The next step is to do the agreed assessment. In the case of Ringaskiddy, this might include an estimate of the additional exposure from the normal operation of the facility, including transport related emissions; exposure due to abnormal operation of the facility; risks to the local population associated with problems at the facility, including the scenarios outlined in Appendix 6.1 described above; impacts on other activities in the area, from the development; assessment of the impact of the loss (or gain) of amenities and employment; and more. A study of the local population to establish their current health status, and to identify any especially vulnerable groups or areas in the locality would be done. Much of this is a straightforward quantitative risk assessment, and the availability of small area census data from the 2011 census, would facilitate this. All of these assessments are quite routine, and, I suspect, could easily be completed within six to eight months, or faster if resources permitted.

Once this is done, the assessment is presented to stakeholders, with input from relevant experts, and recommendations are developed. These may or may not be agreed by all parties, but the objective is to present to decision makers, a menu of options, with an indication of the costs and consequences of each. This might take 4 to 6 weeks.

Finally a report is prepared for the relevant decision makers, and a process is put in place to monitor the outcomes of the development.

All of this is a routine process, done many many times each year in other EU countries, and entirely feasible here.

Dr Hogan's response

Dr Hogan's entire response to my original submission is as follows :-

'Submission CHASE (Anthony Staines)

The submission maintains that it was necessary to perform a stand-alone Health Impact Assessment.

Response

The methodology of the assessment performed and the reasons behind this has been outlined in the EIS Appendix 6.2. I do not propose restating that but would make the following points.

The method taken in the EIS is a valid method of assessment and in my opinion not only meets the needs of a project like this and is best practice.

The predicted environmental impact of the proposed development in terms of emissions is relatively slight. Based on the predicted impacts on air quality for example there will not be an adverse effect on human health and one does not need a stand alone Health Impact Assessment to show this⁶

In my view, this is entirely unresponsive to the points I have raised.

The document also contains Dr Hogan's qualifications. He has a primary medical degree, and qualifications in Occupational Medicine. He lists no evidence of training or competency in environmental health, public health, risk assessment, or impact assessment.

Conclusions

If it is desired to take account of health impacts of the proposed development, which I believe should be done, nothing provided in the EIS is capable of supporting any rational person making a reasoned decision on the presence, nature or magnitude of those impacts.

References

1. Scott-Samuel A. Health impact assessment—theory into practice. *Journal of epidemiology and community health*. 1998;52(11):704.
2. Scott-Samuel A. Health impact assessment. *BMJ: British Medical Journal*. 1996;313(7051):183.
3. Parry J, Stevens A. Prospective health impact assessment: pitfalls, problems, and possible ways forward. *Bmj*. 2001;323(7322):1177–1182.
4. Lock K. Health impact assessment. *British Medical Journal*. 2000;320(7246):1395.
5. Künzli N, Kaiser R, Medina S, Studnicka M, Chanel O, Filliger P, et al. Public-health impact of outdoor and traffic-related air pollution: a European assessment. *The Lancet*. 2000;356(9232):795–801.
6. Boldo E, Medina S, Le Tertre A, Hurley F, Mücke H-G, Ballester F, et al. Aphis: Health impact assessment of long-term exposure to PM_{2.5} in 23 European cities. *European journal of epidemiology*. 2006;21(6):449–458.
7. Vilain P, Pagès F, Combes X, Marianne Dit Cassou P-J, Mougin-Damour K, Jacques-Antoine Y, et al. Health impact assessment of cyclone Bejisa in Reunion Island (France) using syndromic surveillance. *Prehosp Disaster Med*. 2015 Apr;30(2):137–44.
8. Officer TH. Health Impact Project - Pew Trusts [Internet]. [cited 2016 Mar 7]. Available from: <http://bit.ly/1sEfCXo>
9. Taddei C, Gnesotto R, Forni S, Bonaccorsi G, Vannucci A, Garofalo G. Cycling Promotion and Non-Communicable Disease Prevention: Health Impact Assessment and Economic

- Evaluation of Cycling to Work or School in Florence. PLOS ONE. 2015 Apr 30;10(4):e0125491.
10. Mueller N, Rojas-Rueda D, Cole-Hunter T, de Nazelle A, Dons E, Gerike R, et al. Health impact assessment of active transportation: A systematic review. *Prev Med.* 2015 Jul;76:103–14.
 11. Drewry J, Kwiatkowski R. The role of health impact assessment in advancing sustainable development in Latin America and the Caribbean. *J Environ Health.* 2015 Apr;77(8):16–20.1.
 12. Haigh F, Baum F, Dannenberg AL, Harris MF, Harris-Roxas B, Keleher H, et al. The effectiveness of health impact assessment in influencing decision-making in Australia and New Zealand 2005–2009. *BMC Public Health.* 2013;13(1):1188.
 13. Haigh F, Harris E, Chok HNG, Baum F, Harris-Roxas B, Kemp L, et al. Characteristics of health impact assessments reported in Australia and New Zealand 2005-2009. *Aust N Z J Public Health.* 2013 Dec;37(6):534–46.
 14. Ashworth DC, Elliott P, Toledano MB. Waste incineration and adverse birth and neonatal outcomes: a systematic review. *Environ Int.* 2014 Aug;69:120–32.