

INDAVER ORAL HEARING

1.0 Introduction

1.1 Waste Treatment Facilities

For most industrial facilities, the EPA is neither required to, nor will, challenge the applicant as to the necessity – it is regarded as a commercial decision.

Similarly, the EPA has limited responsibility or power to question the processes to be employed – the applicant is assumed to have selected the process on technical or economic grounds.

The responsibility, and interest, of the EPA is directed solely to the environmental impacts of the proposed facility. If these are excessive then the EPA will require a reduction or refuse a licence.

Waste treatment facilities are different. They are the subject of regulation from inception, including the questions of necessity and fundamental processes to be employed, as well as specific environmental impact.

Indaver and the EPA are both bound to conform to EU directives, national laws and regulations and the EPA's own guidance.

These clearly require the following elements to be addressed:

- necessity: the waste hierarchy requires that wastes cannot be accepted for destructive treatment or disposal unless they cannot be re-used, recycled or recovered.
Each waste stream must therefore be shown to be irrecoverable.
- process: each waste stream must be further assessed to determine the best or most appropriate treatment or disposal process to be employed. This encompasses environmental, technical and commercial evaluation.
- environmental impact: for whatever process is selected, the best available environmental control technologies must be employed.

Obviously, these elements require a complex, interrelated analysis including risk assessment, cost-benefit studies, EIAs, etc for a range of options.

The various directives provide guidance and minimum standards.

The current proposal, from Indaver, appears substantial and, apparently, has been thoroughly reviewed by the EPA.

However, in my professional opinion the proposal is grossly and obviously inadequate in all important respects and does not meet any of the requirements for proper analysis.

No waste stream has been examined at all – it has been simply assumed that if the producer does not consider recovery worthwhile then recovery is not feasible. Similarly, no alternative treatment methods have been examined for any specific

waste stream – alternatives have not even been properly examined for the total waste, they have been simply summarily dismissed as unproven or totally ignored.

Finally, best available technologies have not been employed – the cheapest solution meeting the minimum regulatory standards have merely been employed.

The EPA have been complicit in a gross deception of the people of Cork and appear simply to be rubber stamping an obviously deficient and defective proposal.

Of course, at this point the analysis is independent of the technology, whether incineration or some other option. – The selection of the appropriate technology comes from the analysis – it is not acceptable to select the technology and then direct the analysis to justify the selection.

Since I cannot claim to have completed such an analysis I cannot eliminate incineration as a possible component of a waste treatment system.

However, I can say, with certainty, that incineration is neither essential nor sufficient.

I can also say that it is my opinion, based on considerable experience and knowledge of many of the aspects involved, that it is unlikely that incineration, as envisaged by Indaver, would be found, as a result of such proper analysis, to be the preferred or optimal solution. Furthermore, even if incineration were found to be less expensive than some alternatives (which is possible, but by no means certain), the electorate might not consider the difference significant, when set against the potential health and environmental impacts.

1.2 Professional Conduct and Competence:

I should like to emphasize that professional scientists and engineers are not supposed (and should not be permitted, in my opinion) to take sides in any such argument.

It is our task to identify and marshal facts, to undertake logical and objective analyses based on those facts and, finally, to express professional opinions (within our fields), when requested, that are sincerely held and cogently argued.

I was asked whether there were alternatives to incineration – the answer is obviously yes.

I was asked whether mass burn, mixed waste incineration was the best or most appropriate technology for all the wastes proposed. The answer is undoubtedly and emphatically no.

If asked whether thermal treatment technologies, in general, have a role to play in treatment of such wastes, my answer would clearly be – probably.

I was asked to review the Indaver application – my response was some 65 pages of comments and criticism. In summary, the Indaver proposal is inadequate, misleading, incorrect in some areas, of poor quality overall, but regrettably not much worse than many others. That, however, does not excuse the failure to meet the obligations and requirements of various directives, regulations and codes of practice, in spirit as well as letter.

Councillor D'Alton was quoted, by Kieran O'Brien, as being ashamed of the behaviour of some professional engineers, with regard to dispersion modelling of the Indaver emissions. Ms D'Alton was being polite and diplomatic.

I am inclined to neither politesse nor diplomacy – I am far too angry with many so-called professionals amongst Indaver, its consultants and, most particularly the EPA.

The EPA is supposed to be the bulwark defending the Irish people and environment against the ravages of marauding invaders, such as Indaver and its mercenaries, the consultants. There has been no significant criticism at all of the Indaver proposal, from the EPA – even with the comments provided by others.

I sent an email to the EPA last week requesting names, qualifications, experience and professional affiliations of those involved in the review of the licence.

I received the following, courteous, response. (Quote A) (email from EPA)

The EPA has stated, in writing, that it has the requisite resources and technical competence.

I am now disputing this and require the EPA to provide evidence.

Furthermore, I have both an inalienable right and a duty to pursue professionals that, in my professional opinion, may not be performing to the standards of integrity and competence demanded by their professional peers.

Neither Indaver nor the EPA has any right to silence in this regard and I must request the relevant information from both parties, so that if I so choose, I may make the relevant representations.

Failure to accept the scrutiny of independent professionals must necessarily reflect back on the entire organization. I cannot consider that either the Government or the EU Commission would be impressed by an Agency lacking professional credibility.

1.3 Prosecution under the Waste Licence Legislation:

The Waste Licence Application form makes it abundantly clear that the provision of false or misleading information, by the applicant, may lead to prosecution under the relevant Act.

I noted in my original submission that there appeared to be a number of instances where Indaver could be considered to be in breach of this rule and requested the EPA to ensure the matter was investigated.

I furthermore noted that the EPA could not itself take any action, since it must be precluded by a clear and obvious conflict of interest – one of the new directors of the EPA may be liable to prosecution.

I suggested that an external agency should be brought in to review the matter.

The EPA response was (Quote B) (memo from K O'Brien to EPA board)

Now, as to the first point there were numerous examples given in the submission, including:

- thermolytic (pyrolysis and gasification) techniques are not commercialised: false
 - Kalina cycle not commercialised: false
 - Environmental impact on Ringaskiddy not significant: false and misleading (the PSD classification was deliberately selected to permit the largest increments for air quality parameters – this is disgraceful)
 - Design optimised: false – not even fixed at the time
 - Most up-to-date technologies: false, in several respects
 - Maximum emissions (for modelling): misleading and false
 - Shutdown and storage requirements: misleading and false
 - Seveso classification: misleading
- Etc.

Any one of these could be excused as an error or oversight. The number, however, suggests a deliberate attempt to deceive. It is my opinion that there is prima facie evidence for an investigation.

As to the second point, the EPA is correct in that there is no provision for involvement of an external agency. Nor, however, is there a prohibition. Furthermore, it is not a licence review that is required, but a legal investigation.

I would also suggest that, since appointment of EPA directors is apparently a cabinet matter, no other department can be entrusted with the matter – all would be tainted by the same conflict of interest. The EU Commission or UK Environmental Agency should be requested to provide a team to review the matter.

Again, I must note that I have the right and obligation to raise the concern and that, once raised, it must be addressed.

1.4 Application Form:

A number of concerns were raised regarding current completion of the application form, including, for example map reference.

The EPA response, that the form is merely a guide and that non-adherence to the form does not constitute an invalidation of the application, is extraordinary and unbelievable. There is no reference to any such latitude and both the structure of the form and the instructions within it, clearly indicate that adherence is required and expected.

With regard to the map reference, the EPA provides very specific instructions. Are we to believe that the EPA welcomes a selection of map references and that, if the applicant is insufficiently numerate, will accept 6, 4 or even 2 figure map references (covering Northern Europe and Asia, perhaps)

I must demand that Dr Mary Kelly dissociate herself, and the EPA, from Mr O'Brien's statement. I cannot envisage any court accepting such a ludicrous argument.

2.0 Problematic Feeds

2.1 **Radioactive Materials:** Indaver will test for these with some form of scanner. I have already noted that there should be at least 2, and preferably 3, such scanners in operation, to ensure reliability. The EPA has not made such a condition.

2.2 **Explosives:** Indaver will not accept explosives. There are two problems:

- detection: there appears to be no intention of employing scanners to detect explosives
- classification: I have come across at least one instance of a chemical, in use for some years, being found to be explosive. Such materials may be consigned for disposal in tonnage quantities, albeit in 25 kg packages. The impact of such materials has not been considered

- 2.3 **Reactives:** Indaver will separate incompatible materials. There is no indication of how such incompatible materials remain segregated until safely incinerated.
- 2.4 **Asbestos:** Indaver will accept asbestos containing material at the transfer station but will not be authorised to incinerate it. However, ACM is generally defined as material containing $\geq 1\%$ w/w asbestos - material with $< 1\%$ asbestos is not considered to present an asbestos hazard. This, of course, is another, understandable, pragmatic and practical fudge.

But, because of the cost and difficulty of disposing of ACM, some unscrupulous people dump ACM with MSW, which will also contain wastes with $< 1\%$ asbestos.

Asbestos is not destroyed by incineration, but will be freed from any matrix in which it is bound. Free asbestos fibres will be carried through with exhaust gases and collected in fly ash and filter cakes, but the majority will be found in the bottom ash.

It has already been noted that vitrification (or similar techniques) is BAT, but the potential for asbestos contamination renders it imperative.

- 2.5 **Microbiological contaminants:** medical waste, meat and bone meal and other wastes may contain pathogenic bacteria, viruses and prions. Incineration will certainly destroy these. However concerns must be raised regarding the receipt, storage and transfer of these materials to the incinerator.
- 2.6 **Toxics:** similar concerns must be expressed regarding the feeding of toxic materials to the incinerator. Contamination of a bunker with certain toxic materials cannot be accepted.

Generally, such materials are incinerated by feeding them encased in closed drums, directly to the incinerator. This is not possible for a fluid bed - which may be why such incinerators are not commonly used for hazardous wastes.

- 2.7 **Water-reactive materials:** these are commonly employed in the pharmaceutical industry, together with pyrophoric (oxygen reactive) materials. If such materials enter a bunker there is a significant risk of fire. Adding water to extinguish a fire of water reactive materials is then decidedly inadvisable - there may be an explosion and greater fire.

Again, such materials would normally be fed to the incinerator encased in a sealed container.

It should be noted that all of these problems are readily solvable. However, if Indaver does not wish to address a problem it must then undertake a quantitative risk assessment to demonstrate that this problem is not a significant concern.

3.0. Health Aspects:

The EPA and Indaver have both maintained that incinerators in general, and this incinerator in particular, do not represent a significant health hazard. Neither have made any attempt to estimate the health impact, as we have already heard – both parties rely on the assumption that operation within the specified emission limits necessarily implies minimal health impact.

First, it is accepted that incineration gives rise to emissions and that these can, and have, caused health problems. It is assumed that the health risk is directly proportional to the concentrations of the emissions – a not unreasonable assumption but certainly not proven

Second, it is also generally accepted that there is no concentration below which a pollutant may be deemed totally innocuous. Thus, it is simply a question of probability, of numbers of affected people and assumptions or estimates of societal acceptance of risk

Third, it is assumed that operation will be within the specified limits and that failures will be immediately or rapidly noted and stopped. It is also assumed that it is the long-term average exposure that is important. These assumptions are incorrect or not proven – dioxin monitoring is such that failures may not be noted for weeks.. Exposure to high concentrations for short periods may give rise to different health impacts than exposure to lower concentrations for long periods.

In fact, it is possible to estimate the health impact of the Indaver plant (Quote C) (CIWM report)

This may, or may not, be acceptable. However, no accuracy is given – it could be one admission or death per 10 years or it could be 10 or more per year, the latter being probably unacceptable.

The biggest problem, of course, would be determining whether an increase had occurred – for no baseline survey of relevant health problems has been done in Cork. Another problem is that there are many more sub-lethal impacts – increased incidence or severity of asthma and allergies, for example.

It is essential, therefore, to include a baseline health study as part of the EIS and repeat this at 5 or 10 years intervals, post-Indaver.

If this is not done then Indaver may have a serious difficulty.

The Supreme Court, in the MSD-Hanrahan case, found against MSD purely on the basis that it existed and had emissions of potentially damaging chemicals and was therefore the probable cause, in the absence of any other more probable cause.

Using this precedent, if anybody in Cork, subsequent to the start-up of Indaver, suffers any pulmonary problem or contracts any of a wide range of cancers, which cannot be ascribed to an obvious cause (such as genetics or smoking), they may sue Indaver – and expect to win.

If, however, Indaver undertakes a baseline health survey and a quantitative risk assessment, which is accepted, then they would have a defence – unless the incidence of disease exceeds the projected acceptable levels.

4.0 **Dioxins, Surveys and Incinerators:**

The EPA has undertaken, or organized, a number of surveys on dioxin levels.

These, however, can be described as inept, inadequate and deliberately misleading. For example, the inventory of dioxins was nothing more than a crude estimate of potential emissions – it involved no actual measurements.

Even worse have been the surveys of dioxin levels in milk and the emphasis on the 11 incinerators already in existence. The EPA has asserted that these surveys have been extensive – they have not – and that the results confirm that incineration does not lead to increased dioxin levels in the environment.

This latter assertion is a deliberate and blatant fraud.

One of these incinerators is the Lawter/Eastman incinerator in Waterford – well known to the EPA. This incinerator handled small quantities of hydrocarbon liquids and gases, with no halogenated hydrocarbons at all. Furthermore, it had no emissions treatment systems.

Some of the other incinerators do process halogenated hydrocarbons – but always in small quantities, with minimal particulates, no energy recovery and for limited periods. In addition, the halogenated materials are almost invariably solvents such as methylene chloride or gases such as methyl chloride – which do not contain the aromatic structures required for dioxin formation.

None of these 11 incinerators would be regarded as remotely comparable to Indaver – otherwise they would have to be equipped with similar treatment systems, which they are not. Therefore they cannot be used to model Indaver and have little or no predictive value in terms of major incinerator impact.

This is, of course, well known to the EPA – and yet they continue to permit misleadingly optimistic assessments to be promulgated.

Nor have the studies taken note of the earlier, more relevant incinerators – for hospital waste, crematoria or the Shannon Airport domestic waste incinerator – or similar furnaces, such as a precious metals recovery furnace also in Shannon.

In reality, the EPA are regarded as one of the most backward organizations in the world in terms of proper dioxin monitoring and analysis. The level of information available from Ireland is amongst the lowest in Europe.

5.0 **BAT:**

Indaver has asserted, with EPA complicity, that BAT is employed at all levels.

It is not employed at any level.

5.1 **Base – BAT for Waste Feeds:**

Waste solvents can always be recovered in as pure a form as is required – this would therefore be regarded as BAT.

However, in some cases, the cost or environmental impact of recovery is excessive, so that other treatments must be considered. But this may still depend on other factors, such as quantity, required purity and even source treatment.

Indaver and the EPA have assumed that the waste producers have eliminated any possible recovery scenarios, before a waste is discarded. This is a ludicrous and blatantly false assumption. The producers simply offer their waste solvents to the lowest bid for disposal – whether recovery or incineration does not concern them.

Furthermore, there is little or no effort to maintain segregation to facilitate recovery, unless the recovery is on-site.

In short, I would anticipate that as much as 90% of the waste solvents could actually be economically recycled – given the minimum of effort.

5.2 Technology – BAT:

5.2.1 BAT for waste solvents incineration with energy recovery is, for most solvents, a simple boiler or CHP system. Such solvents, containing no solids or halogenated chemicals, do not require an incinerator with substantial emissions treatment. Energy recovery is significantly improved.

5.2.2 BAT for thermal treatment is probably an integrated pyrolysis system or pyrolysis followed by incineration or a cement kiln.

This leads to a substantial reduction in both total dioxin formation and release – partly because dioxins do not form readily under pyrolytic conditions and partly because of vitrification of the residues.

5.3 Emissions – BAT:

5.3.1 SCR versus SNCR: Indaver have selected SNCR for control of NO_x.

However, most modern incinerators are equipped with SCR, which undoubtedly is significantly more effective than SNCR. It is, though, more expensive.

The SEPA, I believe, requires applicants to either use SCR or to undertake a cost-benefit analysis to justify use of SNCR.

But SCR has one further advantage – it can be employed to destroy, rather than simply capture, dioxins in the waste gas stream. For this reason, if no other, SCR must be regarded as the BAT.

5.3.2 Waste Heat Recovery: in France it is prohibited to mix hazardous and non-hazardous wastes. It would be preferred to reduce the size of the hazardous waste incinerator and increase the size of the non-hazardous waste incinerator.

One reason for this is that waste heat boilers have been found to increase dioxin formation, especially in hazardous waste incinerators. In the USA this has led to such boilers being removed from the system, although it is also feasible to increase down stream dioxin removal.

BAT is probably best served by eliminating heat recovery from mixed hazardous wastes incinerators (such as Indaver's) and only permitting it in non-hazardous waste incinerators or non-halogenated hazardous wastes. At the very least, a cost-benefit

analysis should be undertaken to demonstrate the value or otherwise of the energy recovered.

6.0 Meteorological Inversion

I am particularly irritated by the behaviour of Indaver and the EPA over this topic. The UN guidelines, not to mention common sense, advise against siting waste incinerators in areas where inversions are commonplace.

One of the key purposes, and benefits, of soliciting public comments on projects and developments is to avail of, or obtain, local knowledge.

In this case, local knowledge has clearly identified inversion as a relatively common phenomenon.

The EPA has responded with the assertion that there is no reliable data on the relevant area and that the nearest location with suitable meteorological data, Cork Airport, was used. Cork Airport was, of course, sited for reasons that would make it unlikely to experience the level of inversions likely to be experienced elsewhere.

However, inversions are measurable phenomena. The EPA and Indaver have had more than 12 months to obtain suitable data.

One does not debate measurable quantities – one measures them.

It must therefore be advised that measurement sites be set up and monitored for the next 12 months. Cut-off points should be agreed at the start- perhaps 1% on an hourly basis or 3% of days. If inversions are found to exceed the cut-off points then the incinerator must be sited elsewhere.

I should also add that the EPA has substantial circumstantial evidence of the level of inversions around Cork – their complaints file of odours in the harbour area, from Irish Steel and various pharmaceutical and chemical companies. Many of these complaints must be down to interference with dispersion by meteorological phenomena – because they do not always match known events or excessive emission levels, which are well monitored.

The EPA is also reminded that it espouses the Precautionary Principle, amongst others. This would clearly mitigate against approval of the site.

6.0 EIS:

A long list of deficiencies, omissions and criticisms has been presented to the EPA.

The inadequacy of the EIS was even noted at the planning stage.

The EU has made it clear that no project, requiring an EIA, should proceed unless and until the EIS has been completed to the requisite standards.

The EPA must, therefore, require Indaver to complete, or even re-do, the EIS, before any final determination can be given.

If this final EIS is materially different from the current EIS, which is inevitable, then a further round of public consultations and review must be organized.