

EPP2 (S)

**APPEAL BY ISLAND GAS LTD, PORTSIDE
ELLESMERE PORT**

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**SUMMARY PROOF
AIR QUALITY AND PUBLIC HEALTH**

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EXPERIENCE

My name is Andrew Watterson and I am Emeritus Professor of Health PhD CFIOSH, Fellow Collegium Ramazzini , Faculty of Health Sciences, Stirling University. From 2000 – 2017 I was the Director of the Centre for Public Health & Population Health Research at Stirling University. From 2000 to date. I have been the Head of the Occupational & Environmental Health Research Group at Stirling University.

In this period, I was also a Visiting Professor, University of British Columbia Dept of Health Care & Epidemiology and a Visiting Professor, University of New South Wales, Sydney, Australia. I am currently Journal Editorial Board member of two journals :- Environmental Health (BMC) , and New Solutions Journal of Occupational and Environmental Health, Health (the only journal that explores the growing, changing common ground at the intersection of health, work, and the environment). Previously I was Professor of Occupational and Environmental Health at De Montfort University, Leicester and Head of the Centre for Occupational Safety & Health in the Department of Mechanical Engineering at Nottingham Trent University.

I am a past member of the HSE Working Group on rubber dust and fumes and a past member of the HSE Chemag Working Group

1. Introduction

- 1.1 At the beginning of my full Proof of Evidence I set out eight questions to which answers are needed in order to evaluate hazards and risks for air quality and other public health risks for a project like the IGas proposal in Ellesmere Port. Assessments should draw on the latest research information from independent peer-reviewed sources and not rely solely on data from industry or a company to identify hazardous materials. They should recognize where data gaps could indicate risks and establish with a high degree of accuracy the likely population to be exposed. My full Proof of Evidence identifies the relevant information where it is available, valid, and of good quality, and comments on data gaps that might affect public health risk assessments, models and methodologies used.
- 1.2 Sources of poor air quality activities and impacts associated with Unconventional Gas Extraction (UGE) include vehicle movements, muds, cuttings, fluids used for acidisation or 'fracking', generators and pumps, flowback and produced water, gas venting, gas flaring, hydrocarbon production, condensate tanks, well workovers and maintenance and pipelines.
- 1.3 A high hazard with no exposure, and no exposure can never be guaranteed, would present little risk but in some instances very low exposures to certain hazards such as endocrine disruptors at parts per trillion and other chemicals on their own and in combination could present very high risks to communities especially the highly socio-economically disadvantaged ward that borders the site.
- 1.4 DEFRA's air quality expert group on shale gas and air pollution highlighted "*the current lack of knowledge regarding on-shore shale gas extraction activities and its environmental impacts in the UK context*". This is why a cautious approach to protect public health should be taken to any UGE proposal and, where there are data gaps and omissions in project proposals, the benefit of doubt should be with local communities.

2. Assessing air quality at the proposed IGas site at Ellesmere Port

- 2.1 There appears to be some debate about the type of extraction to be used by IGas. The company is clear that acidisation will be used to extract shale gas. Others are less clear that this does not involve 'fracking' in some form and will not do so in the future. My full Proof looks at UGE with particular reference to acidisation and its links with and possible effects on air quality.
- 2.2 IGas have not provided exact details of all the chemicals and materials to be used in the tests or how exactly they will be used and no public health life cycle analysis of the test proposal is available or modelled in any form. It is therefore unclear to me what chemicals IGas will be using and how their process will differ from the various US acidisation shale gas extractions or which form of acidisation will finally be used. These facts make any comprehensive modelling and assessment of poor air quality levels provided and risks from the test site necessarily incomplete.

3. State of Knowledge 2014 -2018 Relevant to the Proposed Development

- 3.1 In my main Proof I set out a table showing the range of chemicals that for example may be used in shale gas extraction and could contribute to allergies and asthma through poor air quality. Some will be produced by the IGas test site activity. The table highlights the importance of using risk profiles involving several substances rather than single predictors. These are the multiple insults that cannot be taken in isolation.
- 3.2 My main Proof also details a range of recently published research on the air quality and emissions impacts of UGE in the UK and the US. This new evidence needs to be taken into account. I note the relevance of research findings from other countries to the UK can be disputed for various reasons including geology and geography, population density and other factors. Sometimes, it is argued, risk may be over-

estimated and at other times risk may be under-estimated. However, the UK UGE industry, governments and sometimes regulators often make a case for using the USA especially Pennsylvania as an exemplar of good practice. INEOS and other companies have done so at many public meetings on shale gas because they argue the US companies have learnt from bad practice during the early development of UGE and have now done most research.

4. Air Quality and Risk Management relevant to Ellesmere Port

- 4.1 The Ellesmere Port SMR for respiratory disease is 70% higher than England's as a whole. This should be a factor linked to efforts to improve air quality not maintain or reduce its quality further. For all Cheshire West and Chester, it is reported that 'children generate around 250 admissions per year for lower respiratory tract infections. The rate of 390 admissions per 100,000 under 19s is significantly higher than England'.
- 4.2 Additional industrial developments, even for a very short period of time, can add unnecessarily in however large or small a way to the air pollution burden of the area for no benefit to public health. They can impact especially on local communities where health profiles are poor. This is because for example "*subjects with chronic respiratory diseases such as chronic obstructive pulmonary disease (COPD) and asthma are especially vulnerable to the detrimental effects of air pollutants*". UK NHS also recognise air pollution as a trigger for asthma. So, if air quality declines daily over for example 4 months, then populations like those above could be adversely affected and especially those close by as later sections identify
- 4.3 The Ellesmere Port populations likely to be affected by the IGas project have changed over time as has their proximity to the site. Environment Agency documents appear to cover only residences at 700m. Since those documents were produced, a new housing estate has been built apparently 320m away from the site, of which the EA was unaware. Discrepancies about population location and related risk assessments

in the documents are a serious cause for concern. If the potential additional exposures that could occur to those working around the site but not in it - even closer than the residents – are factored in, there is even greater cause for concern.

- 4.4 In the US there is still confusion after several years of UGE and disagreement about what are safe distances to protect residents from exceeding established limits. Current standards are inadequate. Some US studies consider there is no such thing as a ‘safe’ set back zone. Others called for additional setbacks where vulnerable groups are found and agreed setback distances should always be greater than ¼ mile (402m) and some argued for 2 mile set back zones.

5. Techniques Necessary to Fully Assess the Public Health Threats, if any, from Air Quality Impacts of the Proposed Development

- 5.1 The English government shale gas air quality expert group flagged that *“in order to enable evaluation of the impact on local air quality, a full well lifecycle analysis is required for a range of pollutants relevant for a range of issues including health, and agricultural and natural ecosystems”*. This analysis has not been provided by IGas or any of its air quality consultants and is a major shortcoming.
- 5.2 Communities have concerns about the social licence to frack or acidise. One of their concerns is the potential or perceived threat to public health from air pollution linked to the need for adequate health impact assessments of projects and proper consultation. The latest independent peer reviewed evidence indicates UGE creates poorer air quality and adverse public health impacts apply to local communities and global populations. It is difficult to see how either test drilling, flaring or other onsite activities producing inevitable air quality impacts will contribute in any way to local public health or fit with any council’s sustainable development objectives.

6. External Assessments of the IGas Ellesmere Port Proposal

- 6.1 The IGas consultants correctly provide several caveats, limitations, exclusions and estimations in their air quality supplementary report. They conclude none of these things indicate a serious problem with the proposal. From a public health perspective, however, all these factors remain causes for concern.

Environment Agency Assessment

- 6.2 The EA permitting decisions variation document from November 2017 included requirements for further monitoring, noting omissions and errors within previous IGas documentation, indicating the previous risk assessments lacked necessary information. These also include omissions about residential use flagged by the Environmental Protection Team from Cheshire West and Chester linked to questions about receptor siting.
- 6.3 It is not possible to assess fully the chemicals used without access to all the documentation. It is unclear how flaring pollution and risks from impurities can be 'considered negligible' if no one knows what exactly will be used and liberated, what should be monitored exactly and how, and what might be the shale composition and contaminants.
- 6.4 The Environment Agency assessment of the IGas permit application for well testing activities on the site was not a public health impact assessment nor did it consider a wider environmental health impact assessment of the proposal. It did include suggestions for additional information needed prior to any decision being taken on the proposal but considered the proposal low risk from an air quality perspective. In my main Proof I set out a number of caveats made by the EA that merit attention.
- 6.5 The EA approach to the proposal at the time was reasonable. With the changes that have taken place, it is appropriate to re-assess the chemicals to be used, populations and locations now impacted by the proposed site.

IGas's Statement of Case, Golders' Report and Smith Grant Consultants' Report

- 6.6 In my main Proof I set out how a number of the conclusions drawn by IGas and their consultants on air quality could be viewed as highly hypothetical and speculative. I also emphasise that there is a serious and major question concerning the assessments: the lack of a full and up to date assessment of air quality impact of diesel vehicles when the development will necessitate a high number of vehicle movements.
- 6.7 The IGas statement of case which contains appendices from consultants dated July 2018 makes no specific reference in the main body of the report to any air quality impacts from diesel due to site operations – either with diesel from plant and machinery or from transport into and out of the site. There are two brief references in the 202-page document to diesel linked to road traffic from other sources but not from the IGas proposal. The traffic and transport section of the IGas statement also make no specific reference to poor air quality from diesel vehicles. The route for vehicles into the site passes numerous workplaces and there are residential properties to the SE of the road chosen. From the maps available it would appear that this route is outside the 2018 AQM area No 1 for Ellesmere Port.
- 6.8 The consultants' reports examine potential vehicle and plant emissions but also do not refer specifically to diesel exhaust emissions. In addition, there appears to be no reference anywhere in the IGas statement of case to the diesel generating station. Yet all these activities will be contributors to poorer air quality with possibly adverse public health effects from the test site.
- 6.9 The air quality report by Smith Grant Consultants (SGC) on behalf of IGas for their appeal gives useful detail on the AQIA modelling, additional analysis, consultee responses and additional considerations and observations on the initial Golder report prepared for IGas. It does identify certain limitations pertinent to the planning regime linked to the need to look at the scale of changes in pollutants. The SGC report noted the Golder report did not "*discuss or consider other potential aerial emissions that may be generated by the Proposed Development such as vehicle exhaust emissions, non-*

road mobile machinery (NRMM) or dust". Whilst SGC did not consider such sources as 'likely to be significant', that is not evidence that they will not be.

6.10 The meteorological modelling by Golder drew on data from Liverpool Airport which is 5km east of the proposed test site. SGC noted there will be local variations in conditions but these data were considered appropriate. Following the review of the Golder report by SCG, Golder made additional contour plots, but there will be concerns about the location of the receptors, the later plotting undertaken and the modelling data thus generated. As SGC observe "*...from the information presented it is not possible to determine the predicted PCs at these locations*" in what could be considered a major public health shortcoming of these types of AQIAs.

6.11 There is an additional problem of using the absence of evidence as evidence of absence, as the IGas Statement of Case appears to do. To state that no relevant technical consultees raised objection during the planning process cannot demonstrate that the project ensures residents' health and well-being, especially if no directors/consultants/advisors on public health were consulted. The Council's public health and sustainability concerns have substantial validity and appear in line with the state of knowledge. Nothing in the IGas appeal documents deals effectively with these public health objections to their proposal.

7. Conclusions

7.1 The government's policy in favour of shale gas development does not support developments that will have a negative public health impact. The balancing act between some forms of economic development and maintaining or improving public health has shifted significantly since 2010. This is based on good scientific evidence in favour of public health and reducing global climate change impacts through poor air quality and greenhouse gases that impact on every locality. From a public health and air quality impact perspective, the IGas proposal does not appear to demonstrate sustainable development but rather the opposite.

7.2 In terms of the specific questions posed at the start of my main Proof, not all the project hazards were initially identified or have been fully now. The effects of these hazards combined, and with other hazards in the area, has not been fully factored in to risk assessments of human health linked to multiple pathways to the population around the site. The size and vulnerability of that population has not been fully considered. The capacity to assess the risks of negative air quality impacts to human health is limited and incomplete. The human receptor siting and measuring have been problematic. The evidence base for establishing the risk level is incomplete. The proposal does not reflect the latest peer-reviewed independent research.

Andrew Watterson

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