



PRCC.12 11/12
Prosperous Communities Committee
28 September 2011

B

Subject: Report from Motion Task and Finish Group Meeting of 20th July 2011 - Motion from Councillor Underwood-Frost - Pollutants affecting the West Lindsey District Council Area

Report by:	Councillor Jeff Summers Chair Motion Task and Finish Group
Contact Officer:	Chris Allen Public Protection Services Manager 01427 675133 Chris.allen@west-lindsey.gov.uk
Purpose / Summary:	The purpose of this report is to advise members of the Prosperous Communities Committee of the outcome of the first meeting of the Task and Finish Group established to investigate the motion from Councillor Underwood-Frost and the recommendation from the Group that no further investigation be carried out at this time and that the Group be dissolved.

RECOMMENDATION(S):

- (a) Members of the Committee are recommended to agree with the recommendation from the Task and Finish Group and accept the evidence presented by experts that has found no causal link between air pollution in the West Lindsey area and cancer rates within the population of West Lindsey and to support the recommendation that no further investigation of this matter is warranted at this time.**
- (b) On the basis that Members approve the recommendation at (a) above, Members are invited to dissolve the Task and Finish Group established to investigate the motion from Councillor Underwood-Frost.**

IMPLICATIONS

Legal: Agreeing to the recommendations contained in this report will not lead to any legal implications.

Financial: If members were minded to request a continuation of investigations into the motion from Councillor Underwood Frost there would be financial resource implications in respect of the commitment of our own Officer resources as well as purchasing expertise from public health services at a cost.

Staffing: Supporting the initial work of the Task and Finish Group has been achieved using existing staffing resources and with support of Public Health colleagues at NHS Lincolnshire. If further work is required beyond the initial scoping meeting of the Task and Finish Group then it will be necessary to re-assess the time commitment required from staff and to determine the impact on delivery of statutory service responsibilities and corporate priorities. A commitment from NHS Lincolnshire colleagues would also be necessary and would be subject to the same constraints as detailed for WLDC staff.

Equality and Diversity including Human Rights: There have been no equality or diversity issues identified as a result of this study.

Risk Assessment: There is a risk that community concerns over pollutants in the district may be raised and that those concerns will not be satisfied by expert opinion. Our Communications Team will need to be engaged to assist in the delivery of any messages to the public as a result of this report and the Committees decision.

Climate Related Risks and Opportunities: There are no climate change related risks and opportunities as a result of this report.

Title and Location of any Background Papers used in the preparation of this report:

Appendix A: Presentation by Chris Weston, (BA, MPH, FFPH) – Consultant and Assistant Director of Public Health, NHS Lincolnshire called: Coal Fired Power Stations, PFA and Cancer

Appendix B: Presentation by Chris Allen – Public Protection Services Manager, West Lindsey District Council called: Air Quality Management in West Lindsey.

Call in and Urgency:

Is the decision one which Rule 14 of the Scrutiny Procedure Rules apply?

Yes No

Key Decision:

Yes No

1 Introduction

1.1 At the Prosperous Communities Committee meeting on 8th June 2001, Members resolved that a Task and Finish group comprising those members detailed below be established in order to firstly analyse available data with a view to undertaking a scoping exercise thereafter.

Councillor Nigel Bowler
Councillor Jeff Summers
Councillor Chris Underwood-Frost
Councillor Geoff Wiseman
Councillor Trevor Young

1.2 At the meeting Members were in agreement that any work would need to be scoped however there was a general consensus that in the first instance a Member Task and Finish Group would analyse all of the available data to determine whether the evidence supported the assertion, or not, put forward by Councillor Underwood-Frost in his motion to Council.

2 Reviewing the evidence

2.1 Following the recommendation from Prosperous Communities Committee, Officers commissioned colleagues from the Public Health department at NHS Lincolnshire to undertake the following:

2.1.1 Review of health data relevant to the whole population of WL and drilling down to the Gainsborough area to identify any spikes or clusters of health related issues that might indicate a causal link with local air pollution or to power stations burning coal.

2.1.2 Comparison of health data relevant to the whole population of WL with health data for an area not exposed to local power station emissions with a similar demographic to determine whether patterns of health related data are typical for the population such as WL.

2.1.3 If issues are identified, suggest what further investigations or research may be appropriate that might provide public reassurance about the environment of Gainsborough and WL as a whole

- 2.2 Chris Weston, Consultant and Assistant Director of Public Health at NHS Lincolnshire completed the research request and made a presentation of his findings to the Task and Finish Group meeting held on 20th July 2011. The PowerPoint presentation produced by Mr Chris Weston is attached at **Appendix A**.
- 2.3 Following the recommendation from Prosperous Communities Committee, officers from West Lindsey's own Public Protection Team undertook the following:
- 2.3.1 Review historical Air Quality Management reports prepared for the WL area in accordance with the Air Quality Management Regulations and present a summary of the findings.*
- 2.3.2 Commission a review of historical air quality monitoring data from the automatic monitoring site in Gainsborough Cemetery managed by West Burton Power Station and present a summary of the findings.*
- 2.4 Chris Allen, Public Protection Services Manager completed the research request and made a presentation of his findings to the Task and Finish Group meeting held on 20th July 2011. The PowerPoint presentation produced by Mr Chris Allen is attached at **Appendix B**.

3 Conclusion

- 3.1 Mr Chris Weston from NHS Lincolnshire presented the following conclusions to the Task and Finish Group from his review and analysis of health evidence:
- *West Burton (nearest coal fired Power Station to Gainsborough) is operating well inside legal EA set regulations for particle emissions*
 - *Expert testimony from a variety of independent experts (including the regulator) strongly refute a health problem from PFA (pulverised fuel ash)*
 - *The NRPB seminal study suggests yearly exposure to natural PFA radiation is 'trivial' and miniscule compared to average annual exposure (e.g. from the sun)*
 - *There is no spatial link present in cancer mortality, cancer admissions (inc long term residents) in the area.*
 - *There is no increased cancer rates in the area from hypothetically 'linked' cancers*
- 3.2 Mr Chris Allen from West Lindsey District Council presented the following conclusions to the Task and Finish Group from his review and analysis of air quality evidence:
- *Our local air quality management report for 2010 shows that air quality objectives for all pollutants was met.*

- *This has been the case since the first Air Quality Assessment was required.*
- *WLDC has never been obliged to declare an Air Quality Management Area or undertake more detailed monitoring or assessments.*
- *All our air quality reports have been submitted to DEFRA and approved by them as acceptable.*

3.3 Having completed research and analysis of available data, both experts took the view that there is no causal link between cancer rates and PFA and that air quality within the West Lindsey area meets statutory (health based) air quality objectives.

4. Recommendation

- 4.1 Given the conclusions reached above, experts expressed the view that there was no evidence to support the motion put forward by Councillor Underwood-Frost and upon that basis scoping of further work by the Task and Finish Group would not be helpful.
- 4.2 Experts did express the opinion that the study initiated by the Motion put forward by Councillor Underwood-Frost had been a useful exercise and they hoped that the findings would help to allay any public concern expressed by local residents.
- 4.3 Members of the Task and Finish Group were invited to accept the evidence presented by experts that has found no causal link between air pollution in the West Lindsey area and cancer rates within the population of West Lindsey and Members of the Prosperous Communities Committee are asked to support the recommendation that no further investigation of this matter is warranted at this time.
- 4.4 On the basis that Members approve the recommendation at 4.3 above, Members are invited to dissolve the Task and Finish Group established to investigate the motion from Councillor Underwood-Frost.

Coal Fired Power Stations, PFA & Cancer

Chris Weston BA, MPH, FFPH
Consultant & Assistant Director of Public Health
NHS Lincolnshire

Overview

- Introduction
- Overview of process in producing PFA
- Examination of actual stack emissions vs. a vs. legislation
- Literature review and expert testimony
- Examination of cancer rates (spatial)
- Examination of cancer rates (types of cancer)
- Conclusions & Recommendation

Introduction

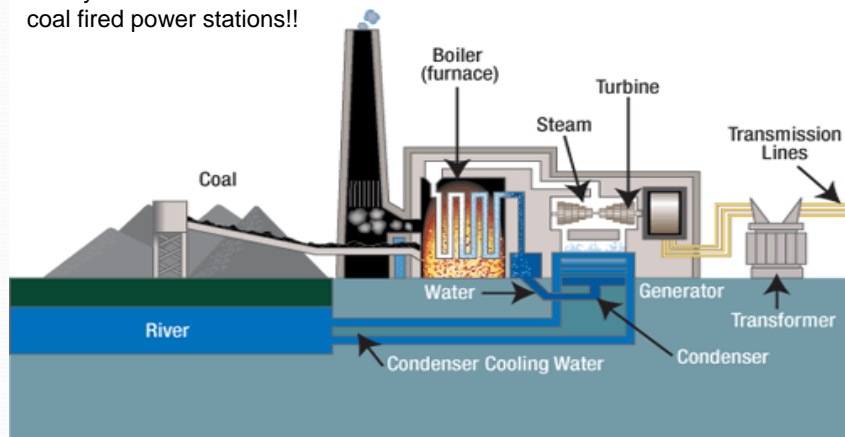
- NHS Lincolnshire approached to assist the investigation by WLDC
- The research question posed:

'Could PFA from local coal fired power stations be causing cancer in the residents of West Lindsey?'

- Methodology followed.
 - Legislation vs. actual emissions, Lit Review, Examination of cancer rates spatially and geographically plus review of air quality data.

Overview of process

A very basic view of coal fired power stations!!



Specific PFA Production

- At the power station, the coal is ground to a fineness similar to cement and then blown into the boiler furnace with air. The coal burns within 3–4 seconds
- The PFA and cenospheres (molten beads) pass out of the furnace area with the flue gas.
- The rapid cooling experienced by the ash particles as they pass out of the furnace causes them to solidify to form an amorphous, glassy material.
- 99% of PFA particles leaving the furnace are captured from the flue gas by electrostatic precipitators (ESPs)
- Collected PFA used as a building aggregate, concrete production, filler etc

Actual Emissions from WB Power Station

- Particulate levels in the stack gas released by the West Burton are very low, as more than 99% of the particulate matter is removed by the combination of the electrostatic precipitators and flue gas desulphurisation pollution control equipment
- The emission limit set in the Environment Agency permit for the total particulate concentrations is 25 milligrams (thousandths of a gram) per cubic meter of flue gas.
- The actual concentrations in the West Burton stack gas are well below this level and typically in the range of 3 to 6 milligrams per cubic metre of flue gas.

Actual Emissions (cont)

- The particulate in the stack gas is almost entirely composed of coal ash particles that have not been captured by the abatement equipment, together with a small amount of gypsum product from the flue gas desulphurisation equipment.
Coal ash particles are very small spheres, which (like the coal ash that is deposited to landfill) are inert, with elements from the original coal being locked into the particle structure.
The gypsum produced in the desulphurisation equipment is sold and used to manufacture plasterboard.
Neither material presents a particular health hazard, especially at the very low concentrations at ground level.
- The stack gas released from the station also contains trace elements. These are not routinely monitored, because the concentrations are so low, but the power industry has carried out test monitoring at regular intervals to obtain emission factors for annual "Pollution Inventory" reports to the Environment Agency, covering all emitted substances from station operations. These monitoring exercises continue to confirm that there are no significant concentrations in the stack gas of any other trace materials that could present a health concern.

Actual Emissions (cont)

- Dispersion modelling of the stack plume shows that the maximum resulting ground level annual mean concentration of particulate was $0.06 \mu\text{g}/\text{m}^3$ (micrograms per cubic metre), compared to the air quality objective of $40 \mu\text{g}/\text{m}^3$.
This is confirmed by the results from the ambient air quality monitoring stations that EDF operate in the area around the power stations.
This demonstrates that the particulate emissions from the stack have no significant impact on local air quality.

Results from Lit Review

- Full lit review carried out (June 2010) by LKRS
- Main research paper –

Radiological Impact on the UK Population of Industries Which Use or Produce Materials Containing Enhanced Levels of Naturally Occurring Radionuclides: Part 1: Coal-fired Electricity Generation

Smith et al, NRPB- R327, March 2001

NRPB Report Conclusions

- In brief (as very detailed and thorough), report exhaustively examined radiation from PFA to workers/residents from environmental exposure:

'The IAEA has concluded that a level of dose of some tens of microsieverts a year could reasonably be regarded as 'trivial' by regulatory authorities. The maximum predicted dose to members of the public from stack releases and ash piles are, at approx 1.5 uSv y⁻¹ significantly lower than the IAEA 'trivial' level'

In context, releases of radionuclides from coal fired power stations result in doses of at most a few microSieverts a year. The average exposure to a member of the UK population is just over 2000 microSieverts, most of which comes from exposure to natural radiation (eg the Sun, radon, x-ray equipment etc)

Expert Testimony

- Health Protection Agency:

'the amount of radioactivity released [from power stations] is very low and poses no significant hazard'

- UKQAA, Dr Lindon Sear, Chief Scientist:

I can assure you the potential for releases of radiation from coal fired power station products has been investigated by the experts in the field, e.g. NRPB and HPA, and they have concluded there are no additional significant risk to either members of the public or power station employees.

- EDF Energy:

'99% of PFA is captured by the precipitators fitted to the station flue gas exhaust, so dispersion of ash through the air from the station stack is not significant.

... coal ash does not present a significant radiological risk to health'

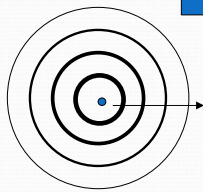
Expert Testimony (Regulators view)

- Environment Agency (Regulator) (Andrew Plant, EPR Officer, West Burton):

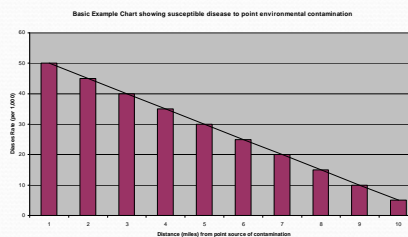
'... it has been concluded that [radiation] is so low and comparable with the natural background radioactivity that PFA is unlikely to be a substance that is cause for concern'

Do local cancer rates suggest an issue?

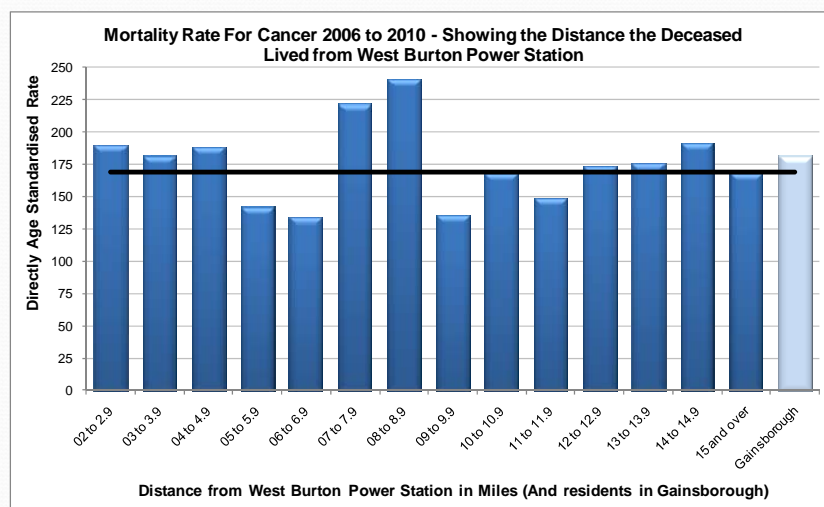
- NHS Lincolnshire conducted a spatial analysis on West Burton PS vs. a vs. cancer mortality e.g.



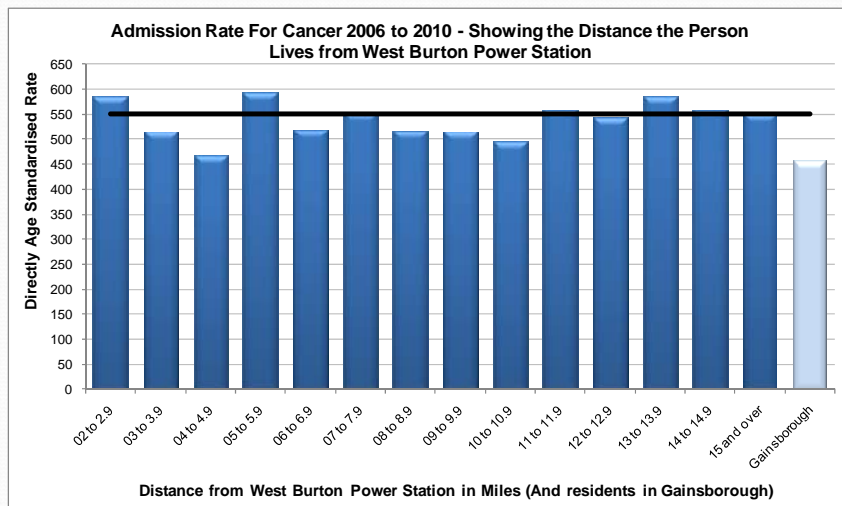
With an environmental point source exposure we would expect to see the following pattern of disease (more or less!)



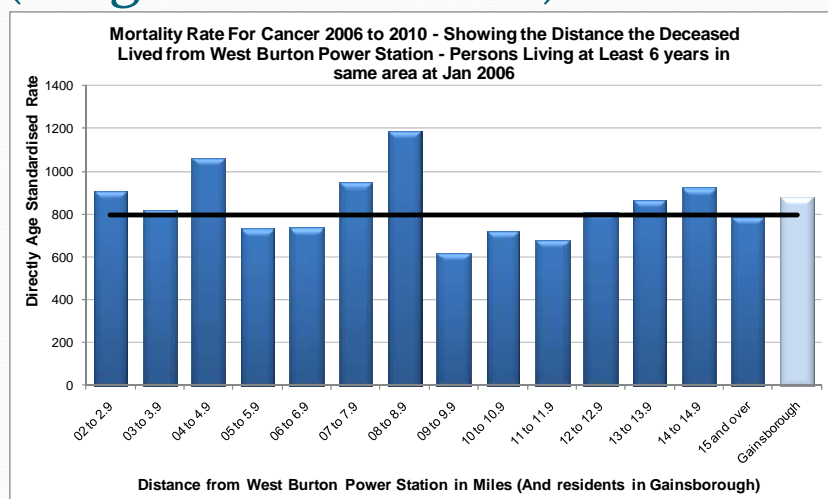
Cancer Mortality spatial analysis results



Cancer Mortality Spatial Results (cancer admissions)



Cancer Mortality Spatial Results (long term residents)



Cancer Rates by Type in West Lindsey

Working hypothesis to be investigated:

1. Radiation can cause cancer ↓
2. A putative exposure route from 'radioactive' PFA in the environment would be via inhalation or ingestion (through contaminated foodstuffs etc) ↓
3. Ergo, logically, we should be seeing higher rates of respiratory & gastrointestinal tract (GI) cancers e.g. lung, oesophageal, stomach & colorectal

Cancer Rates by Type in West Lindsey (cont)

- The Trent Cancer Registry for the East Midlands conducted cancer rate research (2004 -2008) for these and all cancer rates in West Lindsey vs. a vs. a comparator population. They found:
- All cancers - Not statistically different from Lincolnshire PCT for males and females
- Lung cancer – Statistically lower than the England & East Midlands average for males & females
- Oesophageal, Stomach & Colorectal cancer – Rates in West Lindsey are not statistically significantly different from Lincolnshire, East Midlands or England for either males or females.

Final Conclusions

- West Burton is operating well inside legal EA set regulations for particle emissions
- Expert testimony from a variety of independent experts (including the regulator) strongly refute a health problem from PFA
- The NRPB seminal study suggests yearly exposure to natural PFA radiation is 'trivial' and miniscule compared to average annual exposure (e.g. from the sun)
- There is no spatial link present in cancer mortality, cancer admissions (inc long term residents) in the area.
- There is no increased cancer rates in the area from hypothetically 'linked' cancers

Final Conclusions

- No link has been found between cancer rates and PFA
- Recommendation:
T&F Group dissolved following report to Prosperous Communities Committee

Air Quality Management in West Lindsey

Chris Allen
Public Protection Services Manager &
Area Manager for Wider Gainsborough



Regulatory Regime

- Part IV of the Environment Act 1995 places a duty on local authorities to review and assess the air quality within their area
- Assessment required of 7 pollutants against health based objectives - benzene, 1,3-butadiene, carbon monoxide, lead, particulates (PM₁₀), nitrogen dioxide and sulphur dioxide.
- Prescriptive technical guidance dictates how and when we do this.
- Bureau Veritas are commissioned by WLDC to undertake the assessments required by statute and reports are submitted to DEFRA for approval – available on our website.



Assessing air quality

- Monitoring or modelling?
- Nitrogen dioxide monitored by diffusion tubes at 11 sites around the District.
- The diffusion tubes are prepared and analysed by ESG limited to national, accredited standards.
- Results demonstrate compliance with the annual mean objective for nitrogen dioxide was achieved at all monitoring locations in 2010.
- This has been the case since the first Air Quality assessment was undertaken approx 12 years ago.



EDF Energy Monitoring

- EDF Energy have an automatic (continuous) monitoring device situated at Gainsborough Cemetery. This station monitors NO_x , NO_2 and SO_2 .
- AQM Services undertake the data management of the monitoring station to accredited, national standards.
- Results for 2010 show that the pollutants measured continue to meet both the annual mean and short term AQ objectives.
- Monitoring has been undertaken at the cemetery since 2001 and their data informs our AQ reports.



Conclusion

- Our local air quality management report for 2010 shows that air quality objectives for all pollutants was met.
- This has been the case since the first Air Quality Assessment was required.
- WLDC has never been obliged to declare an Air Quality Management Area or undertake more detailed monitoring or assessments.
- All our air quality reports have been submitted to DEFRA and approved by them as acceptable.

