Scope Statement

A study of health in the vicinity of large scale waste incinerators in the U.K. taking into account distance, orientation & confounding factors, and comparison with health in areas without such incinerators.

Sponsored by:

HAGATI (Halton Action Group Against The Incinerators)

To be undertaken by:

Professor Peter Diggle, Lancaster University

The scope statement is an agreement among the project team, the project sponsor and key stakeholders. It represents a common understanding of the project for the purpose of facilitating communication among the stakeholders and for setting authorities and limits for the project manager and team. The scope statement includes relating the project to business objectives, and defining the boundaries of the project in multiple dimensions including approach, deliverables, milestones, and budget.

Table of Contents

A. Executive Summary

Public perception is that there will be adverse health effects from the proposed large incinerator to be built by Ineos Chlor in Runcorn, Cheshire and similar existing and proposed Incinerators. There are no independent studies acceptable to Runcorn residents which demonstrate that such Incinerators will have no adverse health effects but regulatory authorities have deemed such Incinerators have no significant health effects despite acknowledging that there are some indications of adverse effects.

This scope statement describes a study to be undertaken by Professor Peter Diggle which will examine the health of residents living in the vicinity of existing large U.K. Incinerators to identify, and quantify, any adverse health effects which may exist in these areas compared to areas without large scale Incinerators. It will also compare health of residents living upwind and downwind of large Incinerators as there is a perception that harm is more likely to be inflicted on residents living downwind. This will inform residents and regulatory authorities so that concerns are either dismissed or justified.

No regulatory authorities have commissioned or funded a report such as this and so the study is to be commissioned by HAGATI on behalf of affected residents and will be funded independently. However, both the Health Protection Agency (HPA) , together with Halton & St Helens Primary Care Trust (Halton PCT) have provided assistance in preparing this document.

B. Objectives

1. Objectives

Over a 3 year period HAGATI have investigated and reviewed information submitted in support of Incinerator Planning and Environmental permit applications. This has identified a number of obvious errors, omissions, and misstatements made by applicants and their advisers. Further research indicated that regulatory authorities did not have the resources or mandate to validate all aspects of submissions but referred to a great extent to existing policies & conceptions. For example the Health Protection Agency (HPA) published policy is:

"The Health Protection Agency has reviewed research undertaken to examine the suggested links between emissions from municipal waste incinerators and effects on health. While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable. This view is based on detailed assessments of the effects of air pollutants on health and on the fact that modern and well managed municipal waste incinerators make only a very small contribution to local concentrations of air pollutants. The Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment has reviewed recent data and has concluded that there is no need to change its previous advice, namely that any potential risk of cancer due to residency near to municipal waste incinerators is exceedingly low and probably not measurable by the most modern techniques. Since any possible health effects are likely to be very small, if

detectable, studies of public health around modern, well managed municipal waste incinerators are not recommended."

[Source: http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1251473372218]

It should be noted that the HPA have confirmed that the proposed study does not conflict with the last sentence in above policy as it will cover 7 of the existing large waste Incinerators in the UK capable of burning between 200,000 & 750,000 tpa of waste and will consider a wider range of health effects other than just cancer. This will provide sufficient data to provide meaningful results.

The HPA policy was renewed in 2009 but dates from 2005 & the studies reviewed were from periods such as 1974 -1987 (The Small Area Health Statistics Unit (SAHSU) relating only to cancer from what were then small local authority Incinerators. & Elliott *et al* (1996) (again covering cancer only)

Note that organisations consulted in the application process, such as Local authorities and PCTs, rely significantly on advice from the HPA. Such referrals are answered with the policy statement above. Thus what appears to be multiple opinions on health risk by several organisations is in fact from one agency, namely the HPA.

Public perception of Health risks has not been adequately addressed and whether or not there is a health risk, the perception of risk itself is a valid reason for the proposed study as stress created by such a perception is, as acknowledged by the HPA itself, harmful to the public.

- The magnitude of the issue addressed by the study is significant and increasing. Waste Incineration is considered to be a solution to the major problem of diminishing landfill capacity in the UK. 12 large (150k to 750k tpa) Incinerators already exist, 2 more (In Cheshire) have planning permission and it's believed there are around 59 other proposals in progress for England
- The study is constrained by lack of public funding and can only be undertaken within the limits of funding available. There will no doubt be areas where further study will be advisable. However, relatively modest funding will produce results which will satisfy the academic and technical requirements of regulatory agencies and the clarity required by the public.
- A suggestion has been made that a study which covered all EU sites rather than just U.K. sites would be more beneficial. However, as U.K. agencies have failed to commission or fund even a U.K. study or investigate the concerns raised in the few reports that do exist it seems unlikely that such a study would ever be undertaken – unless perhaps the study proposed here produced evidence that unacceptable health risks do exist.
- If the study proposed here does not take place then in view of the increasing number of Incinerators in the U.K. there will be an increasing number of people stressed by concerns

over the health effects and maybe increasing harm done. There will also be repeated conflict between operators & residents throughout the U.K. As the number of Incinerators increases and the U.K. becomes more dependent on waste Incineration then any health effects which do become apparent will be increasingly difficult to mitigate.

- The study will utilize the considerable resources and ability of a team led by Professor Diggle within Lancaster University. Data will be extracted from existing National statistics and analysed using techniques already developed by Professor Diggle. No external costs will be incurred and costs will be exclusively that of suitably qualified and trained individuals working part time over a period of 3 to 6 months.
- The ultimate objectives of the study are:

1. To establish and quantify if there is any adverse effect on health in areas with large scale Incineration compared to areas without large scale Incineration.

2. To establish and quantify if there is a varying effect on health between orientation and distance in areas with large scale Incinerators.

This will either:

a) Inform the general public whether they may be exposed to a health risk from large waste Incinerators

b) Inform Government agencies on any Health risks posed by large scale waste Incinerators so that decisions on restricting, permitting, financing, promoting, and monitoring such Incinerators can be made accordingly.

c) Indicate whether alternatives to large scale waste incineration should be prioritized to address the issue of diminishing landfill capacity.

Or,

d) Address the general public's perception that there is a health risk in vicinity of Incinerators & provide them with re-assurance.

e) Reduce the stress of living near to existing or proposed Incinerators

f) Remove a major element of conflict between the general public, regulatory agencies, and Incinerator operators.

C. Project Description

1. Methodology

As described in Appendix A (prepared by Professor Diggle)

2. Does not include:

a) Health effects known to be caused by factors other than Incinerator operation and known not to be affected in any way by Incinerator operation.

b) Health effects where no, or insufficient, reliable data is available to the study team.

3 Completion Criteria

i) A non technical summary of the study which includes:

a) Sponsors / Funders
b) Study team
c) Objectives
d) Incinerator sites studied and why chosen
e) Non Incinerator sites studied and why chosen
f) Health Parameters included
g) Sources and type of Data used
h) Exclusions & reason for exclusion
i) Methodology used and reason
j) An overall summary of results
k) Tabular & Graphical representation of results
l) A summary of conclusion
m) Any recommendations
l) Any unavoidable omissions / constraints

ii) Provision to Project Sponsor of all raw data extracted from publicly available sources in Excel format

iii) A technical document in a form suitable for publication by a peer reviewed Scientific Journal

iv) Publication of the technical document by Lancaster University

v) Submission of the technical document for publication in appropriate peer reviewed Scientific Journals

4. Constraints

Lack of or inadequate funding .
Availability of Peter Diggle
Availability of Data

5. Measures of Project Success

Acceptance for publication by a peer reviewed Scientific Journal
Clear conclusions understandable by Sponsors

6. Assumptions

HAGATI will support by providing any relevant information it has accumulated
HPA will assist by providing any relevant information they have available or can access.

D. Project Approach

Planned Approach

1.Discussion between HAGATI, HPA to identify & confirm need (completed Nov 09)
2.Discussion between HAGATI, HPA, and Peter Diggle to consider if & how need can be met at what approximate cost, and whether study is viable (Jan 10)
3. HAGATI, HPA to discuss with PCT to confirm need & indicate parameters (completed 16/610)
4. HAGATI to prepare draft scope statement together with basic data (completed 4/8/10)
5. HAGATI to discuss Scope statement with HPA (9/8/10:agreement pending)
6. HAGATI to discuss amended draft scope statement with Peter Diggle & amend as necessary (Completed & agreed 20/8/10)
7. HPA & HAGATI to verify availability of appropriate ONS Data (by 16/8/10)
8. HAGATI, Peter Diggle, and HPA, to agree final scope statement.
9. Peter Diggle to provide Formal quote, Project Milestones and payment staging required.
10. HAGATI & HPA to discuss & agree scope statement with Halton & St Helens PCT (Fiona Johnstone)
11. HAGATI to obtain Funding & formally commission Peter Diggle
12. Peter Diggle to confirm timescales & commence Project
13. HAGATI to make payments according to staging agreed.
14. Peter Diggle to provide HAGATI with completed study documentation
15. Peter Diggle to arrange publication by Lancaster University.
16. Peter Diggle to submit study for publication in appropriate Scientific Journal.
17. HAGATI to act as repository for all publicly available data obtained together with study documentation and distribute, as considered appropriate, to interested parties.

E. Project Estimates

1. Estimated Schedule

Key Project milestones relative to project start are as follows:

Project Milestones	Target Date
Project Start TBA & subject to Funding but team will be available on part time basis from 6/9/10	MM/DD/YY

F. Project Controls

Project controls are Steering Committee Meetings, Monthly Status Reports, Risk Management assessment and mitigation planning and monitoring, Issue Management, Change Management, and Communication Management.

1. **Steering Committee Meetings**
   Will be held at least monthly to address any issues arising, to monitor progress, and to review monthly status reports.

2. **Monthly Status Reports**
   The Project manager will provide monthly status reports to the project owner

3. **Risk Management**
   The programme manager will ensure the project risks and associated mitigation actions are monitored and controlled

4. **Issue Management**
   Project-related issues will be tracked, prioritized, assigned, resolved, and communicated in accordance with the Project Management Procedures:

   Issue descriptions, owners, resolution and status will be recorded & maintained in a standard format.

   Issues will be addressed with the Project Owner and communicated in the project status report and, if urgent, communicated by e-mail.

5. **Change Management**
   The change control procedures to be followed will be consistent with Project Management Procedures and consist of the following processes:

   A Change Control record will be established by the project manager to track all changes associated with the project effort.

   All Change Requests will be assessed to determine possible alternatives and costs.

   Change Requests will be reviewed and approved by the project owner.

   The effects of approved Change Requests on the scope and schedule of the project will be reflected in updates to the project plan.

   .

6. **Communication Management**

The following strategies have been established to promote effective communication within and about this project:

The Project Manager presents the project status to the Project Owner on a monthly basis; however, ad hoc meetings will be established at the Project Manager's discretion as issues or change control items arise. The Project Manager provides a written status report to the Project Owner on a monthly basis and distributes the project team meeting minutes. The Project Owner will be notified via email on all urgent issues. Issue notification will include time constraints, and impacts, which will identify the urgency of the request for service.

The project team will have weekly update/status meetings to review completed tasks and determine current work priorities. Minutes will be produced from all meetings.

The Project Owner will provide the project sponsors with project team minutes and steering committee status reports.

On completion of the study interested parties will be provided with access to the study report

G. Roles

The following role definitions are being applied to the resources assigned to this project:

Project Sponsor	Provides executive team approval and sponsorship for the project. Has budget ownership for the project and is the major stakeholder and recipient for the project deliverables.
Project Owner	Provides policy definition to the Project team. Resolves all policy issues with the appropriate policy owners in order to provide a clear, decisive definition. Makes final decisions and resolves conflicts or issues regarding project expectations across organizational and functional areas. The project owner and the project manager have a direct link for all communication. The project manager will work directly with the project owner on all policy clarification.
Project Manager	Provides overall management to the project. Accountable for establishing Project Methodology, developing and managing the work plan, securing appropriate resources and delegating the work and ensuring successful completion of the project. All project team members report to the project manager. Handles all project administrative duties, interfaces to project sponsors and owners and has overall accountability for the project including preparing reports including conclusions & recommendations.
Steering Committee	Provide assistance in resolving issues that arise beyond the project manager's jurisdiction. Monitor project progress and provide necessary tools and support when milestones are in jeopardy.
Stakeholder	Key provider of requirements and recipient of project deliverable and associated benefits. Deliverables will directly enhance the stakeholders' interests. Stakeholders for this project will be senior management of their organisation
Team Member	Working project team member who collects, collates, tabulates and (if necessary) converts data, and prepares in a form suitable for analysis. Assists the Project Manager in applying statistical techniques, and, after review by Programme Manager, formats the resulting analysis in a form suitable for distribution. This includes collaborating with team members to develop high level process designs and models, understanding best practices and partnering with team members to identify deficiencies, and appropriate opportunities, challenging existing practices and stimulating creating thinking..

H. Stakeholders

.

Name	Role
HAGATI	Project Sponsor
Alan Gorry	Project Owner
Peter Diggle	Project Manager
Jeff Meehan	Steering Committee Chairman
Simon La Frenais	Steering Committee Member
John Dearden	Steering Committee Member
Mike Stackpool	Steering Committee Member

I. Timescales

Project Completion estimate: Expected 3 months & no later than 6 months from Commissioning	

J. Resource Requirements – Team and Support Resources

The following personnel resources are required to complete this project:

Personnel Resource Types	Quantity
TBA by Programme Manager	
Total Personnel Resources	

resource assumptions:

K. Estimated Costs

Expense	Original Budget	Current Budget	Spent to Date	Est. to Complete	Current Forecast	Variance
Labour	10,000	11,000	0	11,000	11,000	0
Internal						
External						
Hardware						
Software						
Other						
Total	10,000	11,000	0	11,000	11,000	0

Budget assumptions:

All required data is sourced at no external cost.

L. Checkpoint/ Funding Schedule

Funding will provided no later than 30 days after provision of study documentation or otherwise in stages as agreed between Project Owner and Project Manager.

M. Authorizations

This section sets out who has authority to approve scope statement, authorize project changes, approve and accept project deliverables.

The Scope Statement will be approved by:

The Project Manager

The Project Owner

The Project Sponsor

Project Changes will be approved by:

The Project Owner

Project milestone completion will be approved / accepted by

The Project Owner

The Project Sponsor

The key Stakeholders

Project completion will be approved/accepted by:

The Project Owner

The Project Sponsor

.

N. Scope Statement Approval Form/Signatures

Scope Statement Approval Form

Project Name: Incinerator Health Study

Project Manager: Peter Diggle

The purpose of this document is to provide a vehicle for documenting the initial planning efforts for the project. It is used to reach a satisfactory level of mutual agreement between the project manager and the project sponsors on the objectives and scope of the project before significant resources are committed and expenses incurred.

I have reviewed the information contained in this Scope Statement and agree.

Name	Signature	Date
Peter Diggle		
Alan Gorry		
Jeff Meehan		

The signatures of the people above relay an understanding in the purpose and content of this document by those signing it. By signing this document you agree to this as the formal Project Scope Statement.

Appendix A: Methodology

The study will include all incinerators with capacity in excess of 150,000tpa of waste material that were operational on or before 31/12/1998 and continued in operation for a period of 5 or more years subsequently. The study team has identified 7 such incinerators:

	Site ID	Postcode	Capacity (TPA)	Long	Lat	Local Authority
1	Edmonton	N183AG	750,000	-0.04040	51.61626	Enfield
2	Lewisham	SE145RS	488,000	-0.04609	51.48553	Lewisham
3	Tyseley, Birmingham	B112BA	400,000	-1.83995	52.46100	Birmingham
4	Coventry	CV34AN	315,000	-1.49146	53.39624	Coventry
5	Eastcroft, Nottingham	NG23JH	260,000	-1.13532	52.94636	Nottingham
6	Billingham	TS231PY	250,000	-1.25918	54.59466	Stockton-on-Tees
7	Stoke	ST44DX	210,000	-2.18675	52.99166	Stoke-on-Trent

Around each incinerator, a case-region will be defined as the set of all LSOA's [or Wards if LSOA data are not available] that are wholly or partially contained in a circular area centred on the incinerator location, and of radius 10km
Each case-region will be paired with a control-region, defined as a circular area of radius 10km with total population within +/-50% of the total population of its matched case region, and with no incinerator of capacity more than 50,000 tpa either within the circle or within 10km of its boundary.
Within each LSOA in each case or control region, data on potential risk-factors and selected health outcomes will be extracted from available sources as follows.

1. Population count
2. Deprivation, as measured by each domain of the Index of Multiple Deprivation
3. Dominant land-use classification (urban/rural)
4. Annual incidence of each of the following health outcomes, 1998 – 2008 inclusive.
   a) Infant mortality (up to 1 year of age)
   b) Terminations due to foetal anomalies
   c) Childhood cancers
   d) COPD morbidity/mortality
   e) All-cause mortality
   f) Soft-tissue sarcomas
5. Average birth-weight

Items 1 and 2 will be extracted by Lancaster University from the 2001 census, item 3 will be extracted by Lancaster University from existing ONS data, items 4 and 5 will be extracted by HPA from existing ONS, PCT or Health Observatory data.
Two statistical analyses will be performed, as follows:

1. Time-trends in annual health outcome data at the whole-circle level will be analysed using a Poisson log-linear model for incidence outcomes and a Gaussian linear model for average birth weight. The analysis of each health outcome will treat matched pairs as a factor and average deprivation score as a measured covariate, both potentially interacting with time-trend. This analysis will investigate whether whole area time-trends in health outcomes differ over the ten-year follow-up period between case and control areas.

2. Spatial trends in health outcomes within each circle will be analysed using the point-source methodology described in Diggle et al (1997) adapted to allow for directional effects using the model described in Dunn et al (2006). The analysis of each outcome will treat urban/rural classification of each LSOA as a factor and deprivation as a measured covariate This analysis will investigate whether there is an association between incidence and proximity(distance and orientation) to an incinerator

The results of the analyses will be written up and submitted for publication in a peer-reviewed journal.

Diggle, P. Elliott, P., Morris, S. and Shaddick, G. (1997). Regression modelling of disease risk in relation to point sources. *Journal of the Royal Statistical Society*, A **160**, 491-505.
Dunn, C.E., Bhopal, R.S., Cockings, S., Walker, D., Rowlingson, B. and Diggle, P. (2006). Advancing insights into environment-health relationships: a multidisciplinary approach to understanding Legionnaires' disease. *Health and Place*, **13**, 677-690.

Peter J Diggle, 19 August 2010
Distinguished University Professor
School of Health and Medicine
Lancaster University
Lancaster, UK
Phone: +44 1524 593957

Adjunct Professor
Johns Hopkins University School of Public Health
Baltimore, USA

Adjunct Senior Research Scientist,
International Research Institute for Climate and Society,
Columbia University, New York, USA