Gravesham Borough Council

Local Air Quality Management – Final Action Plan

July 2004

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1 EXECUTIVE SUMMARY

The Air Quality Final Action Plan is the culmination of the first round of local air quality review and assessment for Gravesham Borough Council (GBC). In response to European Directives on Air Quality and for the purposes of Local Air Quality Management (LAQM) the government has set down the process of review and assessment in Part IV of the Environment Act 1995 and regulations made thereunder.

The Council has gone through the process of LAQM with the first round indicating exceedences of the 2005 Nitrogen dioxide objectives and the 2004 Particulate matter (PM_{10}) objectives as set out in the Air Quality Regulations 2000 (amended 2002). These were predicted at relevant receptors bordering the A2 corridor through the Borough and exceedences of the 2004 PM_{10} objective were predicted within the Northfleet Industrial Area. This resulted in the declaration of two Air Quality Management Areas (AQMAs):

- The 'A2 Trunk Road AQMA' for Nitrogen dioxide and PM_{10} largely due to road traffic emissions from the A2.

- The 'Northfleet Industrial Area AQMA' for PM_{10} largely due to 'fugitive' (uncontrolled) emissions from industrial processes in and surrounding the area

In compiling this Final Action Plan, Government guidance LAQM.PG (03) and guidance from the National Society for Clean Air has been referred to, alongside guidance provided by the Department for Environment, Food and Rural Affairs through its Air Quality Action Plan Help Desk.

The aim of the Final Action Plan is to identify how Gravesham Borough Council will use its existing powers and work together with other organisations in pursuit of the annual air quality objectives for Nitrogen dioxide and PM_{10}. Measures are proposed to improve air quality both within the two AQMAs and across the Borough as a whole.

The Highways Agency is responsible for the management of the A2, a strategic trunk road of national and international importance. As such, it is responsible for any direct action proposed for this AQMA in order to reduce road traffic emissions. Gravesham Borough Council will work together with Kent County Council (KCC), the local transport authority, and the Highways Agency to improve air quality within the AQMA along the A2 Trunk Road corridor and throughout the Borough.

The Environment Agency is responsible for the permitting and regulation of the largest (A1) industrial processes, such as Lafarge Cement UK, which is a major contributor to 'fugitive' PM_{10} emissions in the area. Gravesham Borough Council permits and regulates the smaller prescribed (Part B) processes and has powers through planning and statutory nuisance legislation to minimise emissions from other processes. Gravesham Borough Council will work together with the Environment Agency to improve air quality within the Northfleet Industrial Area AQMA.

The Council has considered all options available to improve or manage the Air Quality within the two AQMAs. All of these options are listed in section 7. An extensive consultation exercise was entered into, the details of which are included in section 3. The findings of this exercise have assisted in the decision making process as to which of the direct actions and indirect measures considered as options were taken forward to the Final Action Plan. The

additional indirect measures proposed in the draft Action Plan were put out to statutory consultation only in order to avoid a complicated and lengthy public consultation document.

Together with a consideration of who the responsible party is, cost, feasibility and non-air quality benefits the Council have been able to define five direct actions for the A2 Trunk Road AQMA, four direct actions for the Northfleet Industrial AQMA and 19 additional indirect measures to improve air quality across the borough.

In summary the direct actions considered as options for the A2 Trunk Road AQMA follow. Those actions to be taken forward in this Final Action Plan are indicated, the other options have been discounted for reasons explained in section 7:

Table 1 – Options to be taken forward for A2 Trunk Road AQMA following consultation process

Action	Description	To be taken forward
Option 1	Speed regulation	Yes
Option 2	Compulsory purchase of properties	No
Option 3	Reduction in traffic flows on the A2 Trunk Road	Yes
Option 4	Reduction in numbers of Heavy Goods Vehicles on the A2	Yes
Option 5	Reduction in overall background levels	Yes
Option 6	Introduction of tolls	No
Option 7	Realignment and widening of the A2	Yes

Table 2 – Options to be taken forward for Northfleet Industrial AQMA following consultation process

Action	Description	To be taken forward
Option 1	Measures to minimise releases at Northfleet Cement Works	Yes
Option 2	Relocation of the Northfleet Cement Works	Yes
Option 3	Reduction in Particulate emissions from the combined impact of industrial processes in Northfleet	Yes
Option 4	Compulsory purchase of properties	No
Option 5	Additional Street Cleaning Measures	Yes

The indirect measures proposed to improve air quality across the whole Borough were as follows. All are to be taken forward following the consultation process including one new indirect measure relating to the planting of trees which benefit air quality as suggested by several statutory consultees.

Measure 1: GBC will work together with the Highways Agency on the consideration of direct options for the A2 Trunk Road

Measure 2: GBC will continue to work closely with Lafarge Cement UK and the Environment Agency to secure the necessary improvements at the Northfleet Works.

Measure 3: GBC will continue to work closely with Lafarge Cement UK and the Environment Agency on the relocation timetable.

Measure 4: GBC will work in Partnership with local industries in the Northfleet Area to secure improvements in air quality

Measure 5: GBC will ensure that the Final Action Plan measures are co-ordinated with relevant Local Transport Plan (LTP) measures and provide KCC with annual progress reports on air quality.

Measure 6: GBC will work together with KCC to improve public transport facilities within Gravesham and develop quality partnerships with transport providers to promote greater uptake of public transport.

Measure 7: GBC will review the Council's Green Travel Plan, implement the measures and encourage uptake of sustainable modes of transport

Measure 8: GBC will continue to work together with KCC and Groundwork Kent Thameside to encourage the uptake of Employer and School Travel Plans within Gravesham.

Measure 9: GBC will work together with KCC to improve the facilities for cycling and walking within Gravesham and encourage greater uptake.

Measure 10: GBC will work together with KCC to develop Freight quality partnerships and encourage wider uptake of freight by rail.

Measure 11: GBC Environmental and Public Health Services will continue to work closely with the Planning and Regeneration Services Department to ensure that air quality is taken into account in the planning process when located in or close to the AQMA or in areas marginally below air quality objectives.

Measure 12: GBC will continue to work together with developers to improve sustainable transport links serving new developments.

Measure 13: GBC will develop, through the Kent and Medway Air Quality Partnership, a supplementary planning document to assist with air quality assessments of development proposals

Measure 14: GBC will consider the development of a local air quality strategy to provide a framework for ensuring long-term commitment and support for air quality issues.

Measure 15: GBC will continue their commitment to local air quality monitoring within the Borough to ensure a high standard of data is achieved to assess against air quality objectives

Measure 16: GBC will make details of the Final Action Plan measures and annual progress reports available on the Website to ensure broad access to the consultation and implementation process.

Measure 17: GBC will continue to work together with KCC and the Kent and Medway Air Quality Partnership on promotional activities to raise the profile of air quality in Gravesham

Measure 18: GBC will continue to work together with the Kent Energy Centre to promote and implement energy efficiency measures in Gravesham

Additional indirect measures as a result of the consultation process:

Measure 19: GBC will encourage the planting of trees which benefit air quality within the borough through the planning process, Gravesham's Open Space Strategy and green initiative partnerships.

Measure 20: GBC will provide advice and pursue an advocacy role to assist in minimising the effects of poor air quality in public buildings.

Time-scales
Time-scales for the actions range from the short term (achievable by 2005) to the longer term (not achievable before 2010). Funding will be achieved through the LTP bids for proposed local transport measures and the Highways Agency and Central Government for proposed direct measures for the A2 Trunk Road AQMA. Funding will be achieved through industrial process operators, GBC and the Environment Agency for proposed direct measures for the Northfleet Industrial Area AQMA.

The PM_{10} and NO_2 objectives (2004/2005) are unlikely to be met without immediate intervention by the Highways Agency through direct measures for the A2 Trunk Road AQMA and the major industrial operators for the Northfleet Industrial Area AQMA. It should be noted that while GBC can implement a number of measures in the short term which will lead to air quality improvements, the present proposals by the Highways Agency, for realignment of the A2 Trunk Road, and industrial process operators (notably Lafarge Cement UK) for the Northfleet Industrial AQMA are longer-term goals (~2008) and will not achieve the objectives. As such, without additional measures, the achievement of the objectives will be a long-term goal of the Council for which annual updates will be provided through progress reports. The objectives will not be achieved solely by the implementation of local indirect measures to improve air quality in the Borough.

2 INTRODUCTION AND AIMS OF THE FINAL ACTION PLAN

2.1 Project Background

Gravesham Borough Council has drawn up, with the assistance of both the University of the West of England and Casella Stanger, a Local Air Quality Management Action Plan for the two Air Quality Management Areas within GBC. The Final Action Plan is required to be undertaken as part of the local authority's statutory duties as defined within Part IV of the Environment Act, 1995.

Casella Stanger has undertaken previous review and assessment reports for GBC, which includes the Stage 4[1] assessment. The results of the Stage 4 supported the continuance of the two Air Quality Management Areas (AQMAs): The 'A2 Trunk Road AQMA' for Nitrogen dioxide and PM_{10} and the 'Northfleet Industrial Area AQMA' for PM_{10}.

2.2 Legislative Background

Part IV of the Environment Act, 1995, places a statutory duty on local authorities to periodically review and assess the air quality within their area. This involves consideration of present and likely future air quality against air quality standards and objectives. Guidelines for the 'Review and Assessment' of local air quality were published in the 1997 National Air Quality Strategy (NAQS)[2] and associated guidance and technical guidance. In 2000, Government reviewed the NAQS and set down a revised Air Quality Strategy for England, Scotland, Wales and Northern Ireland[3] (AQS). This set down a revised framework for air quality standards and objectives for seven pollutants, which were subsequently set in Regulation in 2000 through the Air Quality Regulations 2000[4]. These were subsequently amended in 2002[5].

Where it appears that the air quality objectives will not be met by the designated target dates local authorities must declare an Air Quality Management Area (AQMA) and develop action plans in pursuit of the air quality objectives. Following the Stage 4 Assessment results, GBC are required to develop an Action Plan for the two AQMAs in the Borough.

Policy Guidance LAQM.PG(03) was published by the Government in 2003, which included guidance on the development of action plans. The NSCA have published guidance 'Air Quality Action Plans (2000)' and 'Air Quality: Planning for Action (2001)'. These guidance documents have been taken into account in development of the Final Action Plan for GBC, alongside guidance provided by the Department for Environment, Food and Rural Affairs through its Air Quality Action Plan Help Desk which provides examples of best practice and an Action Plan appraisal checklist.

2.3 Scope of the Final Action Plan

The purpose of the Final Action Plan is to provide the means through which a local authority through joint working with the County Council, national agencies and other relevant organisations delivers viable measures that will work towards achieving the air quality objectives within an AQMA. The aim is also to encourage active participation in the

[1] Stage 4 Air Quality Review and Assessment - Gravesham Borough Council, August 2002
[2] DoE (1997) The United Kingdom Nation Air Quality Strategy The Stationery Office
[3] DETR (2000) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland – Working together for Clean Air, The Stationery Office
[4] DETR (2000) The Air Quality Regulations 2000, The Stationery Office
[5] Defra (2002) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland: Addendum, The Stationery Office

achievement of action plan measures by consulting the local community and raising awareness of air pollution issues.

Local authorities are required to prepare a written Action Plan for an AQMA, setting out the action plan measures they intend to take forward and the potential costs and benefits of these measures. The Stage 4 Air Quality Review and Assessment provides the technical backup for the measures to be included in the Action Plan. The Action Plan should refer to the findings of the Stage 4 in terms of source apportionment (i.e. where emissions are coming from) so that action plan measures are targeted appropriately.

The Action Plan should contain simple estimates of the costs and benefits and time-scales for implementing the proposed action plan measures, so that measures can be prioritised for implementation and subsequently monitored.

2.4 Reporting of Action Plan

The A2 Trunk Road AQMA has been declared due to road traffic emissions. The A2 trunk road is of national importance, being the strategic link to the ports of Dover and Folkestone. The Highways Agency (HA) is the relevant transport authority for this trunk road and therefore has the responsibility for any actions proposed for the A2. Kent County Council (KCC) is the relevant transport authority for roads on the local network and will work jointly with GBC on transport measures within the Borough.

The Northfleet Industrial Area AQMA has been declared due to 'fugitive' dust (PM_{10}) emissions from industrial processes. The Environment Agency and GBC have been identified as the authorities responsible for actions proposed to reduce 'fugitive' PM_{10} emissions in the area.

The Action Plan reflects these differing organisational responsibilities for actions within the AQMA and proposed measures (Section 7) are reported as:

- Direct actions proposed for the A2 Trunk Road (responsibility of the Highways Agency);
- Direct actions proposed for the Northfleet Industrial Area (responsibility of the Environment Agency and of GBC)
- Indirect actions Borough-wide to improve air quality throughout the Gravesham area, including the AQMA (responsibility of GBC and KCC)

3 CONSULTATION

In considering which direct actions and additional measures to propose for improvements in air quality within the two AQMAs and across the Borough, GBC set up an Air Quality Working Group in June 2003. Cross-Council departments have attended this group (covering Environmental and Public Health, Planning, Engineers and the Lead Member for Environment, Community Health and Public Spaces.) In addition, the Highways Agency (with their consultants Hyder), the Environment Agency, Primary Care Trust, local businesses (Lafarge Cement UK, Foster Yeoman, RMC Limited and Kimberly Clarke), Groundwork Trust and Friends of the Earth also participate.

With the assistance of the Air Quality Management Resource Centre (University of the West of England), the group discussed the appropriate direct actions and indirect measures for consideration within the Action Plan, which are reported in the following section.

Under Schedule 11 of the Act, Local Authorities are required to consult on their draft LAQM Action Plan. It is important for the success of the Action Plan to have involvement by all local stakeholders including local residents, community groups and local businesses in the drawing up the Action Plan in addition to their active participation in achieving the action plan measures. The following is a list of statutory and non-statutory consultees to which this draft Plan was sent.

All comments from both Statutory and non-statutory consultees received on the draft Action Plan were considered and incorporated where possible into the Final Action Plan**.** The timescale for consultation was a period of 15 weeks for the statutory and non-statutory consultees with the public being involved in the latter 8 weeks of the period.

3.1 Consultees for the draft Air Quality Action Plan

General Public

By the following methods
Mail-shot of those properties within the AQMAs and within relevant buffer zones (50m for the A2 AQMA and approx. 400m for Northfleet Industrial Area AQMA)
Press release to local newspaper and
Air Quality Action Plan display in Civic Centre foyer.

Secretary of State for Environment, Food and Rural Affairs
The Highways Agency and their consultants for A2 realignment project
The Environment Agency
Kent County Council – Strategic Planning Directorate
Dartford Borough Council
Medway Council
Sevenoaks Borough Council
Tonbridge and Malling Borough Council
Thurrock Council
Consultant for Public Health - Dartford, Gravesham and Swanley PCT
Gravesham Borough Council – Executive Director of Community Services
Gravesham Borough Council – Executive Director of Corporate Services
Gravesham Borough Council – Director Gravesham Services
Gravesham Borough Council – Planning and Regeneration Services

Gravesham Borough Council – Building and Town Services
Gravesham Borough Council – Environmental and Public Health Services
Gravesham Borough Council – Housing Services
Gravesham Borough Council – Engineering Services
Gravesham Borough Council – Legal Services
Gravesham Borough Council – Leisure Services
Gravesham Borough Council – Financial Services
Gravesham Borough Council – Corporate Services
Gravesham Borough Council – Democratic Services
Gravesham Borough Council – IT Services
Gravesham Borough Council – Lead Member for Environment, Community Health and Public Space
Groundwork Kent Thameside
Members of Air Quality Working Group

- representatives from above agencies/services,
- Friends of the Earth
- and local Industry e.g. RMC, Lafarge, Britannia

Gravesham's consultant for inspection of Part B processes
Port of London Authority
Dept of Environmental Services, Corporation of London
English Heritage
Kent Energy Centre

4 OVERVIEW OF AIR QUALITY IN GRAVESHAM BOROUGH COUNCIL

The main source of air pollution in GBC is road traffic emissions from major roads, notably the A2 Trunk Road and a number of strategic urban roads through Gravesend town centre. In addition, 'fugitive' dust emissions from industrial processes in the Northfleet Industrial Area have been shown to be a problem in a more localised area. Northfleet Industrial Area has three Part A processes regulated by the Environment Agency: Lafarge Cement UK (formerly Blue Circle Industries), Kimberley Clark and Britannia Refined Metals Ltd. Tilbury Power Station is a Part A process located in neighbouring district Thurrock which contributes to emissions in the Borough. In addition there are 31 Part B processes, most of which are located in the Northfleet area. The larger of these include Foster Yeoman Ltd and CPI Mortars. Other pollution sources, including commercial and domestic sources, will also make a contribution to background pollution concentrations. A summary of the review and assessment process is shown in table 1. The individual stages are summarised briefly with respect to outcome below:

Stage 1

The Stage 1 Air Quality Review and Assessment[6] (1998) recommended further assessment for sulphur dioxide (SO_2), Nitrogen dioxide (NO_2), carbon monoxide (CO) and fine particulates (PM_{10}). In addition, the report highlighted further assessment for benzene and 1,3 - butadiene, although this was due to the lack of monitoring information in the Borough for these two pollutants.

Stage 2

The Stage 2 Review and Assessment[7] concluded that no further assessment was necessary for benzene, CO and 1,3 - butadiene. Further assessment was recommended for NO_2, SO_2 and PM_{10}. The main area of focus for these pollutants being relevant exposure within the Northfleet Industrial Area and, with respect to PM_{10} and NO_2, emissions from road traffic using arterial roads (notably the A2) and the road network within Gravesend town centre. The Stage 2 report concluded that for SO_2, emissions from Part A processes outside the Borough (notably Tilbury Power Station) would also require further assessment.

Stage 3

The Stage 3 Review and Assessment[8] recommended, on the basis of findings of dispersion modelling, that GBC declare an AQMA along the northern edge of the A2 carriageway which included ~784 houses and 1 school. The results of PM_{10} monitoring at the industrial background site in Northfleet showed likely exceedences of the 2004 PM_{10} objectives and recommended declaration of an AQMA within the boundary of the Northfleet Industrial Area. In the response from the Secretary of State, it was highlighted that for SO_2, there was no need to declare an AQMA on the SO_2 objective for emissions related to power stations in light of tighter emission limits to be regulated by the Environment Agency.

[6] Gravesham Borough Council, Managing Air Quality in Gravesham Stage One report, November 1998
[7] Managing Air Quality in Gravesham. Stage 2 Report. Date 1999 Gravesham Borough Council
[8] Stage 3 Local Air Quality Review and Assessment Gravesham Borough Council

Table 1: Summary of review and assessment process for GBC

Source	Stage 1 (1998)		Stage 2 (1999)		Stage 3 (2001)	Stage 4 (2002)
Industrial	Lead				Exceedence of PM_{10} annual mean and 24-hour mean objective in Northfleet resulted in declaration of the Northfleet Industrial Area AQMA. SO_2 not taken forward to AQMA due to tighter emissions limits. Exceedence of 24 hour mean PM_{10} and annual mean NO_2 objectives resulted in declaration of the A2 Trunk Road AQMA due to road traffic emissions.	**Further assessment of PM_{10} and NO_2 in AQMAs.** **Support for continuance of both AQMAs – Action Plan required.**
	Benzene	→	Benzene			
	1,3-Butadiene	→	1,3-Butadiene			
	PM_{10}	→	PM_{10}	→		
	Sulphur dioxide	→	Sulphur dioxide	→		
Road Traffic						
	NO_2	→	NO_2	→		
	PM_{10}	→	PM_{10}	→		
	Carbon monoxide	→	Carbon monoxide			

4.1 Key findings of the Stage 4 Review and Assessment

The results of the detailed work carried out in the Stage 4 assessment have confirmed the findings of the previous Stage 3 report and the Council's decision to declare two AQMAs within the Borough. The key outcomes of the Stage 4 assessment for each of the two AQMAs are provided below:

A2 Trunk Road AQMA
The Stage 4 assessment for the A2 Trunk Road AQMA confirmed road traffic along the A2 as the dominant local source of NOx and PM_{10} emissions in the AQMA. Source apportionment concluded that heavy goods vehicles (HGV) on the A2 are contributing disproportionately to the elevated concentrations of NOx. Therefore, reductions in the number of HGVs would afford the largest improvement in the NOx concentrations. Scenario testing using the new DMRB emission factors toolkit 2002 indicated that a reduction in HGV numbers from 14% to 12% (i.e. ~14% reduction on current levels) would result in the objectives being met. In comparison, a 10.5% reduction in all vehicles (to 100,000 AADT) would be required to meet the annual mean NO_2 objective.

The reduction of NOx required at the nearest receptor to the A2 was calculated as 11.4µg/m^3 (i.e. a 10% improvement). The maximum predicted concentration of NO_2 was 48.5µg/m^3 (i.e. ~20% above the objective). One school and 784 residential receptors were identified as being at risk of exceeding the annual NO_2 objective in 2005.

Results for PM_{10} showed that no exceedences of the annual mean of fixed 24-hour mean objectives would occur as a result of road traffic emissions alone. The Stage 3 assessment showed exceedences of the objectives but was based on previously released emissions factors and was influenced by uncontrolled PM_{10} emissions from the adjacent Channel Tunnel Rail Link works. However, due to the high projected future traffic flows for the A2 and several major infrastructure construction projects being undertaken in the vicinity, it is likely that PM_{10} levels will increase above objective levels and therefore the AQMA for PM_{10} has not been revoked.

Northfleet Industrial Area AQMA
The Stage 4 assessment for Northfleet Industrial Area AQMA confirmed 'fugitive' dust emissions from industry as the dominant local source of PM_{10} emissions in the AQMA. The Stage 4 considered any changes to industrial processes in Gravesham, including the installation of low NOx burners by Tilbury Power Station and the stoppage of operations the W.T.Henley Brass Castings Plant. All the other processes had not introduced any new abatement strategies apart from emphasising the routine maintenance of air pollution control equipment.

For the Northfleet Industrial Area AQMA a less quantitative approach to assessment was made due to the uncertainties surrounding emission rates. Lafarge Cement UK is one of the main processes responsible for 'fugitive' emissions of dust, based on monitoring data from the industrial background site and the 'foot-print' identified for fugitive dust exceedences up to 1000 metres (LAQM.TG4(00)). Since declaration, the Borough Council has liased strongly with all relevant parties to secure improvements in local air quality.

In addition, it is recognised that indirect local measures can make a contribution by reducing background levels and improving air quality throughout the Borough and GBC are committed to the improvement of local air quality. To this aim, GBC has set up an Air Quality Working Group to engage all relevant partners, including KCC, the Environment Agency, the Highways Agency and local businesses.

5 EXISTING POLICIES AND STRATEGIES TO IMPROVE AIR QUALITY

There are a number of related policies and strategies at the local and regional level that can be tied in directly with the aims of the Gravesham Air Quality Action Plan, and will help contribute to overall improvements in air quality across the Borough.

5.1 Gravesham Local Plan 2nd Review – First Deposit Version (May 2000)

It is fundamental to the achievement of the aims of the Air Quality Action Plan to have a Local Plan that recognises the importance of air quality in terms of the environmental impact of development and the need for sustainable transport measures. The Gravesham Local Plan 2nd Review first deposit version incorporates the relevant policies of the Kent Structure Plan 1996 and addresses air quality issues through the following policies (summarised):

Air Quality

'Policy NE16 Development likely to results in emissions to air, by reason of its operational characteristics or the traffic generated by it, will require the submission of details to enable a full assessment of the impacts on air quality to be carried out. Such development will only be allowed if it does not have an unacceptable effect on health, amenity or the natural environment, taking into account the cumulative effects of other existing and proposed sources of air pollution in the vicinity. In making such an assessment, consideration will be given to whether or not the development would cause current national air quality standards to be exceeded.'

The above air quality policy has been adopted for development control purposes as part of the Local Plan Review. No objections were received at the first deposit stage, only a request for clarification. However, four provisional policies have been drawn up to ensure air quality is appropriately considered in the evolving development planning process. These policies will be put forward for adoption as part of the new Local Development Framework process (see paragraph 7.3.2).

Air Quality: Minimisation of Pollutants Development proposals will only be permitted where they are sited and designed to minimise the emission of air pollutants and the impact of air pollutants on the local environment.

Air Impact Assessments Development proposals that give rise to a potentially polluting activity, including the emission of dust, will only be permitted where they are accompanied by an assessment of the potential impact of the proposal on local air quality arising either from the operational characteristics of the development or the traffic generated by it.

Development in Air Quality Management Areas Development within an Air Quality Management Area will only be permitted if it can be demonstrated that the resulting long-term air quality situation will be satisfactory, and that short and medium term impacts can be minimised to an acceptable level.

Development sensitive to Air Pollution Development which would be sensitive to adverse levels of air pollution will not be supported where such conditions exist, or are in prospect, and where mitigation measures would not afford satisfactory protection.

Energy Efficiency

'**Policy NE24** New build development will only be allowed where it will give optimal energy efficiency through site layout, orientation, form and design.'

Location of Development

'**Policy T1** In considering development proposals, the Local Planning and Highways Authorities will consider the impact of the generated travel demand on the transport system as a whole and on the environment. Contributions towards the improvement of public transport provision and highways will be required depending on the scale, location and local circumstances of the proposal. Major development will be required to provide Travel Assessments, including a Parking Strategy and Green Travel Plan.

Policies T2 – T6 relate to the safeguarding of land for and encouragement of public transport improvements, including the Fastrack rapid transit network and the Gravesend Station Public Transport Interchange and the Channel Tunnel Rail Link and Ebbsfleet International and Domestic Stations. With major development proposed in the Kent Thameside area, the improvement of public transport facilities and encouragement of uptake will be essential to minimise the impact on air quality.

Cycling

'**Policy T7** The Borough Council will encourage the use of cycles as a means of travel for short and medium distance trips and for recreation and, to this end, will seek to implement a network of cycle routes throughout the Borough. It will work with all relevant agencies and funding sources to achieve this, as part of the Green Grid. In particular, it will encourage the completion of National Cycle Route 1 and protect this route from any development which would prejudice it.'

Walking

'Policy T8 The Borough Council will encourage walking as a means of travel for short distance trips and recreation. It will encourage the maintenance and enhancement of the network …..particularly in the context of the development of the Green Grid.'

Freight

'Policy T14 The Borough Council will seek to encourage commercial traffic to use the most appropriate routes to reach the trunk road network. Any major new development which generates a significant volume of commercial traffic will require the production of a traffic assessment on how it can be acceptably handled, given the other policies and proposals of this Local Plan Review. Transportation by rail and water will be encouraged.'

Construction Traffic

'**Policy T15** Developers of sites which will generate large volumes of construction traffic will be expected to produce Traffic Management Plans and to co-ordinate these with the relevant agencies and other developers who may be having an impact on the transport routes concerned. Use of rail and water transport will be encouraged where compatible with other policies.'

5.2 Gravesham Borough Council Local Agenda 21 (LA21) Strategy

LA21 originated from the Earth Summit in Rio de Janeiro in 1992. It incorporates the concept of sustainable development – meeting current needs without compromising the needs of future generations. The LA21 process enables communities to take an active role in conserving their local environment and improving their quality of life. GBC finalised its LA21 Strategy in May 2001 and this set out objectives and actions which can be tied in directly with the Air Quality Action Plan aim to improve local air quality.

These objectives include actions to:

- promote sustainable development of land within the Borough;
- ensure that energy efficiency of all housing within the Borough is improved;
- minimise the impact of all human activities undertaken within Gravesham on the environment;
- work towards a more efficient and integrated transport system;
- reduce traffic and congestion through its land use policies; and
- promote the movement of people by public transport, walking and cycling thereby improving air quality and health.

The LA21 Strategy objectives have largely been incorporated into the Kent Thameside Community Strategy and GBC Corporate Plan 2003 - 2007.

5.3 Kent Thameside Community Strategy 2003

The Community Strategy has been drawn up for Kent Thameside, which includes the Boroughs of Gravesham and Dartford, by the Kent Thameside Local Strategic Partnership. The Strategic Partnership includes representatives from the Borough Councils, as well as a wide range of community organisations. The Environment is listed as a key issue within the Strategy and the Strategy promotes sustainable development and transport in the area. One of the objectives is to 'act to address local air quality issues where necessary and traffic pollution in particular. This will include promotion of clean fuel technology, Green Travel Plans and influencing the patterns of development to help reduce the number of dwellings impacted by poor air quality. In addition, we will continue to work with firms to monitor and control industrial emissions'.

5.4 Gravesham Borough Council Corporate Plan 2003 - 2007

One of the Council's principal priorities is outlined in the Corporate Plan, "Taking Pride in Gravesham" is to "invest in protecting the environment and in providing quality public spaces." Improving air quality plays a major part in achieving this.

The Corporate Plan outlines a four-year programme which includes challenging targets aimed at improving the quality of life in Gravesham. The Corporate Plan sets out how GBC will take forward the actions proposed in the Community Strategy for the local area.

The Plan includes targets to ensure sustainable development of proposed major development sites, such as Ebbsfleet Valley, North East Gravesend and Lord Street/Parrock Road/Eden Place area, in addition to securing a dramatic improvement in public transport, notably through the Fastrack rapid transit network which will link the new developments to urban centres and transport interchanges.

The Corporate Plan also includes as one of its targets: "work towards achieving the National Air Quality Strategy Objectives" and the development and adoption of the Air Quality Action Plan is part of the strategy.

5.5 Kent Local Transport Plan

The White Paper ‘A New Deal for Transport’ set out new policy initiatives to create a better, more integrated sustainable transport system. This included greater emphasis on public transport, and cyclist and pedestrian accessibility, with initiatives such as Safer Routes to School, Green Transport Plans and Quality Partnerships between the local authority and transport operators. This was to be achieved through Local Transport Plans (LTP) with a five-year strategy for the implementation of local and regional transport measures. LTPs are required to be consistent with County Structure Plans, to ensure consistency and sustainability in transport proposals. KCC in partnership with the local authorities has developed the LTP for Kent. LTP strategies are likely to have a significant impact on local air quality and therefore need to be co-ordinated with Air Quality Action Plans.

6 FINANCING

Direct measures proposed for the A2 Trunk Road AQMA are the responsibility of the Highways Agency and will be required to be assessed in more detail for their cost-effectiveness through feasibility studies. The Department of Transport announced the preferred option for the widening and realignment of the A2 in the Gravesham area, which will secure significant air quality improvements to local residents in the A2 Trunk Road AQMA. An Environmental Impact Assessment is currently being undertaken for the Scheme, which has a potential funding of £60.5 million. The outcome of this assessment is expected in 2005 and works are proposed for 2005 - 2008. This Scheme, and other options proposed in the Final Action Plan that are the responsibility of the Highways Agency, will be required to pass the Highways Agency Value Management Assessment. This is likely to be one of the main constraints to achieving the air quality objectives within the required time-scale.

Direct measures proposed for the Northfleet Industrial Area AQMA will largely be funded by local industrial process operators through improvement programmes to processes aimed at reducing 'fugitive' PM_{10} emissions. One of the major contributors Lafarge Cement UK has already commenced their improvement programme for the Northfleet Works, which contains a suite of measures for minimising particulates (total cost of implementation: £4.409 million)

Indirect measures to improve air quality in the area will be funded by GBC, such as air quality monitoring and promotional activities, or by KCC through the Kent LTP. The LTP 2001/2 – 2005/6 has allocated funding to a number of Schemes in the Borough of Gravesham that tie in with Action Plan measures to improve overall air quality in the area. These include:

- £50,000 'Support for Green Travel Plans' in Kent Thameside; and,
- £40,000 for 'Safer Routes to School – Gravesend Challenge'.

- LTP bids were made for improvements to public transport in the area. The bids for the Gravesend Station Passenger Transport Interchange and *Fastrack* high quality public transport system (~£15 million for Phase 1) were successful.

The County Council provides funding though the LTP for the implementation of the cycling and walking strategies through a programme of improvements. GBC will work together with KCC to review current bids for the area in the light of the findings of the review and assessment of air quality. Additional bids will be made as necessary to secure further improvements in air quality.

7 DIRECT ACTIONS

The three sections below outline the direct actions included in the consultation process for the two AQMAs and also the indirect measures to improve air quality throughout the Borough. Direct measures to reduce NO_2 and PM_{10} concentrations within the AQMA concentrate on the dominant sources of emissions. Indirect measures target those general emissions within an area that aim to further reduce background levels of pollution above and beyond that likely to be achieved by existing national and international agreements.

7.1 Direct Actions for the A2 Trunk Road AQMA

The Highways Agency is responsible for the operation of the A2 Trunk Road. GBC has no direct control over the road network; however, GBC will work in co-operation with the Highways Agency and KCC to try to address air pollution issues from road traffic wherever possible.

The Highways Agency has issued guidance titled 'The Role of the Highways Agency in Local Air Quality Management' which sets out the Highways Agency's commitment to Local Air Quality Management (LAQM). Route Management Strategies, Multi-modal studies, junction improvements and encouraging more sustainable transport options, will bring about improvements in air quality. This document has been used extensively in considering the appropriate measures for the improvement of air quality within the A2 Trunk Road AQMA. The potential options to try to improve air quality within the AQMA have been identified, and assessed for their feasibility, cost effectiveness and potential impacts.

Measure 1: GBC will work together with the Highways Agency on the consideration of direct options for the A2 Trunk Road.

7.1.1 Option 1: Speed Regulation on the A2 along the section with relevant exposure

The introduction of speed limits on major roads has the ability to assist in maintaining a constant traffic flow and will reduce overall traffic emissions.

Speed regulation has been piloted by the Highways Agency on the M25 using a variable mandatory speed limit according to congestion levels. Enforcement is through the use of speed cameras. The scheme is now fully operational and has been successful in improving traffic flow, reducing accidents and reducing road traffic emissions. Speed restriction has also been introduced on the bus lane section of the M4 and this continues to be successful in alleviating congestion.

The air quality impact of reducing the speed limit from 113kph (70mph) to 80kph (50mph) on the A2 west of Pepperhill was assessed using the DMRB emission factors toolkit 2002. The results showed that a predicted reduction in NOx of 19 $\mu g/m^3$ at the roadside could be achieved by a blanket speed restriction on this stretch of the A2. The reduction required within the AQMA to meet the NO_2 annual objective is 11.4$\mu g/m^3$ and therefore this direct action could achieve the required reduction. With a variable speed limit reducing to 80kph (50mph) during peak hour periods (e.g. 7am – 9am and 5pm – 7pm, which accounts for >3rd AADT), it is predicted that the objectives will be met even at the worst- case location on the A2 at Cobham.

Objective	To reduce emissions through speed restrictions to achieve a more optimal speed for reduction in traffic emissions. To be implemented as either a blanket speed limit or a variable limit depending on traffic flow and time of day e.g. peak hours only.
Responsibility	The Highways Agency. Enforcement of speed restriction would also need to have input by the Kent Police traffic department.
Air Quality Impacts	The reduction in NO_2 and PM_{10} concentrations required within the AQMA to achieve the objectives could be achieved by this option alone.
Non Air Quality Impacts	Positive: Reduction in noise levels and improvements in safety. Cost savings through reduced fuel consumption. Negative: Potential for increased journey times at non-peak times.
Perception	Likely to be negative by A2 Trunk Road users due to potential for increased journey times.
Cost-effectiveness & Feasibility	Costs of signage and ongoing enforcement issues to be considered in greater detail in the feasibility study. Costs likely to be lower for blanket speed limit than variable with the need for variable message signage, but overall considered moderate.

Results of Consultation Process
The consultation process has confirmed that this direct action is strongly supported by the public.

The Highways Agency's comments stated that due to cost they would not be progressing this option. They also confirmed that the necessary infrastructure for implementation at a later date would not be installed when the scheme is built.

Despite this comment the option of variable speed limits has been included in the Highways Agency's current consultation process on the A2/M2/A249 Route Management Study which closes on June 14th 2004.

Decision
GBC will continue to pursue this direct action with the Highways Agency and will seek further support and advice from Defra on this matter.

GBC will support the option of introduction of variable speed limits along the A2 in the Highways Agency's current consultation on A2/M2/A249 Route Management Study.

7.1.2 Option 2: Compulsory purchase of properties

The use of Compulsory Purchase Orders would lead to the removal of relevant public exposure but does not address the problem of air pollution and should only be considered where there are no other viable options.

Objective	To remove the residents within the A2 AQMA from exposure to NO_2 and PM_{10} levels above the air quality objective.
Responsibility	Control of this option rests with Central Government.
Air Quality Impacts	This option would remove residential properties and therefore relevant exposure, so that there would be no need for an AQMA.
Non Air Quality Impacts	Positive: Removal of residents from exposure to high noise levels from the A2. Negative: Socio-economic impacts. Potential blight for adjacent properties.
Perception	Likely to be negative perception by local residents.
Cost-effectiveness & Feasibility	Cost-effectiveness depends on the number of properties concerned (there are 784 properties within the AQMA). Compulsory purchase of all properties within the AQMA would therefore have a high cost. Not considered feasible on this large scale. Potential legal problems in execution.

Results of Consultation Process
The consultation process has indicated that whilst the majority of the residents within the AQMA find the option of compulsory purchase unacceptable the minority were strongly in favour of it. This was indicated to be due to their inability to sell their property because of the poor environmental conditions particularly noise.

Due to inaccurate press coverage of this option for the A2 the council received enquiries from many very concerned residents who believed that his option had been accepted by the Council as the only way forward for the properties within AQMA.

This process therefore has confirmed that this option is on the whole not socially acceptable and that even residents living very close to the kerbside wish to remain in their homes.

Decision
This option will not be progressed for the A2 Trunk Road AQMA.

7.1.3 Option 3: Reduction in overall traffic flows on the A2

Results from the Stage 4 Review and Assessment show that a predicted reduction of 12.6 $\mu g/m^3$ NOx could be achieved by reducing AADT to 100,000 (~10.5%). The reduction in NOx required within the AQMA to meet the NO_2 annual objective is 11.4$\mu g/m^3$ and therefore a reduction of 10.5% would be required if this Option alone was considered. The Kent Local Transport Plan 2001-06 had a target to reduce the rate of traffic growth by 0.06% for Gravesend Outer Cordon compared to a predicted growth rate of 12.6% by 2006. With the proposed major development within the Kent Thameside region and high predicted traffic growth it is difficult to see how an overall reduction in traffic levels can be achieved.

Objective	To reduce overall emissions from vehicles by reducing the total number of vehicles on the A2
Responsibility	Central Government, Highways Agency. National intervention will be required to achieve substantial reductions e.g. fiscal measures to encourage modal shift.
Air Quality Impacts	Substantial reductions of total flows (>10%) would be required to achieve the necessary air quality benefits.
Non Air Quality Impacts	Reductions in overall noise levels at nearby properties. Reduced traffic volume may improve journey times.
Perception	Policies aimed at reducing the number of vehicles on the roads are likely to be seen as restrictive by road users. Local residents in the area are likely to view this Option positively.
Cost-effectiveness & Feasibility	Costs would be dependent on the measures used to reduce traffic flows, but will be long term and not likely to be achievable by the 2004/5 objective timescales.

Results of Consultation Process
The consultation process highlighted that the public strongly support this option, however the consultation also indicated that the public felt that public transport would need to be improved greatly in security, cleanliness and regularity before they would use it rather than their own car.

The Highways Agency have confirmed that a 10.5% reduction in overall traffic flows would be required to achieve the objective. The Agency has also confirmed that this option should be included in the Final Action Plan for any AQMA near roads. The comment was also made however that a reduction of this magnitude seems unlikely without changes to infrastructure or public transport but a smaller reduction would still bring the achievement date forward.

Decision
This action will be taken forward but it is not considered that it would be effective in the short term and that long-term projects to improve local transport need to be undertaken in a partnership between GBC, KCC and transport providers.

7.1.4 Option 4: Reduction in %HGV flows on the A2 Trunk Road

Rail infrastructure improvements within Kent are necessary to realise the switch of freight from road to rail. No new capacity for rail freight between Kent and London is currently planned and therefore KCC has pressed for freight to be carried on the Channel Tunnel Rail Link. This link is capable of taking fast freight trains, such as postal freight car transporters, but conventional freight will be excluded as they will be too slow to use this high-speed link. To maximise the use of the Channel Tunnel Rail Link, KCC are pressing for slower conventional freight trains to be allowed to run at night when passenger trains are not running.

The Stage 4 source apportionment work identified HGVs as the major source of NOx and PM_{10} emissions. A reduction in volume of these types of vehicles would therefore have a greater overall impact on air quality than a reduction in total vehicle numbers.

The air quality impact of reducing %HGV on the A2 (West of Pepperhill) from 14% to 12% has been assessed in the Stage 4 Review and Assessment. The results show that a predicted reduction of 13.0 $\mu g/m^3$ could be achieved. The reduction in NOx required within the AQMA to meet the NO_2 annual objective is 11.4$\mu g/m^3$ and therefore a reduction of approximately ~14% would be required if this Option alone was considered. This option is a long-term option and is likely to be more effective as part of a suite of measures.

Objective	To reduce emissions of NOx and PM_{10} by reducing the volume of the most polluting source identified in the Stage 4 – HGV traffic
Responsibility	Central Government, Highways Agency. National intervention will be required to achieve substantial reductions in road freight.
Air Quality Impacts	The required improvement in air quality is predicted to be achieved by removing ~14% of the HGVs from the A2. The air quality benefits are greater by targeting the most polluting source.
Non Air Quality Impacts	Reductions in overall noise levels at nearby properties. Reduced volume of HGV traffic may improve journey times. Socio-economic – additional costs of distribution.
Perception	Negative: Seen as restrictive for freight distribution. Potential increased costs of other modes of distribution. Positive: Potential benefits to local residents and other road users.
Cost-effectiveness & Feasibility	For large scale shift in freight distribution, investment in the rail network for increased freight and potential fiscal benefits to make rail freight more attractive are likely to be costly. It is likely to be a long-term measure i.e. not achievable by 2004/5. KCC is working with the Road Haulage Association and Rail Operators to develop Quality Partnerships and improve uptake of rail freight locally, notably on the Channel Tunnel Rail Link.

Results of Consultation Process
The consultation process indicated very strong support for this option. This is likely to be as a result of HGVs being the single most polluting vehicles on the A2. However this action is considered by the Council as being difficult to implement and will not have a short-term benefit on the local levels of air pollution.

The Highways Agency have confirmed that KCC is working with the Road Haulage Association and Rail Operators to develop Quality Partnerships and improve uptake of rail freight locally. The Agency feel that this option is an important part of the Action Plan as it would target the largest polluter.

Decision
This option will therefore be taken forward but as a complimentary measure to supplement the realignment of the A2. This is because it will only achieve improvements in the mid to long-term due to the significant change needed in both County and Government Policy on the use of increasing railway use for freight.

7.1.5 Option 5: Reduction in overall background levels

Objective	To reduce the background levels throughout the Borough.
Responsibility	Central Government, KCC and GBC. National policies will be required to achieve significant reductions in background levels, such as through tighter fuel emissions standards, fiscal measures and controls of industrial emissions. Indirect measures by KCC and GBC to improve air quality are outlined in Section 7.3.
Air Quality Impacts	Improvements throughout the Borough could be achieved, but the impact on NOx and PM_{10} emissions within the AQMA is likely to be small without National Policies.
Non Air Quality Impacts	Socio-economic. Tighter standards and controls could affect industry, businesses and the public.
Perception	Dependent of the measures introduced. Tighter controls and fiscal measures are likely to be viewed negatively. Local measures such as through travel plans and quality partnerships are likely to be viewed more positively.
Cost-effectiveness & Feasibility	Dependent on the measures introduced. Action is already underway on local measures to improve air quality in the area.

Results of Consultation Process
The consultation process has indicated that the public do not strongly support this option. This is likely to be due to the lack of appreciation by the public of the significant effect that a high background level has on local air quality with relatively little local contribution causing exceedences of objectives.

It is considered as a necessity by the Council to progress this option despite lack of public support in order to attempt to reduce the already high background levels in this area.

Local action by KCC and GBC is likely to result in only minimal improvements and so national policies are required in order to bring about significant improvements.

Decision
It is therefore considered necessary to progress this option with relevant government departments in addition to carrying out local indirect measures.

7.1.6 Option 6: Introduction of tolls

Objective	To influence driver behaviour and promote modal shift through tolls, either for a particular route e.g. the A2, or an area.
Responsibility	Central Government, Highways Agency. Options for tolls within the area are considered as part of the regional Multi-model Study.
Air Quality Impacts	The impact of introducing tolls will be dependant on the type of toll introduced and the model shift that can be achieved. This action may cause traffic to shift to M20 if not introduced onto A2 and M20 simultaneously. It may also cause a traffic shift to residential roads thus worsening air quality in residential areas of the borough.
Non Air Quality Impacts	Socio-economic impacts of road charging on businesses and the public. Reductions in flows may lead to potential benefits in noise reduction and improved journey times.
Perception	Likely to be viewed negatively by private vehicle users.
Cost-effectiveness & Feasibility	The costs of introducing tolls can be off-set by the revenue which is generated. Area wide tolls are likely to be more costly than a designated route. The feasibility of area wide schemes is being considered in the Multi-modal Studies and it is unlikely that they will be introduced in the short term to achieve the air quality objective.

Results of Consultation Process
This option was not supported by the public due to the additional cost to them of using the local Trunk Road. On further consideration of the effects of introducing the toll this option was viewed by the Council as unsatisfactory. These effects would be increased exhaust emission due to vehicles slowing down/stopping for tollbooths and also the local traffic using local roads through residential areas instead of using the Trunk Road. This would worsen air quality in the residential areas.

The Highways Agency have commented that the Department for Transport is currently considering road user charging but this is unlikely to be given the go ahead before 2011.

Decision
This option will not be progressed due to the likely negative impact on the local residential road network.

7.1.7 Option 7: Realignment of the A2 Trunk Road

The Department of Transport announced the preferred option for widening the A2 in the Gravesham area, which is to reduce congestion and improve safety on the 6.5km section between Pepperhill and Cobham junctions south of Gravesend, where the AQMA has been declared. Between these junctions, the new four lane A2 will run to the south of the present A2 close to the Channel Tunnel Rail Link.

The Scheme will improve the air quality for hundreds of local residents, although some 400 properties may still remain within an area of exceedence for NO_2 and PM_{10} objectives. This is due to the line of the new road being very similar to the old road in the area of Pepperhill where the new road pulls away form the old line and also at Marling Cross where the new road rejoins the old carriageway. There may also be other areas along the length of the new road which may not be removed from the AQMA completely dependent on distance of the new carriageway from the housing.

There are three junctions along this stretch of the A2 and the realignment will include junction improvements, which will improve traffic flows. However, at the Pepperhill junction congestion problems are likely to remain without improvements to adjoining links (via Springhead Road) in the local road network and GBC will be pressing the transport authorities for these additional necessary improvements to take place to secure air quality improvements.

The new A2 will allow for variable message signage to be installed for speed regulation securing further improvements within the area. At present, it is considered economically impractical to undertake such works on the A2 on this section as electricity and available gantries are not readily available and proposals for the new A2 are due to start in 2005.

Objective	To widen the A2 to reduce congestion and improve safety along the A2 between Pepperhill and Cobham and realign the A2 to improve flows and reduce the impact of vehicle emissions.
Responsibility	Highways Agency
Air Quality Impacts	Significant air quality improvements for local residents will be achieved by this Scheme. The AQMA will be reduced in size and ~400 properties (currently 784) will remain in the area of exceedence
Non Air Quality Impacts	Improvements in car journey times due to improved flows. Reduction in noise for local residents.
Perception	Will be viewed positively by road users and local residents (once the short term disruption due to improvement works is over).
Cost-effectiveness & Feasibility	The Department for Transport has set the nominal cost of the proposed scheme at 60.5 million pounds. An Environmental Impact Assessment is being undertaken by the Highways Agency on this Option and works are proposed for 2005 - 2007.

Results of Consultation Process
The consultation process indicated that this was the preferred choice of option. This option however would have been progressed by the Highway Agency regardless of the results of the consultation process. The Highways Agency have commented that this option would reduce the number of properties in the AQMA. Also that it is hoped that the scheme would open in 2008 if it is given the go ahead.

Decision - This option will therefore be taken forwards with regard the continued negotiation with the Highways Agency to secure the most advantageous route in terms of environmental conditions for local residents.

7.2 Summary of the Direct Options for the A2 Trunk Road AQMA

A summary of all Options considered for the A2 Trunk Road AQMA is provided in Table 5 on the next page.

The ranking of options has been based on a number of considerations; including the costs and benefits of all the options, feasibility and acceptability, and whether they will achieve the air quality objective. The results of the consultation process have been indicated in the column titled "Public Consultation Rank" this is the order of preference as indicated by the reply forms returned to GBC during consultation period 03/02/04 to 31/03/04.

The costs are provided as:

- 'Low' (up to £1 million);
- 'Medium' (between £1 million – £5 million); and,
- 'High' (> £5 million).

The Options, which achieve the highest ranking, prior to the consultation process were Speed Regulation and ongoing measures to reduce background concentrations. Speed Regulation could achieve the objectives at moderate costs. The Longer-term goal (2007) is the realignment of the A2.

The preferred direct actions following the consultation process are the realignment of the A2 Trunk Road in conjunction with variable speed regulation.

Table 5 Summary of Action Plan Direct Options for the A2 Trunk Road AQMA

Action	Description	Organisation responsible	Date to be achieved by	Cost	Air quality improvement in AQMA	Other potential impacts	GBC Rank	Public Consultation Rank	To be taken forward
Option 1	Speed Regulation	Highway Agency/ Police	Due to the present lack of variable signage and proposals to move the A2, unlikely to be achieved by 2005	Low (without enforcement) Medium (with ongoing enforcement)	Most effective method to achieve the objectives by 2005	Reduction in noise levels. Improvements in safety. Cost savings through reduced fuel consumption. Increased journey times during non-peak hours.	1	3	Yes
Option 2	Compulsory purchase of properties	Central Government	Unlikely to be achieved before 2005	High (>£50 million)	Removes relevant exposure so objective will be met	Socio-economic impacts. Potential blight for adjacent properties.	7	7	No
Option 3	Reduction in traffic flows on the A2	Central Government/ Highways Agency	Unlikely to be achieved before 2005	High	10.5% reduction would be required to achieve objective	Reductions in noise. Improved journey times.	6	4	Yes
Option 4	Reduction in %HGV flows on the A2	Central Government/ Highways Agency	Unlikely to be achieved before 2005	High	14% reduction would be required to achieve objective at A2	Reductions in noise. Improved journey times.	5	2	Yes
Option 5	Reduction in overall background levels	Central Government/ KCC/GBC	Ongoing at a local level. National policies unlikely to be implemented before 2005	Low - Medium (Depends on extent of measures)	Depends on extent of measures, but unlikely to achieve necessary reduction by 2005.	Dependent on measures. Socio-economic - tighter standards and controls could affect industry, businesses and the public.	1 (ongoing. Will be in conjunction with other measures)	5	Yes
Option 6	Introduction of tolls	Central Government/ Highways Agency	Unlikely before EU Limit target date of 2010	High (but costs recoverable)	Depends on the type of scheme and extent of modal shift	Socio-economic impacts of road charging. Reductions in flow may lead to noise reduction/ improved journey times.	4	6	No
Option 7	Realignment and widening of the A2	Highways Agency	To be completed 2007	High. £60.5 million	Will reduce the size of the AQMA from 784 homes to~400.	Improved journey times with improved traffic flows	3	1	Yes

7.3 Direct Measures for the Northfleet Industrial Area AQMA

The following options were the product of both the Air Quality Action Plan Scoping Report (May 2003) and the Air Quality Working Group (June 2003). A number of measures that have been proposed to reduce 'fugitive' PM_{10} emissions in the Northfleet Industrial Area in pursuit of the PM_{10} air quality objective.

7.3.1 Option 1: Measures to minimise releases at Lafarge Cement UK Northfleet Works

Lafarge Cement UK Northfleet Works has been confirmed in the Stage 4 Review and Assessment as a major contributor to 'fugitive' (uncontrolled) PM_{10} emissions in the Northfleet Industrial Area AQMA.

The Environment Agency is the authority responsible for the permitting and enforcement of pollution controls at this site under the Pollution and Prevention Act 1999 and the Pollution Prevention and Control (England and Wales) Regulations 2000. The Environment Agency served a Schedule 4 Notice under the above Regulations in December 2001 requiring further information on the Best Available Technology (BAT) improvement programme for the Northfleet Works.

The Northfleet Works has limited reserves of chalk and is due to close in 2008. The Works will be relocated at Holborough in the neighbouring authorities of Medway and Tonbridge and Malling. The new Medway Works will be state-of-the-art with full application of BAT to minimise releases. However, the timing of the closure will influence the BAT improvement programme for the Northfleet Works, as full application of BAT will not be economically realistic.

Lafarge Cement UK have undertaken a detailed review of the significant environmental impacts and submitted an improvement plan for the Northfleet Works in response to the Schedule 4 Notice.

A summary of the proposed measures to minimise PM_{10} releases from the site are shown in the table overleaf.

Summary of measures to minimise PM_{10} at the Northfleet Works

Improvement measure	Air quality improvement	Timescale to be achieved	Cost
Kiln Particulates			
To install gas flow indication and dust monitors on the Electrostatic Precipitators	Improved treatment time of gas-flow through precipitation. Greater control over emissions through improved monitoring of emissions.	Complete	£93,000
Replacement of inlet bank electrodes on the Electrostatic Precipitators of Kiln 2		Complete	£204,000
Replace obsolescent controllers		Pending	£238,000
Calibration and certification of duct monitors		Ongoing	£15,000
Kiln Particulates - total	*Reduction in dust loading by 20 mg/m^3*		*£550,000*
Kiln Cooler Particulates			
Reduce cooler Electrostatic Precipitators in-leak	Reduced dust emissions during times of kiln instability	Ongoing	£60,000
Rapping gear improvements		Ongoing	-
Calibration and certification of duct monitors		Ongoing	£15,000
Kiln Cooler Particulates - total	*Reduced dust emissions during times of kiln instability*		*£75,000*
Cement Mill Particulates			
Systematic reduction in the number of mill start ups and shut downs	Reduced emissions during start up and shut down	Ongoing	-
Calibration and certification of duct monitors		Ongoing	£15,000
Cement Mill Particulates - total			*£15,000*
Fugitive dust emissions			
Improvement of cement conveying and loading	These measures tackle what have been assessed as being the major sources of fugitive dust and PM_{10} from the site. Monitoring will be required to quantify the success of these improvement measures.	Ongoing	£1.153 million
Improvement of cooler drag area		Under development	£209,000
Recondition coal mill ducts and primary de-dusting equipment		Pending	£60,000
Install roller doors at rail silo loading area		Pending	£47,000
Improvement of import clinker system		Completed	£875,000
Improve the process waste disposal system (return to kiln feed belts)		Under development	£80,000
Improve coke storage		Complete	-
Improvement of clinker transportation system (DCEs)		Under development	£200,000
Revised plant housekeeping		To be confirmed	£1.145 million
Fugitive dust emissions - total			*£3.769 million*

Option 1: Measures to minimise releases at Lafarge Cement UK Northfleet Works contd.

Objective	Reduce PM_{10} concentrations within the AQMA by reducing overall dust emissions from Lafarge Cement UK Northfleet Works through changes to process technology and procedures
Responsibility	Lafarge Cement UK and Environment Agency, GBC
Air Quality Impacts	Reduction in PM_{10} concentration within the 1000m 'footprint' identified. Air quality benefits would be monitored at the industrial background monitoring site.
Non Air Quality Impacts	Reduction in nuisance dust for local residents. Improvements in local amenity. Socio-economic implications of increased costs to Lafarge Cement UK and local employment opportunities
Perception	Will be viewed positively by local residents.
Cost-effectiveness & Feasibility	Improvements have already been implemented at the site and GBC is liasing with Lafarge Cement UK and the Environment Agency on the implementation timetable for other measures. Proposed measures are low – medium cost. Low cost improvement measures, such as improved management practices and housekeeping will be the most cost effective and there will be benefits to Lafarge Cement UK through reduction in lost materials. The effectiveness of the proposed improvements in achieving the PM_{10} air quality objective is difficult to quantify. Further source apportionment work and monitoring would be required.

Results of Consultation Process
This option was considered by the public to be the most preferable. This option is considered by the council to be the quickest method by which improvements in local fugitive PM10 can be attained.

The Environment Agency have issued Lafarge Cement UK Ltd a new permit for operation at the Northfleet works under the Pollution Prevention and Control Regulations 2000. The permit details an Improvement Plan and timetable for all works to be completed by early 2005. The Environment Agency confirm that these works will bring the site up to BAT (Best Available Technique) but have confirmed that the actual improvement in fugitive emissions of PM10 cannot be predicted.

A response from Lafarge Cement UK Ltd on the content of the draft Action Plan is still awaited.

Decision
This option is to be taken forward and progressed with both Lafarge Cement UK Ltd and the Environment Agency to ensure programmed works are carried out as agreed and in accordance with permit conditions.

Measure 2: GBC will continue to work closely with Lafarge Cement UK and the Environment Agency to secure the necessary improvements at the Northfleet Works

7.3.2 Option 2: Relocation of the Lafarge Cement UK Northfleet Works

Objective	Reduce PM_{10} concentrations within the AQMA by eliminating the dust emissions sources at the Lafarge Cement UK Northfleet Works through closure and relocation to Tonbridge and Malling/Medway (2008)
Responsibility	Lafarge Cement UK, Environment Agency, GBC
Air Quality Impacts	Significant reduction in PM_{10} concentrations within the Northfleet Industrial Area AQMA. It will not result in the achievement of the 2004 objective due to the timescale required for relocation.
Non Air Quality Impacts	Reduction in nuisance dust for local residents. Improvements in local amenity. Major redevelopment opportunities for the site as set out in the first deposit version of the Gravesham Local Plan Second Review. Northfleet Embankment is a priority area for action under the Sustainable Communities Initiative launched by Office of Deputy Prime Minister in 2004. Socio-economic implications for local businesses and employment reliant on the Works
Perception	Will be viewed positively by local residents.
Cost-effectiveness & Feasibility	Only feasible and cost-effective over the long term, as the cost of relocation is High.

Measure 3: GBC will continue to work closely with Lafarge Cement UK and the Environment Agency on the relocation timetable

Results of Consultation Process
This option was considered by the public to be the second most preferable. This option is considered by the council to be the only long-term solution to the high levels of local fugitive PM10 emissions.

The Environment Agency have included a condition in the work's new permit that all wet clinker production must cease by April 2008. This however does not ensure that the plant will close completely on that date.

A response from Lafarge Cement UK Ltd on the content of the draft Action Plan is still awaited.

Decision
GBC will continue to pursue the future closure of the plant with both the Environment Agency and Lafarge Cement UK Ltd.

7.3.3 Option 3: Reduction in PM_{10} emissions from the combined impact of industrial processes in Northfleet

A number of industrial sources within and bordering the Northfleet Industrial Area AQMA have been identified in the First Round of Review and Assessment with the potential to emit PM_{10}.

Through discussions between GBC and local industries, advice can be provided to businesses on Best Practice. This would be achieved through the Air Quality Working Group and the Local Business Partnership. As such, cost-effective voluntary measures such as implementing environmental management systems and improving housekeeping practices could be achieved. An inventory of relevant businesses in the Northfleet area is being drawn up by GBC, and this will enable advice to be targeted more effectively at the most significant contributors.

This will be supplemented by regular site inspections and enforcement action for prescribed industrial processes regulated by GBC and the Environment Agency under Part 1 of the Environmental Protection Act 1990 and subsequent Pollution Prevention and Control Regulations 1999. Processes which are not regulated under this legislation and which cause dust problems are enforced by GBC Environmental and Public Health Services under the Environmental Protection Act 1990 Part III for Statutory Nuisance or through Planning controls, such as planning conditions. The Clean Air Act 1993 also gives GBC various powers to control airborne emissions from certain industrial processes, such as emissions of dark smoke. GBC is a signatory to the Government's Enforcement Concordat, the Council has a relevant (and periodically reviewed) Enforcement and Prosecution Policy in place to ensure that enforcement action is undertaken effectively.

Objective	Reduce PM_{10} emissions from all relevant Northfleet industrial processes through achievement of Best Practice
Responsibility	GBC, the Environment Agency, Local Business Partnership
Air Quality Impacts	Reduction of PM_{10} concentrations within the AQMA. It is not known to what extent improvements at individual processes will have on achieving the 2004 Objective.
Non Air Quality Impacts	Reduction in nuisance dust for local residents. Improvements in local amenity. Socio-economic implications for local businesses
Perception	Will be viewed positively by local residents. Partnership working and provision of advice to businesses is likely to be viewed more positively than enforcement action.
Cost-effectiveness & Feasibility	The costs of implementation will generally be low, but the effectiveness of achieving the objective is unknown. It is more likely to be effective in combination with other actions.

Measure 4: GBC will work in partnership with local industries in the Northfleet Area to secure improvements in air quality

Results of Consultation Process
The public consultation indicated that this was the third most preferred option by the public. The council considers that further investigation into the source of fugitive particulate matter (PM10) in the Northfleet Industrial Area AQMA is a priority. The EA supports this option.

Decision - This option will be taken forward and all potential sources of particulate matter (PM10) will be identified. GBC will ensure that all processes will be brought to the attention of the relevant enforcement agency for investigation with reference to appropriate legislative controls.

7.3.4 Option 4: Compulsory Purchase of Properties

As discussed in the previous Section, the use of Compulsory Purchase Orders would lead to the removal of relevant public exposure but does not address the problem of air pollution and should only be considered where there are no other viable options. With major redevelopment proposed in the area, this Option would conflict with regional and local Planning Policies.

Objective	To remove relevant public exposure to PM_{10} levels above the air quality objective.
Responsibility	Control of this option rests with Central Government.
Air Quality Impacts	This option would remove residential properties and therefore relevant exposure, so that there would be no need for an AQMA.
Non Air Quality Impacts	Negative: Socio-economic impacts for local community. Potential blight in the area.
Perception	Likely to be negative perception by local residents and GBC.
Cost-effectiveness & Feasibility	Relatively low cost as only three residential properties.

Results of Consultation Process
The consultation process has indicated that the majority of the residents consulted find the option of compulsory purchase unacceptable.

Due to inaccurate press coverage of this option the council received enquiries from many very concerned residents who believed that this option had been accepted by the Council as the only way forward for the properties within AQMA.

This process therefore has confirmed that this option is not socially acceptable and that even residents living very close to the source of the pollutants wish to remain in their homes.

Decision
This option will not be progressed for the Northfleet Industrial AQMA.

7.3.5 Option 5: Additional Street Cleaning Measures

GBC undertake street cleaning throughout the Borough. Street cleaning could be enhanced in areas identified as having higher 'fugitive' dust burdens e.g. within the Northfleet AQMA. Dust on road surfaces can become re-suspended by vehicle movements and lead to increases in airborne particulates. Regular removal of dust on road surfaces would therefore ensure they did not get entrained into the air. The most appropriate method of cleaning would have to be considered to ensure that the dust is not merely dispersed. Wet sweeping is likely to be more effective in this regard, but is more costly than dry sweeping.

Objective	To reduce 'fugitive' dust emissions on road surfaces and prevent re-suspension
Responsibility	GBC/Local Industry
Air Quality Impacts	Impacts likely to have localised benefits near to roads with heavy dust burdens
Non Air Quality Impacts	Reduction in nuisance dust for local residents. Improvements in local amenity.
Perception	Likely to be viewed positively by local residents.
Cost-effectiveness & Feasibility	Relatively low cost to implement, but cost is not borne by the polluter. Effectiveness is likely to be low in terms of the overall reduction in PM_{10} required and localised.

Results of Consultation Process
The public consultation indicated that there was strong feeling that the tax payer should not be responsible for additional street cleaning needed directly as a result of local fugitive dust emissions and that the polluter should be financially responsible.

Decision
The council will therefore progress this matter with known local polluters in order to secure the finance of any additional street cleaning measures deemed necessary in areas known to have high levels of particulate matter.

7.4 Summary of the Direct Options for the Northfleet Industrial Area AQMA.

A Summary of the direct options for the Northfleet Industrial Area AQMA is shown in Table 6.

The ranking of options has been based on a number of considerations; including the costs and benefits of all the options, feasibility and acceptability, and whether they will achieve the air quality objective. The results of the consultation process have been indicated in the column titled "Public consultation Rank" this is the order of preference as indicated by the reply forms returned to GBC during consultation period 03/02/04 to 31/03/04.

The costs are provided as:

- 'Low' (up to £1 million);
- 'Medium' (between £1 million – £5 million); and,
- 'High' (greater than £5 million).

The Options, which achieve the highest ranking, are the improvements to the Lafarge Cement UK Northfleet Works, in combination with reductions in PM10 from other industrial processes and additional street cleaning. These are achievable in the short term. The longer term goal (2008) is the relocation of the Lafarge Cement UK Works

The preferred direct actions following the consultation process are measures taken by the Environment Agency to minimise releases at Lafarge Cement UK Northfleet Works, the relocation of Lafarge Cement works and the Reduction in PM_{10} emissions from combined impact of industrial processes in Northfleet.

Table 6 Summary of direct measures proposed for the Northfleet Industrial Area AQMA

Action	Description	Organisation responsible	Date to be achieved by	Cost	Other potential impacts	GBC Rank	Public Consultation Rank	To be taken forward?
Option 1	Measures to minimise releases at Lafarge Cement UK Northfleet Works	Lafarge Cement UK, Environment Agency, GBC	To be confirmed (Short/ medium term)	Range low – medium cost measures proposed. Total: £4.409 million	Reduction in nuisance dust and improvement in local amenity	1=	1	Yes
Option 2	Relocation of the Lafarge Cement UK Northfleet Works	Lafarge Cement UK, Environment Agency, GBC	Relocation timetable not definite, but proposed for 2008	High (£180 million).	Reduction in nuisance dust and improvement in local amenity Major redevelopment opportunities for the site, as set out in the first deposit version of the Gravesham Local Plan Second Review. Socio-economic implications for local businesses and employment reliant on the Works	4	2	Yes
Option 3	Reduction in PM_{10} emissions from combined impact of industrial processes in Northfleet	GBC, the Environment Agency, the Local Business Partnership, local industries	Ongoing (Short/mediu m term)	Low – medium (dependent on measures required)	Reduction in nuisance dust and improvement in local amenity Socio-economic impacts on local businesses	1=	3	Yes
Option 4	Compulsory purchase of properties	Central Government	Unlikely to be achieved before 2005	High (>£50 million)	Socio-economic impacts for local community. Potential blight in the area.	5	5	No
Option 5	Additional Street Cleaning Measures	GBC	To be confirmed (Short term)	Low	Reduction in nuisance dust and improvement in local amenity	1=	4	Yes

7.5 Proposed Indirect Boroughwide Measures to Improve Air Quality

There are indirect measures that can be implemented by GBC, or which GBC can feed into, aimed at improving the air quality throughout the Borough. These will reduce background pollution concentrations and indirectly will work towards achieving the Air Quality Objectives within the AQMAs.

7.5.1 Transport measures

GBC works together with KCC on local transport issues including the implementation of LTP measures in the Borough of Gravesham and Kent Thameside area. Relevant strategies and initiatives within the LTP, which have potentially beneficial impacts on air pollution from transport sources, are considered below.

Measure 5: GBC will ensure that the Final Action Plan measures are co-ordinated with relevant LTP measures and provide KCC with annual progress reports on air quality

Public transport improvements

GBC policies require major development to be designed around public transport links. *Fastrack*, a new high quality bus-based transit system, is being developed to link existing and new communities with public transport interchanges and main urban centres and offer an attractive alternative to the private car for local journeys in Kent Thameside. GBC is liasing closely with KCC to help deliver *Fastrack.* The first deposit version of the Local Plan 2nd Review contains appropriate safeguarding for *Fastrack* and negotiations and planning applications on the major sites are helping secure its phased provision.

Fastrack aims to significantly increase the proportion of local journeys made by public transport, and will therefore help reduce any worsening in local traffic emissions, especially where related to new development in Kent Thameside. Phase 1 of *Fastrack* will provide a core route from Dartford to Gravesend railway stations via Northfleet, and bus priority measures already installed on this route are benefiting buses in Gravesham.

Section 2 of the Channel Tunnel Rail Link, including a new International and Domestic station at Ebbsfleet, is scheduled for completion in 2006/7. Enhanced facilities in the local network will encourage further uptake of public transport and help reduce the impact of proposed development in the area**.**

Targets to increase public transport in Kent are contained in the LTP (Policy S22) and the 2002 Annual Progress Report showed this target was on track, with a 0.7% increase in bus patronage from 2000/1 – 2001/2.

Measure 6: GBC will work together with KCC to improve public transport facilities within Gravesham and develop quality partnerships with transport providers to promote greater uptake of public transport.

Green Travel Plans

A Travel Plan is a general term for a package of measures tailored to the needs of an organisation to introduce greener, cleaner and sustainable travel choices and reduce the reliance on the car. It involves the development of a set of mechanisms, initiatives and targets that together can enable an organisation to reduce the impact of travel and transport on the environment. This will include the consideration of alternative fuels.
School Travel Plans – The LTP Objective is for all schools to produce a school travel plan and increase the number of children walking and cycling to school by 20% by 2005/6 (Policy S30). An LTP bid was made in 2001 for 'Support for Green Travel Plans' in Kent Thameside (£50,000) and 'Safer Routes to School – Gravesend Challenge' (£40,000).

Employer Travel Plans – The LTP Objective is to approach all major employers with more than 200 personnel and offer assistance to establish Green Travel Plans and assist in the implementation of 10 Green Travel Plan's per year by 2005/6 (Policy S31). Groundwork Kent Thameside work together with GBC, businesses and schools to promote sustaining modes of transport and design Green Travel Plans, including safe routes to school, cycling and walking.

GBC have developed a Council Green Travel Plan to help manage and reduce the Council's impact on the environment and improve travel choices for staff. A staff survey was undertaken in 2001 which was used to assess the modes of business travel and commuting and gauge support for potential travel plan options. Options provided within the travel plan include:

- Car Sharing
  This has been implemented as an informal scheme within the Council, but will be extended through the KCC Kent Car Share Scheme which GBC has signed up to.
- Interest Free Season Ticket Loans
  As an incentive to encourage staff to use public transport, season ticket loans are available.
- Bikes
  For those staff requiring transport for business use, a number of pool bikes are available.

Measure 7: GBC will review the Council's Green Travel Plan, implement the measures and encourage uptake of sustainable modes of transport

Measure 8: GBC will continue to work together with KCC and Groundwork Kent Thameside to encourage the uptake of Employer and School Travel Plans within the Borough

Cycle and Walking Strategies

Regional strategies are in place to improve cycling and walking facilities throughout Kent and increase uptake. The LTP objective for cycling is to triple cycling between 2000 and 2010 (Policy S26). A 2.25% increase in cycling was achieved in 2000/1 – 2001/2, but there is further progress required if the target is to be met. The LTP Objective for walking is to encourage short journeys to be made on foot rather than by car. (Policy S25).
GBC has developed a Cycling Strategy to encourage greater uptake of cycling in the Borough and improve cycle facilities and routes in the Borough. GBC is working with KCC on progress with cycle routes in the area, including the National Cycle Millennium Route No. 1. GBC is also working with KCC and the Groundwork Trust to develop the Green Grid within Gravesham for further enhancement of walking and cycling.

Measure 9: GBC will continue to work with KCC to improve the facilities for cycling and walking within Gravesham and encourage greater uptake.

Parking Strategy

KCC have developed a Parking Strategy for Kent which will be implemented in partnership with the Borough Councils. Maximum parking standards have been established in the KCC Vehicle Parking Standards since 1999. Kent Design urban design guidelines also advocate developments with increased densities and constrained parking provision.

Rail Freight Strategy

The Stage 4 source apportionment for the A2 Trunk Road AQMA identified HGVs as the main contributory vehicle type for NOx and PM_{10} emissions. Improvements are therefore needed to improve the efficiency of freight distribution thus minimising air pollution, and reducing the impact of road based freight on local communities.

Measures are required to encourage industry and business to develop and implement sustainable distribution systems and practices to minimise harm to the environment and human health. The movement of freight is currently dominated by road haulage and therefore the potential for transfer of freight to rail warrant further consideration.

KCC is developing a Rail Freight Strategy in partnership with the Road Haulage Association and rail operators. The objective is to have a Countywide Freight Quality Partnership by 2006 and County Lorry Route Maps are under development.

Measure 10: GBC will work together with KCC to develop Freight quality partnerships and encourage wider uptake of freight by rail

7.5.2 Land Use Planning

Section 4.1 summarises the main policies which were included in the first deposit version of the Gravesham Local Plan Second Review in order to contribute to improvements in air quality. These policies were intended to ensure that developments with the potential to cause environmental impacts were adequately assessed and that where these impacts were judged to be unacceptable, proposals would be refused. However, the policies in the Local Plan Review did not refer specifically to air quality management areas or the impact of building sensitive development adjacent to pollution sources.

As part of work on the second deposit version of the Local Plan Review, it was proposed to make changes to the policies on air quality. However, in view of the Government's proposed reform of the development plan system, it has been decided not to complete work on the Second Review but to transfer to the preparation of a Local Development Framework. As part of this process, existing policies will be revisited. The importance of ensuring that air quality issues are fully taken into account as a material consideration in planning decisions is recognised and it is therefore recommended that the four provisional air quality policies are incorporated into the appropriate Development Plan Document, as part of the Local Development Framework.

Measure 11: GBC Environmental and Public Health Services will continue to work closely with Planning and Regeneration Services Department to ensure that air quality is taken into account in the planning process when located in or close to the AQMA or in areas marginally below air quality objectives.

Land use planning has a key role in delivering sustainable transport systems within the area by influencing the location, scale, density, design and mix of development and encouraging alternative modes of travel.

Measure 12: GBC will continue to work together with developers to improve sustainable transport links serving new developments

To provide support to local plan policies, the development of a supplementary planning document for air quality assessments of developments and, in particular, for development which may impact on an AQMA is recommended in the Policy Guidance LAQM.PG(03).

Measure 13: GBC will develop, through the Kent and Medway Air Quality Partnership, a supplementary planning document to assist with air quality assessments of development proposals

7.5.3 Local Air Quality Management and Pollution Control

Air quality strategy

The development of a local air quality strategy, to provide a framework for ensuring the longer-term commitment and support for air quality issues, is recommended in the Policy Guidance LAQM.PG(03).

The Strategy would incorporate a wider remit than the Final Action Plan, allowing related policy areas to be incorporated, such as climate change, in addition to consideration of non-transport and transboundary sources. Links can be made to other strategies and policy areas such as the Community Strategy and KCC Environment Strategy. The aim would be to ensure that air quality is considered across all GBC activities and to encourage others to adopt positive actions to improving local air quality.

Measure 14: GBC will consider the development of a local air quality strategy to provide a framework for ensuring long-term commitment and support for air quality issues.

Air quality monitoring

The air quality monitoring network in GBC provides more accurate information and understanding of air quality within the Borough. Continuous monitoring stations are installed within the A2 Trunk Road AQMA and adjacent to the Northfleet Industrial Area AQMA to monitor NO_2 and PM_{10} concentrations so that modelled predictions can be verified and the progression of Final Action Plan measures can be monitored and assessed. This is supplemented by NO_2 passive diffusion tubes at thirty sites throughout the Borough. GBC is also part of the Kent and Medway Air Quality Monitoring Network, which was set up in 1997 and provides information on a wide range of pollutants through the County.

Measure 15: GBC will continue their commitment to local air quality monitoring within the Borough to ensure a high standard of data is achieved to assess against air quality objectives

Promotion and Education

It is important that information on air quality is provided in a clear and accessible way. The Council website is currently being upgraded and is due to be launched later this year. The new web site will have much more detail on air quality within the Borough and summaries of LAQM Review and Assessment Reports will be available for viewing.

Measure 16: GBC will make details of the Final Action Plan measures and annual progress reports available on the Website to ensure broad access to the consultation and implementation process.

GBC took part in the European initiative ‘In Town, Without My Car’ (held annually in September) in 2002 to promote reduced car usage and uptake of alternative modes of transport. This was a successful voluntary initiative which raised awareness of the impact of road traffic emissions. GBC has also undertaken voluntary vehicle emissions testing in local supermarkets to promote improved maintenance of vehicles. While, such voluntary

promotional initiatives are likely to be considered in the future, it is unlikely that local authority powers to enforce roadside emissions testing will be taken up. The A2 Trunk Road AQMA is attributed to through traffic emissions, rather than local traffic, and therefore local road emissions testing is not considered to be a cost-effective option (~£1300/day).

GBC is a member of the Kent and Medway Air Quality Partnership, which was formed in 1992. The members of the Partnership are shown below.

The major aims and objectives of the Partnership are:

- To facilitate a co-ordinated approach throughout Kent and Medway to the Local Air Quality Management (LAQM) obligations placed on local authorities under the Environment Act 1995.
- To compile, update and maintain an Emissions Inventory of air pollution sources in and around Kent, to assist with the LAQM process.
- To comment on and influence the economic, planning and transport policies within the county so that air quality issues are properly considered and dealt with.
- To gain an understanding of the health implications associated with poor air quality and the extent to which air quality threatens the health of Kent and Medway's communities.
- To work with national agencies, neighbouring authorities and European partners to promote an awareness of air quality issues and to participate in joint initiatives to further the knowledge and understanding of air quality issues.
- Liaise with DEFRA and government bodies to assist with the implementation of the National Air Quality Strategy.

Measure 17: GBC will continue to work together with KCC and the Kent and Medway Air Quality Partnership on promotional activities to raise the profile of air quality in Gravesham

Pollution Control

Prescribed Industrial Processes are regulated by GBC and the Environment Agency under the Environmental Protection Act 1990 Part I A & B and subsequent Pollution Prevention and Control Act 1999. There are 31 prescribed B Processes in Gravesham regulated by GBC and three A1 Processes regulated by the Environment Agency.

With regard to nuisance emissions from unregulated processes, Statutory Nuisance is enforced by Environmental and Public Health Services under the Environmental Protection Act 1990 Part III and this controls smoke, dust, fumes or gas emissions from commercial and domestic premises which are causing a nuisance or are prejudicial to health. Bonfire leaflets have been produced and these are distributed when nuisance smoke problems arise.

Smoke Control Areas

The majority of GBC urban area north of the A2 is within a Smoke Control Area and therefore emissions from domestic chimneys are controlled by requiring people to burn only smokeless fuel. This is enforced by GBC Environmental and Public Health Services under the Clean Air Act 1993. Northfleet Industrial Area does not currently fall within this area and therefore consideration should be made of designation of the whole urban area north of the A2 to ensure consistency in the approach to enforcement and reduce potential smoke emissions from domestic sources in the Northfleet Area.

7.5.4 Energy Management

Commercial Energy Use

GBC has a Green Housekeeping Policy which includes measures to reduce energy consumption in all its buildings, in addition to LA21 Action Plan measures to determine a practical energy efficiency target for the Council. A number of measures to increase energy efficiency in Council buildings have been undertaken, including an ongoing programme to replace light fittings with more energy efficient fittings and the purchase of ‘green electricity’ renewable energy. Staff are encouraged to adopt energy efficient practices at work by ensuring lighting and appliances are not left on necessarily and the installation of movement sensors is being considered in parts of the building less utilised so that lighting will be automatically be switched off.

Domestic energy use

GBC are working in partnership with the Kent Energy Centre to promote increased energy efficiency in residential properties in the Borough. An annual Home Energy Survey is sent to residents; with advisory leaflets on help available e.g. grant schemes. The energy savings can be calculated on a 12 monthly basis and includes the likely costs of improvement works to residents. GBC also have a planned maintenance programme for Council housing stock to increase energy efficiency.

The Kent Energy Centre is co-ordinating the implementation of the Kent Health & Affordable Warmth Strategy (2001) on behalf of all Kent local authorities including GBC which aims to tackle fuel poverty and promote energy efficiency measures. GBC has also launched the Coldbusters Scheme (2002) targeting grant assistance at the most vulnerable sectors of the community likely to suffer fuel poverty. All these measures will lead to improvements in domestic energy efficiency throughout the Borough.

Building Control

Building Control can contribute to the development of policies for air quality improvement through the promotion of emission-reducing technologies in new developments and buildings. The Council's Building Control Service (Part of the Community Services Directorate) has policies in place to improve energy efficiency in buildings, as described below.

The Building Control Service has a statutory responsibility to ensure that new building works within the Borough meet minimum technical standards in relation to health, safety, welfare and energy conservation, as prescribed under the Building Regulations 1991. The Legislation sets out substantive requirements and technical guidance to achieve minimum standards. This technical guidance is contained in Approved Documents giving general guidance as well as practical guidance about some of the ways of meeting the requirements of the Regulations. Approved Document L, "Conservation of Fuel and Power" requires reasonable provision to be made for the conservation of fuel and power in buildings by:

- limiting the heat loss through the fabric of the building;
- controlling the operation of the space heating and hot water systems;
- limiting the heat loss from hot water vessels and hot water service pipe work;
- limiting the heat loss from hot water pipes and hot air ducts used for space heating; and
- installing in buildings artificial lighting systems, which are designed and constructed, to use no more fuel and power than is reasonable in the circumstances and making reasonable provision for controlling such systems.

Revisions to this document were introduced in April 2002. The key changes are:

- much more stringent requirements with regard to the thermal insulation of all building elements;
- new requirements in respect of controls, boilers and lighting;
- a separation of requirements in respect of domestic and commercial buildings; and with effect from October 2002, the testing of structures for air leakage.

Measure 18: GBC will continue to work together with the Kent Energy Centre to promote and implement energy efficiency measures in Gravesham

7.5.5 Planting of trees beneficial to Air Quality

Tree planting in urban areas can enhance air quality by absorbing gases and particles from the atmosphere, thus reducing the concentrations of pollutants in the air. Careful consideration must be given to location, type of tree, density and growth rate. The use of particular trees may worsen air quality.

Measure 19: GBC will encourage the planting of trees which benefit air quality within the borough through the planning process, Gravesham's Open Space Strategy and green initiative partnerships.

7.5.6 Advice and Advocacy Role

Measure 20: GBC will provide advice and pursue an advocacy role to assist in minimising the effects of poor air quality in public buildings.

A summary of the proposed indirect Borough-wide measures to improve air quality is provided in Table 7.

Table 7 Summary of Proposed Indirect Borough-wide Measures to Improve Air Quality

Proposed measure	Description	Organisation responsible	Date to be achieved by
Measure 1	GBC will work together with the Highways Agency on the consideration of direct options for the A2 Trunk Road.	GBC (P&RS, ES, E&PHS) /Highways Agency	Ongoing
Measure 2	GBC will continue to work closely with Lafarge Cement UK and the Environment Agency to secure the necessary improvements at the Northfleet Works.	GBC (E&PHS) /Lafarge Cement UK/ Environment Agency (EA)	Ongoing 6 monthly meetings scheduled
Measure 3	GBC will continue to work closely with Lafarge Cement UK and the Environment Agency on the relocation timetable.	GBC (E&PHS) /Lafarge Cement UK/ EA	Ongoing until July 2008closure
Measure 4	GBC will work in partnership with local industries in the Northfleet Area to secure improvements in air quality	GBC (E&PHS) /local industries	Ongoing
Measure 5	GBC will ensure that the Final Action Plan measures are co-ordinated with relevant Local Transport Plan (LTP) measures and provide KCC with annual progress reports on air quality.	GBC (P&RS, ES, E&PHS) /KCC	Ongoing
Measure 6	GBC will work together with KCC to improve public transport facilities within Gravesham and develop quality partnerships with transport providers to promote greater uptake of public transport.	GBC (P&RS, ES, E&PHS) /KCC	Ongoing. 2007 - Fastrack
Measure 7	GBC will review the Council's Green Travel Plan, implement the measures and encourage uptake of sustainable modes of transport	GBC	Ongoing
Measure 8	GBC will continue to work together with KCC and Groundwork Kent Thameside to encourage the uptake of Employer and School Travel Plans within Gravesham.	GBC (P&RS, E&PHS) /KCC	Ongoing
Measure 9	GBC will work together with KCC to improve the facilities for cycling and walking within Gravesham and encourage greater uptake.	GBC (P&RS, ES) /KCC	Ongoing
Measure 10	GBC will work together with KCC to develop freight quality partnerships and encourage wider uptake of freight by rail.	GBC /KCC	Ongoing

Table 7 (cont.)

Proposed measure	Description	Organisation responsible	Date to be achieved by
Measure 11	GBC Environmental and Public Health Services will continue to work closely with the Planning and Regeneration Services Department to ensure that air quality is taken into account in the planning process when located in or close to the AQMA or in areas marginally below air quality objectives.	GBC (P&RS, E&PHS)	Ongoing
Measure 12	GBC will continue to work together with developers to improve sustainable transport links serving new developments.	GBC (P&RS, ES, E&PHS)	Ongoing
Measure 13	GBC will develop, through the Kent and Medway Air Quality Partnership, a supplementary planning document to assist with air quality assessments of development proposals	GBC (E&PHS) (P&RS)/KMAQP	Ongoing
Measure 14	GBC will consider the development of a local air quality strategy to provide a framework for ensuring long-term commitment and support for air quality issues	GBC (E&PHS)	Ongoing
Measure 15	GBC will continue their commitment to local air quality monitoring to ensure a high standard of data is achieved to assess against air quality objectives	GBC (E&PHS)	Ongoing
Measure 16	GBC will make details of the Final Action Plan measures and annual progress reports available on the Website to ensure broad access to the consultation and implementation process.	GBC (E&PHS, ITS)	Sept 04 and ongoing
Measure 17	GBC will continue to work together with KCC and the Kent and Medway Air Quality Partnership on promotional activities to raise the profile of air quality in Gravesham	GBC (E&PHS) /KCC/ KMAQP	Ongoing
Measure 18	GBC will continue to work together with the Kent Energy Centre to promote and implement energy efficiency measures in Gravesham	GBC (HS) /KCC	Ongoing
Measure 19	GBC will encourage the planting of trees which benefit air quality within the borough through the planning process, Gravesham's Open Space Strategy and green initiative partnerships.	GBC (P&RS, E&PHS) /KCC/ Groundwork KT	Ongoing
Measure 20	GBC will provide advice and pursue an advocacy role to assist in minimising the effects of poor air quality in public buildings.	GBC/KCC	Ongoing

8 IMPLEMENTATION AND MONITORING

GBC will work jointly on the Final Action Plan measures with the relevant partners including Kent County Council, the Highways Agency, the Environment Agency and local businesses. To make progress towards the necessary air quality improvements there must be involvement by all local stakeholders and GBC will actively work to encourage community participation in the process.

The implementation and effectiveness of the Final Action Plan will be carefully monitored through monitoring of PM_{10} and NO_2 at the A2 roadside site and the industrial background site in Northfleet.

For the A2 Trunk Road AQMA traffic flow changes on the A2 will also be monitored, in addition to the uptake of local measures such as Travel Plans. For the Northfleet Industrial Area AQMA, air quality improvements will also be monitored through site inspections, incidences of dust complaints and enforcement activities. GBC will work in partnership with local businesses to ensure that advice is readily available and best practice is achieved. There will be regular review and assessment of the Final Action Plan proposals to evaluate progress and this will be reported annually.

9 GLOSSARY OF TERMS

Abbreviation	Full name
AQMA	Air Quality Management Area
BAT	Best Available Technology
CTRL	Channel Tunnel Rail Link
DEFRA	Department for Environment, Food and Rural Affairs
DETR	Department for Transport and Regions
DMRB	Design Manual for Roads and Bridges
DOE	Department of the Environment
GBC	Gravesham Borough Council
HDV	Heavy duty vehicles
KCC	Kent County Council
LA21	Local Agenda 21
LAQM	Local Air Quality Management
LTP	Local Transport Plan
NAQS	National Air Quality Strategy
NO_2	Nitrogen dioxide
NOx	Oxides of Nitrogen
NSCA	National Society for Clean Air
PM_{10}	Fine particle matter less than 10μm diameter
ppb	Parts per billion
$\mu g/m^3$	Micrograms per cubic metre

10 REFERENCES

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