NEIGHBOURHOOD SERVICES SCRUTINY FORUM AGENDA

Tuesday, 16 March 2010

at 4.00 pm

in Committee Room B, Civic Centre, Hartlepool

MEMBERS: NEIGHBOURHOOD SERVICES SCRUTINY FORUM

Councillors S Akers-Belcher, Barker, R W Cook, Coward, Fleming, J Marshall, Rogan, Worthy and Wright

Resident Representatives: John Cambridge and Brenda Loynes

Also invited to attend:

The Mayor, Stuart Drummond

Councillors Aiken, C Akers-Belcher, Allison, Atkinson, Brash, S Cook, Cranney, Fenwick, Fleet, Flintoff, Gibbon, Griffin, Hall, Hargreaves, Hill, Jackson, James, Laffey, Lauderdale, A E Lilley, G Lilley, London, A Marshall, McKenna, Dr Morris, Payne, Plant, Preece, Richardson, Shaw, Simmons, Sutheran, Thompson, Tumilty, Turner, Wallace, Wistow, Young

Resident Representatives: Christine Blakey, Ronald Breward, Liz Carroll, Bob Farrow, Mary Green, Ray Harriman, Ted Jackson, Jean Kennedy, Rose Kennedy, Evelyn Leck, Alan Lloyd, John Lynch, Brian McBean, Mary Power, Julie Rudge, Iris Ryder, Linda Shields, Bob Steel, Joan Steel, Sally Vokes and Maureen Waller

1. APOLOGIES FOR ABSENCE

2. TO RECEIVE ANY DECLARATIONS OF INTEREST BY MEMBERS

3. MINUTES

3.1 To confirm the minutes of the meeting held on 1 March 2010 *(to follow)*

4. RESPONSES FROM THE COUNCIL, THE EXECUTIVE OR COMMITTEES OF THE COUNCIL TO FINAL REPORTS OF THIS FORUM

No items

5. CONSIDERATION OF REQUEST FOR SCRUTINY REVIEWS REFERRED VIA SCRUTINY CO-ORDINATING COMMITTEE

No items

6. CONSIDERATION OF PROGRESS REPORTS/BUDGET AND POLICY FRAMEWORK DOCUMENTS

No items

7. ITEMS FOR DISCUSSION

Investigation into the Possible Environmental Impacts of Dust Deposits on the Headland and Surrounding Areas

7.1 Evidence from key groups:-

(a) Covering Report – *Scrutiny Support Officer;* and

(b) Evidence from:-

(i) Van Dalen;

(ii) PD Ports;

(iii) Heerema; and

(iv) the Regeneration and Neighbourhoods Department

7.2 Feedback from the site visit held on 19th February 2010, the observations of ships from the Town Wall, the visits to properties on the Headland and the Focus Group held on 23rd February 2010:-

(a) Covering Report – *Scrutiny Support Officer*

(b) Verbal Feedback from the:-

(i) site visit held on 19th February 2010;

(ii) observations of ships from the Town Wall;

(iii) visits to properties on the Headland; and

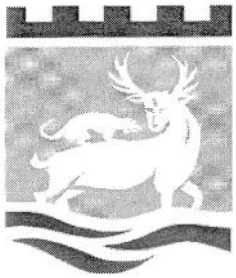
(iv) Focus Group held on 23rd February 2010

8. ISSUES IDENTIFIED FROM FORWARD PLAN

9. ANY OTHER ITEMS WHICH THE CHAIRMAN CONSIDERS ARE URGENT

ITEMS FOR INFORMATION

Date of Next Meeting:- Tuesday, 23 March 2010 at 2.00 pm in the Council Chamber, Civic Centre, Hartlepool



HARTLEPOOL BOROUGH COUNCIL

REVIEW AND ASSESSMENT OF AIR QUALITY 2003

UPDATING and SCREENING REPORT

PUBLISHED BY HARTLEPOOL BOROUGH COUNCIL - MAY 2003

CONTENTS

Review and Assessment of Air Quality 2003

SUMMARY of Updating and Screening Report

This report is the second in the series of air quality Review and Assessments carried out in the Hartlepool Borough Council area under the Environment Act 1995.
The first, Review and Assessment of Air Quality 2000, was submitted to Government in December 2000, and was based on a comprehensive review of pollutant emission and monitoring data between 1996 and 1999. The report concluded that air quality in the Hartlepool Council area, judged against Government objectives, was generally good, and there was no need to declare any Air Quality Management Areas.
This second Review and Assessment is an Updating and Screening process, recording significant emission data changes to the end of 2001 / 2002, updating monitoring data to end 2002, and identifying any areas of concern where further, more detailed, analysis is required.

Government objectives for air quality currently cover seven pollutants:

- Nitrogen dioxide
- Particulate PM10
- Sulphur dioxide
- Carbon monoxide
- Benzene
- 1,3-butadiene
- Lead

The main sources of these pollutants are domestic / commercial heating emissions, road traffic fuel and exhaust emissions, and industrial combustion and process emissions.
Within the Hartlepool Council area, domestic / commercial heating is largely fuelled by natural gas, which gives low levels of emissions compared with other carbon based fuels. There are 12 large industrial processes within the Council area, and many more in the Tees Valley Council areas to the South. This is, however, no significant change over the earlier detailed review, and none have been found to have a major impact on ground level pollutant concentrations. It is road traffic fuel and exhaust emissions that remain the largest source of air pollution at ground level.

While, in general, improved fuels, engines, and exhaust systems are having a major impact on reducing road traffic emissions, the sheer volume of traffic and low point of discharge can still give rise to high kerbside concentrations of nitrogen dioxide and particulate PM10. This is particularly so where there are very heavily congested roads with tall buildings creating a 'canyon' effect and limiting dispersal, such as can be found in older city centres. The Hartlepool Council area does not have roads of this type, even in the main urban area of Hartlepool town. Buildings are generally low level, and set back from the roadside. New commercial development is in the marina area, to the North and East of the old town. While the busy main A689 / A179 route acts as the main through-route and feeder to the old town and the new developments, it now runs well away from potential target group areas. The north – south A19 trunk road passes well to the west of the town, through rural areas.

Government guidance shows that the road traffic emission factors for the first Review and Assessment have been too optimistic, and understated emissions by around 10 %. However, the updated traffic flow forecasts show lower levels of traffic on many of the urban roads. Overall, the extensive modelling work carried out for the first review and assessment is still likely to be a fair representation of future air quality, with no exceedances of objectives shown.

Most importantly, continuous monitoring carried out within the Hartlepool Council area has shown that there is no exceedance of government objectives from traffic or from industry. Further support is provided by the results from continuous monitoring carried out elsewhere in the Tees Valley area.

It is concluded that all Government objectives will be met by the due date within the Hartlepool Council area, and there is no need to declare any Air Quality Management areas.

The proposed particulate PM10 objectives for 2010 are, however less certain to be met without significant reductions in particulate emissions. In view of this, and on-going concern about transport-related emissions, discretionary modelling of certain road areas with slow moving traffic and a higher than average bus flow will be carried out for PM10 and nitrogen dioxide, and reported as a separate study.

1. INTRODUCTION TO LOCAL AIR QUALITY MANAGEMENT

LAQM

The National Environment Act 1995, and subsequent regulations, has required local authorities to review and assess air quality in their area from time to time, against a range of air quality objectives. If the review and assessment process shows that an objective is unlikely to be met by the due date, local authorities are obliged to declare an Air Quality Management Area (AQMA), and prepare an action plan to reduce air pollution within the defined area. This process of review and assessment and subsequent action is Local Air Quality Management (LAQM).

LAQM covers seven air pollutants as shown below, but further air pollutants will be added in the future.

Review and assessment will be carried out to a three year timetable. The first, and most detailed, review and assessment was required for December 2000. Subsequent reviews and assessments are in a more simplified form as an updating and screening report for end May 2003 (then 2006 and 2009), with any more detailed work to be completed by end May 2004 (2007 and 2010).

Pollutant Objectives

Pollutant	Objective	Due Date
Nitrogen Dioxide	1. 40 µg/m³ as an annual mean, with no exceedances	31.12.2005
	2. 200 µg/m³ as a 1 hour mean, with up to 18 exceedances	31.12.2005
Particulate PM10 (gravimetric)	1. 40 µg/m³ (g) as an annual mean, with no exceedances	31.12.2004
	2. 50 µg/m³ (g) as a 24 hour mean, with up to 35 exceedances	31.12.2004
	two further particulate PM10 objectives are proposed (but not yet regulated) for 2010 :	
	3. 20 µg/m³ (g)as an annual mean, with no exceedances	31.12.2010
	4. 50 µg/m³ (g) as a 24 hour mean, with up to 7 exceedances	31.12.2010
Sulphur Dioxide	1. 125 µg/m³ as a 24 hour mean, with up to three exceedances	31.12 2004
	2. 350 µg/m³ as a 1 hour mean, with up to 24 exceedances	31.12.2004
	3. 266 µg/m³ as a 15 minute mean, with up to 35 exceedances	31.12.2005
Carbon Monoxide	1. 10.0 mg/m³ as an 8 hour running mean, with no exceedances	31.12.2003
Benzene	1. 16.25 µg/m³ as a running annual mean, with no exceedances	31.12.2003
	2. 5.00 µg/m³ as an annual mean, with no exceedances	31.12.2010
1,3-Butadiene	1. 2.25 µg/m³ as a running annual mean, with no exceedances	31.12.2003
Lead	1. 0.5 µg/m³ as an annual mean, with no exceedances	31.12.2004
	2. 0.25 µg/m³ as an annual mean, with no exceedances	31.12.2008

Future Pollutants

Pollutants under consideration within the EU and UK are Ozone, Cadmium, Arsenic, Nickel, Mercury, and Polycyclic Aromatic Hydrocarbons (PAHs). These are not part of this 2003 Review and Assessment.

Target Groups

The air quality objectives only apply to areas where target group members of the public are likely to be present. The definition of these depends on the averaging period of the objective, with a short 15 minute averaging period affecting a wider range of the public than an annual average.

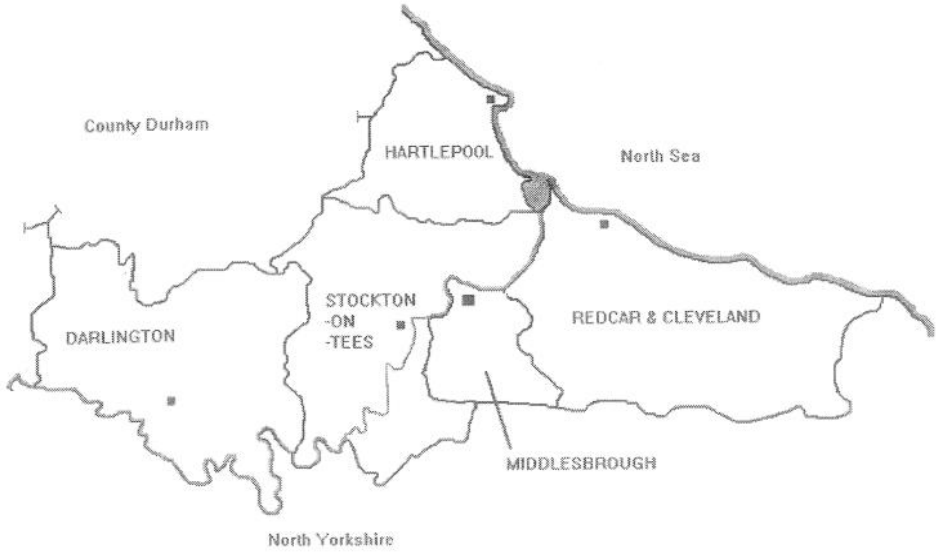
Government guidance is as follows

Averaging Period	Objectives should apply at :	Objectives should generally not apply at :
Annual Mean	All locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, libraries etc.	Building facades of offices or other places of work where members of the public do not have regular access. Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location is expected to be short term.
24 hour mean and 8 hour mean	All locations where the annual mean objective would apply. Gardens of residential properties, in particular around seating or play areas.	Kerbside sites (as opposed to locations at the building façade), or any other location is expected to be short term.
1 hour mean	All locations where the annual mean and 24 hour and 8 hour mean objectives would apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc., which are not fully enclosed, where the public might reasonably be expected to spend 1 hour or more. Any outdoor locations to which the public might reasonably be expected to spend 1 hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15 minute mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	

2. HARTLEPOOL BOROUGH COUNCIL BACKGROUND

Hartlepool Council area

Hartlepool Borough Council is one of five unitary Councils forming the general area known as the Tees Valley. As shown below, it is the most northerly of these Councils, and is fourth largest in area, with a long coastline to the East.



Hartlepool Borough has a densely populated area to the East, but is otherwise largely rural. It has a covered shopping centre in the older part of the town, but most new commercial development is around the marina area, nearer the coast. There is no significant rail traffic, and the port area is relatively small compared with the Tees to the South. There are a number of large industrial processes within the Council area, but many more are located in other Tees Valley Councils to the South. They do not significantly impact on Hartlepool air quality.

The main A19 trunk road runs North / South through the Borough, but is mainly in rural areas. Within the urban area, A689 / A179 dual carriageway runs North / South nearer to the coast, past the town centre and marina development.

The majority of the Hartlepool area is subject to Smoke Control Orders, and natural gas is the main source of heating in all but a few rural villages. This means that air pollution from domestic and commercial sources are low. Industrial emissions are also low, leaving road transport as the most significant air pollution source.

Tees Valley Environmental Protection Group

The Tees Valley Environmental Protection Group (TVEPG) is a joint committee of the five Tees Valley Councils which looks at a range of environmental issues of mutual concern. Air pollution matters are an important part of the work of the Group, drawing together a better understanding of the sources of pollutants, and their impact across the Tees Valley.

There is a wide range of air pollution monitoring carried out between the five Councils. This data is collated and published annually, and forms a key part of review and assessment for each of the Councils.

Of the five Councils, Hartlepool is one of the two which are coastal. There are significant areas of light industry, but relatively little heavy industry. Air quality in Hartlepool is therefore a measure of emissions from domestic, light industry and road traffic sources, and provides an indication of coastal influences on air pollution.

Hartlepool 2000 Review and Assessment

Stage 1 of the first Review and Assessment was a joint report published by the TVEPG in December 1998. A more detailed 2nd / 3rd stage Review and Assessment, which included work from consultants commissioned to undertake advanced air quality modelling (AAQuIRE 2000), was published by Hartlepool Council in December 2000. This confirmed that road traffic was the main source of air pollution at ground level in the form of nitrogen dioxide and particulate PM10, but that there was no need to declare any Air Quality Management Areas. The report was accepted in full by the Department for Environment, Food and Rural Affairs (Defra).

Principal Changes for 2003 Review and Assessment

There has been no significant change to domestic, commercial or industrial sources within, or close to the Hartlepool Council area.

Road traffic flows have been updated and extended, based on 2001 / 2002 traffic count data, and projected forward using the latest traffic growth factors (Appendix 2). Where a direct comparison is possible, forecast traffic flows show a reduction for many of the urban roads compared with the first Review and Assessment, and there are no areas identified of particular concern.

The projected emission factors for traffic provided by Defra have changed, and are less optimistic than earlier thought by around 10%. It is unlikely that this will cause any areas of Hartlepool to show any exceedance of objectives, particularly with reduced forecast traffic flows.

Pollutant Monitoring Update

A continuous monitor for nitrogen dioxide, particulate PM10, sulphur dioxide and carbon monoxide has been located in the Seaton Carew suburb since year 2000. This is a coastal location and is positioned to detect emissions from industrial sources within the Council area, and from the larger industrial complexes in neighbouring Council areas to the South. Hartlepool has also shared a mobile continuous monitor with three other Tees Valley councils since 1999, and to the end of 2002, the monitor has been sited at two locations for 3 to 6 month periods.

Monitoring Data Ratification and Validation

The Hartlepool fixed continuous monitoring station (NOx, PM10, SO2 CO), and the jointly owned mobile continuous monitoring station (NOx, PM10, SO2, CO) are modern installations, operated under a comprehensive service contract with the supplier, in both cases Casella. Operators of the site have received supplier training.

The Council is committed to achieving accuracy, precision, data capture, traceability and long term consistency to ensure that data is representative of ambient air quality. In common with other Tees Valley Councils, Hartlepool has a documented quality assurance and control programme, which includes an established schedule of regular site calibrations, validation of data, and documentation of all procedures. Details are summarised as follows:

Calibration	daily 'automatic' calibration with frequent (usually fortnightly) manual checks. Calibration gas obtained from approved gas standard suppliers.
Equipment	comprehensive service agreement with the supplier.
Data capture	site operators are experienced and trained personnel, monitoring data capture on a daily basis where possible to ensure that faults are detected and corrected quickly.

Monitoring Data Ratification and Validation
(continued)

Data Processing	Appropriate zero and span calibration factors are applied automatically on-site, with regular manual checks.
Ratification	data is screened, where possible on a daily basis, to check for unusual measurements. Suspicious data is investigated fully, and if found to be faulty, is deleted from the records. Particular attention is paid to possible environmental changes in the vicinity of the analyser. Data is recorded monthly and compared with earlier results. Data is collated quarterly with that from other monitors within the Tees Valley, including AURN stations, as a further check on accuracy. All data is published annually (reference 1) by the Tees Valley Environmental Protection Group.

The Hartlepool nitrogen dioxide diffusion tube programme is operated through an approved laboratory with formal accreditation to BS standards, and one that participates in the WASP programme. Particular attention is paid to proper installation of the tubes at the site, and reliable exposure duration. From time-to-time, a limited validation alongside an automatic analyser is carried out. Diffusion tube data is only used to identify hot-spots for siting the mobile continuous monitor.

3. POLLUTANT UPDATING and SCREENING PROCESS 2003

Report Format	This report will look at each of the seven air pollutants in sections 4 to 10, under the following headings :
Objectives	A statement of the objectives, and any new proposals for the pollutant.
Overview	A general assessment of the sources of the pollutant.
Year 2000 R & A	A summary of the conclusions for the pollutant in the year 2000 R & A.
Monitoring Data	A record of monitoring data from within the Hartlepool area, and neighbouring Council areas where relevant. Monitoring data is seen as the most important factor in delivering LAQM, and wherever possible is ratified to standards in Government guidance, as recorded in reference 1.
Background Concentrations	For most of the pollutants, Defra issue an estimate of expected concentrations in each square kilometre grid of the Council area. This is based on the National Emissions Database for 2001, and is a guide to possible areas of objective exceedance.
Road Traffic	This looks at the likely impact of road traffic on pollutant concentrations.
Other Traffic	This looks at the likely impact of other transport forms such as rail and sea.
Part B Processes	This looks at the likely impact of small industrial processes regulated by Hartlepool Borough Council.
Part A Processes	This looks at the likely impact of large industrial processes regulated by the Environment Agency.
Other Emitters	This covers any other significant sources not included above.
Conclusion	This will record whether air quality objectives will be met, and the extent to which further work will be required.

NITROGEN DIOXIDE

Objectives

1. Maximum 40 µg/m³ as an annual mean with no exceedances, by December 2005
2. Maximum 200 µg/m³ as a 1 hour mean with up to 18 exceedances, by December 2005

These objectives are provisional, but are equivalent to EU limit values, which are to be achieved by 2010.

Overview

The main source of nitrogen dioxide pollution at ground level in the Hartlepool Council area is from road traffic. Natural gas is readily available for domestic, commercial and some industrial use, and contributes to low background concentrations. Industrial sources in neighbouring Council areas to the South are major emitters, but comprehensive monitoring has shown industrial sources to have minimal impact at ground-level.

Year 2000 R & A

3rd stage Review & Assessment was required to evaluate the extent to which nitrogen dioxide emissions relating to road traffic, affected target groups. Monitoring and modelling work showed that there was no need to declare an Air Quality Management Area.

Monitoring Data
(Reference 1)

A Local continuous monitoring station has been located near the coast at Seaton Carew since July 2000, to the North of the major industrial sources of nitrogen dioxide.

Hartlepool (Seaton Carew) ratified full year data is as follows, all in µg/m³

	2002	2001	2000	Objective
annual mean	16	20	-	40
max 1 hour (exceedances)	82 (0)	93 (0)	-	200 (18)
99.8th percentile	63	68	-	200

There have been no exceedances recorded at this station, with concentrations well below the National objectives.

A mobile continuous monitoring station has also been used to monitor concentrations alongside the main trunk road into Hartlepool centre over 3 months, and at a background location downwind of an industrial source over 6 months. Results are as follows, all in µg/m³

	Period Mean	1 hour max (exceedances)
Objective	40	200 (18) – 99.8th %ile = 200
Stockton Road (Q3 1999)	25	91 (0)
Headland (H1 2001)	19	86 (0) – 99.8th %ile = 72

Concentrations at both locations are well below National objectives.

Hartlepool also have a nitrogen dioxide diffusion tube monitoring programme for measuring annual mean concentrations at seven locations, three of which are part of the National (N) programme. Results are as follows, all in µg/m³,

Monitoring Data (continued)

Objective 40 µg/m³	2002	2001	2000
Victoria Road (N roadside)	35	34	34
Granville Ave (N Background)	22	21	21
Torquay Ave (N Background)	20	29	21
Duke St/ Hart Lane (Kerbside)	22	34	-
Stockton Street (Kerbside)	40	46	38
Owton Manor Lane (Kerbside)	35	31	28

The Stockton Street kerbside diffusion tube is located at the busiest town centre traffic-light controlled junction, and clearly demonstrates the traffic influence on ground-level nitrogen dioxide levels. Diffusion tube readings tend to be high compared with continuous monitors, but in any event, there are no target groups present in this area.

There are three relevant AURN continuous monitoring stations are situated in the neighbouring Council areas of Middlesbrough, Redcar & Cleveland, and Stockton-on-Tees, to the South of Hartlepool. The Middlesbrough and Redcar & Cleveland stations are close to the main industrial areas, with the Redcar & Cleveland station more on a prevailing wind direction. The Stockton-on-Tees (Yarm) station is a roadside station on a congested town centre High street.

Middlesbrough (Breckon Hill) AURN station ratified full year data is as follows, all in µg/m³

	2002	2001	2000	Objective
annual mean	26	25	24	40
max 1 hour (exceedances)	112 (0)	258 (1)	112 (0)	200 (18)
99.8th percentile	84	95	80	200

This is an urban industrial site, surrounded by busy town centre roads, and will be reflective of the maximum concentrations likely to be seen in Hartlepool. Although there is an occasional exceedance at the 1 hour level, 99.8th percentiles are consistently below the objective level.

Redcar & Cleveland AURN station ratified full year data is as follows, all in µg/m³

	2002	2001	2000	Objective
annual mean	22	24	21	40
max 1 hour (exceedances)	116 (0)	131 (0)	89 (0)	200 (18)
99.8th percentile	80	86	70	200

This is a suburban site, downwind of some major industrial emitters, and close to the coast. As with Hartlepool, road traffic levels are relatively low, and these results will better reflect nitrogen dioxide cocentrations likely to be found in Hartlepool. Again, well below the objective levels.

Stockton-on-Tees (Yarm) AURN station ratified full year data is as follows, all in µg/m³

	2002	2001	2000	Objective
annual mean	38	39	34	40
max 1 hour (exceedances)	285 (1)	171 (0)	196 (0)	200 (18)
99.8th percentile	120	131	118	200

This is a kerbside site, and is included to show the effect of traffic in a busy, but slow moving

Monitoring Data (continued)

town centre High street. There are no similar locations within Hartlepool.

A further three relevant Local continuous monitoring stations are located in the neighbouring Council areas of Middlesbrough and Darlington. All three record concentrations close to busy roads, and give further indication of levels likely to be found in Hartlepool.

Middlesbrough (MacMillan College) Local station ratified full year data is as follows, all in µg/m³

	2002	2001	2000	Objective
annual mean	25	28	24	40
max 1 hour (exceedances)	175 (0)	143 (0)	135 (0)	200 (18)
99.8th percentile	93	103	72	200

This site is at a target group location, and is relatively close to the busiest trunk routes in the Tees Valley. It is unlikely that any target group location in Hartlepool will see concentrations as high as these levels, which are still comfortably below National objectives.

Middlesbrough (Elm Street) Local station ratified full year data is as follows, all in µg/m³

	2002	2001	2000	Objective
annual mean	32	31	-	40
max 1 hour (exceedances)	135 (0)	190 (0)	-	200 (18)
99.8th percentile	93	95	-	200

This is a town centre roadside location with slow moving, and is likely to reflect a worst case site off the main A689 in central Hartlepool. The annual means and 99.8th percentiles remain comfortably within the objective levels.

Darlington (St Cuthbert's Way) Local station ratified full year data is as follows, all in µg/m³

	2002	2001	2000	Objective
annual mean	35	36	-	40
max 1 hour (exceedances)	167 (0)	118 (0)	-	200 (18)
99.8th percentile	95	95	-	200

This station is at a busy roundabout on the inner ring road. It is likely to reflect a worst case junction on the main A689 in central Hartlepool. Again, the results confirm the impact of slow moving traffic on annual means, but there are no target groups at this type of location. The 1 hour means are well within the objective level.

Overall, the monitoring data shows no sign of traffic related emissions of nitrogen dioxide falling, despite improving engine and exhaust technology. The comprehensive monitoring data available in the Tees Valley area shows that the National objectives are unlikely to be exceeded within the Hartlepool Council area either now, in 2005, or in 2010.

As traffic is clearly the main concern for nitrogen dioxide pollution, further discretionary screening work at selected target group areas will be carried out over 2003 using the DMRB screening model, and the AAQuiRE air quality model, and reported as a separate study.

Background Concentrations (Appendix 1)

Nationally derived background concentrations of nitrogen dioxide as an annual mean for each square kilometre grid across the Council area for 2001, with projections for 2005 and 2010, are as follows :

	2001	2005	2010
maximum µg/m³	28.7	29.2	23.3
minimum µg/m³	20.5	18.8	15.7

These show that the National annual mean objective is comfortably met, and supports monitoring data.

Road Traffic (Appendix 2)

Road traffic is the major source of nitrogen dioxide at ground-level. Hartlepool does not have high traffic flows, and there are no road areas with 'canyon' effect. Housing and other target group areas such as schools and hospitals tend to be set well back from the roadside, particularly on the main trunk roads.

There are no major road changes proposed over the next ten years, but the main A689 route through the town centre area has been diverted since the 2000 Review & Assessment as part of the Harbour redevelopment. This has improved traffic flow, and reduced congestion in parts of the old town areas.

Hartlepool does not have any narrow and congested streets with residential properties close to the kerb. In addition there are no busy streets identified where people may spend more than 1 hour or more close to traffic.

There is no bus station as such, and some roads close to the town centre have a high proportion of buses. Other road traffic is relatively low, and residential areas are set well back from the roadside.

Consultants CES (now Faber-Maunsell) carried out detailed modelling of the road system in and around Hartlepool for the 1st (2000) Review and Assessment, using the AAQuiRE air quality model. This showed that, at a few short sections of the main A689 route into the town centre, there was likely to be an exceedance of the annual average nitrogen dioxide objective of 40 µg/m³ by 2005. No target groups were identified in the vicinity of these locations, and there was no need to declare Air Quality Management Areas. The modelling showed that there was no exceedance of the hourly mean, with the 99.8th percentile well below the objective level of 200 µg/m³.

Traffic flow projections have been updated based on 2001/2002 traffic count data, projected forward using the latest TEMPRO factors, and are shown in Appendix 2. Where a direct comparison is possible, a number of town centre roads show a decrease over earlier projections, and need no further consideration. The northern access route, the A179, from the A19 trunk road towards the town centre, is showing a significant increase over earlier projections, but this road runs well away from target group areas and needs no further consideration. Other roads that show an increase in traffic have traffic flows that remain well below those in other areas, and which are known to be below the objective levels. They also need no further consideration.

The extensive monitoring results given earlier have shown that there are no roadside areas within the Hartlepool Council area that have exceeded 40 µg/m³ as an annual mean in 2002. No

Road Traffic (continued)

target groups are present at this location, and it can be seen as a worst case example.

Technical guidance factors (Page 6-29) show that this highest level can be expected to fall to 36 $\mu g/m^3$ by 2005, and 30 $\mu g/m^3$ by 2010, comfortably below the annual mean objective of 40 $\mu g/m^3$, even where no target groups are present.

This analysis shows that the 2005 objectives for nitrogen dioxide will be met in all areas, and easily met where target groups may be present. However, road traffic is the major source of nitrogen dioxide pollution at ground level, and there is an on going need to further investigate nitrogen dioxide emissions from traffic. Roads within the Hartlepool town centre with the highest traffic flows and / or high heavy goods vehicle and bus flows, will included in more detailed discretionary modelling work using the DMRB screening model, and the AAQuiRE air quality model. The results will be reported as a separate study.

Other Transport

The coastal rail route from Stockton to Sunderland passes through Hartlepool. Although diesel operated, traffic is light and not considered a significant nitrogen dioxide source.
The Hartlepool port also has light traffic and is not considered a significant source.

Part B Processes (Appendix 3)

There are 20 part B small industrial processes and 11 petrol stations registered within the Council area, but none are noted as significant sources of nitrogen dioxide.

Part A Processes (Appendix 4)

There are 12 part A industrial processes within the Council area, all of which are relatively low emitters of nitrogen oxides. There are also a number of large nitrogen oxide emitters located in the neighbouring Council areas of Redcar & Cleveland and Stockton-on-Tees to the South. Detailed analysis of all monitoring data at the year 2000 R & A across the whole of the Tees Valley showed that industrial emissions had minimal impact on ground-level concentrations of nitrogen dioxide, and this was confirmed by comprehensive modelling work. In particular, the Hartlepool Council area is too far away from the major industrial emitters for any impact to be noted.
Industrial emissions have not increased over the last five years, and with the comprehensive monitoring of nitrogen dioxide across the region, it is not considered necessary to carry out further investigation on industrial emissions within the Hartlepool Council area.

Other Emitters

No other significant emission sources have been identified.

Conclusion

Nitrogen dioxide concentrations across the Hartlepool Council area are, and will continue to be, below the national air quality objectives. As road traffic is identified as the major source of ground-level concentrations of nitrogen dioxide, a more detailed assessment of certain road areas with slow moving traffic and a higher than average bus flow, will be carried out as a discretionary separate study.

PARTICULATE PM10

Objectives

1. Maximum 40 µg/m³ (g)* as an annual mean with no exceedances, by December 2004
2. Maximum 50 µg/m³ (g)* as a 24 hour mean with up to 35 exceedances, by December 2004

- Note that these values are based on gravimetric (g) measurement.

The Government have published proposals to tighten the objectives further for December 2010, but these are not a formal part of the current Review & Assessment process, and are unlikely to be passed into regulation before 2005.. However, an assessment will be made of the likelihood of these objectives being met. The new objectives are :

3. Maximum 20 µg/m³ (g)* as an annual mean with no exceedances, by December 2010
4. Maximum 50 µg/m³ (g)* as a 24 hour mean with up to 7 exceedances, by December 2010

- Note that these values are based on gravimetric (g) measurement.

Overview

There are a wide variety of sources of particulate PM10, most notably traffic, construction work, industry, quarrying, and all forms of coal burning. There are also natural sources, such as pollen, and near coastal areas, sand and salt. National studies have also shown occasional atmospheric import of particle pollution from the continent.
Within Hartlepool Council area, natural gas is readily available for domestic, commercial and some industrial use, and there is little coal burning. Industrial sources in neighbouring Council areas to the South can be major emitters, but these are normally too far away, and on an infrequent wind direction to have major impact. Road traffic is relatively light, but is likely to be a significant source of ground-level concentrations. The Hartlepool Council area borders the North Sea to the North and East, and around half of the population live within 2.5 km of the coast. During strong easterly winds, which are unlikely to occur more than 10% of the year, it is expected that sand / salt lift-off could be very significant sources of particulate levels.

Year 2000 R & A

3rd stage Review & Assessment was required to evaluate the extent to which particulate Pm10 emissions relating to road traffic and industry affected target groups. Monitoring carried out mainly within neighbouring Council areas, and modelling work, showed that there was no need to declare an Air Quality Management Area.

Monitoring Data
(Reference 1)

All monitoring results included in this section have been obtained using TEOM instruments. The results have been multiplied by the technical guidance factor of 1.3 to estimate the gravimetric equivalent.

A Local continuous monitoring station has been located near the coast at Seaton Carew since July 2000.

Hartlepool Local station ratified full year data is as follows, all in µg/m³ (g)

	2002	2001	2000	Objective
annual mean	26	23	-	40
max 24 hour (exceedances)	87 (26)	138 (12)	-	50 (35)
90th percentile	49	42	-	50

Although the annual mean is well below the current (2004) objective, there are a significant

Monitoring Data (continued)

number of exceedances of the 24 hour objective, and the 90th percentile in 2002 was relatively close to the objective level. Wind vector analysis of the results show that the high levels are invariably noted on a North to East wind direction, and are most likely to be sand / salt lift-off as there is no industry or traffic sources of note.

A mobile continuous monitoring station has also been used to monitor concentrations alongside the main trunk road into Hartlepool centre over 3 months, and at a background location downwind of an industrial source over 6 months. Results are as follows, all in µg/m³ (g)

	period mean	24 hour max (exceedances)	90th percentile
Objective	40	50 (35)	50
Stockton Road (Q3 1999)	20	57 (3)	30
Headland (H1 2001)	24	61 (3)	33

The period mean was similar to that seen over a year at Seaton Carew, but the 24 hour max, exceedances, and 90th percentile were much lower. Wind vector analysis of the results showed again that the highest levels were on a North to East wind direction, confirming the Seaton Carew findings above.

Three relevant AURN continuous monitoring stations are situated in the neighbouring Council areas of Middlesbrough, Redcar & Cleveland, and Stockton-on-Tees to the South of Hartlepool. The Middlesbrough and Redcar & Cleveland stations are close to the main industrial areas, with the Redcar & Cleveland station more on a prevailing wind direction. This station is also within 2 km of the coast, although not as close as the Seaton Carew station. The Stockton-on-Tees (Yarm) station is a roadside station on a congested town centre High street.

Middlesbrough AURN station ratified full year data is as follows, all in µg/m³(g)

	2002	2001	2000	Objective
annual mean	22	21	20	40
max 24 hour (exceedances)	85 (10)	78 (9)	65 (5)	50 (35)
90th percentile	34	33	33	50

This is an urban industrial site, surrounded by busy town centre roads. The site is inland from the coast, and while annual means are similar to those at Seaton Carew, levels of 24 hour maximums, exceedances and the 90th percentile are generally significantly lower.

Redcar & Cleveland AURN station ratified full year data is as follows, all in µg/m³(g)

	2002	2001	2000	Objective
annual mean	22	22	21	40
max 24 hour (exceedances)	62 (9)	68 (5)	65 (3)	50 (35)
90th percentile	35	34	34	50

This is a suburban site, downwind of some major industrial emitters, and within 2 km of the coast. Road traffic levels are relatively low, and while the station is generally downwind of large industrial complexes, it is some distance away. Similarly, the station is more protected from coastal influences than Seaton Carew.

Monitoring Data (continued)

Stockton-on-Tees (Yarm) AURN station ratified full year data is as follows, all in µg/m³(g)

	2002	2001	2000	Objective
annual mean	29	30	-	40
max 24 hour (exceedances)	77 (1)	83 (0)	-	50 (35)
90th percentile	43	42	-	50

This is a kerbside site, and is included to show the effect of traffic in a busy, but slow moving town centre High street. The site is inland, and is not significantly influenced by industry. The results show the extent to which traffic can elevate particulate PM10 concentrations, although the 24 hour maximums have not been as high as those at Seaton Carew. There are no similar locations within Hartlepool.

A further two relevant Local continuous monitoring stations are located in the neighbouring Council areas of Middlesbrough, and Darlington. Both record concentrations close to busy roads.

Middlesbrough (MacMillan College) ratified full year data is as follows, all in µg/m³(g)

	2002	2001	2000	Objective
annual mean	22	21	20	40
max 24 hour (exceedances)	73 (7)	61 (3)	56 (2)	50 (35)
90th percentile	34	35	31	50

This site is at a target group location, and is relatively close to the busiest trunk routes in the Tees Valley. It is well in-land from the coast. The results are likely to represent the worst case location within Hartlepool, with levels comfortably below the objectives.

Darlington (St Cuthbert's Way) ratified full year data is as follows, all in µg/m³ (g)

	2002	2001	2000	Objective
annual mean	29	29	-	40
max 24 hour (exceedances)	73 (25)	85 (20)	-	50 (35)
90th percentile	45	46	-	50

This is an in-land roadside site close to a busy town centre inner ring road roundabout. As with Stockton (Yarm) above, this station shows the effect of heavy slow moving traffic on particulate PM10 concentrations. There are no target groups present at this type of location.

Overall, the extensive monitoring data within the Tees Valley gives a view if the influence of the main sources of particulate PM10. Heavy, slow moving traffic can give high concentrations of particulate PM10 at roadside, but are not enough to cause an exceedance of the objectives, and there are unlikely to be target groups present. At points further away from traffic, concentrations fall markedly. Industry can cause high levels of particulate PM10 concentrations in the local vicinity, but these are less likely to be a problem at distance, unless there is grounding of a tall stack plume. The Hartlepool (Seaton Carew) station suggests that coastal sources, such as sand and salt lift-off can give very high concentrations and exceedances over a short period of time.

The monitoring results show that the proposed objectives for 2010 are going to be difficult to achieve across the whole Tees Valley area.

Background Concentrations
(Appendix 1)

Nationally derived background concentrations of particulate PM10 as an annual mean for each square kilometre grid across the Council area for 2001, with projections for 2004 and 2010, are as follows :

	2001	2004	2010
Objective µg/m³ (g)	-	40	40 (target 20)
maximum µg/m³(g)	19.3	18.5	16.9
minimum µg/m³(g)	17.3	16.6	15.5

These show that the National annual mean objective is comfortably met in 2004, and the provisional objective planned for 2010. However, monitoring data at Seaton Carew suggest that these background concentrations do not take account of occasional coastal influences.

Road Traffic
(Appendix 2)

Road traffic is a significant source of particulate PM10 at ground-level. Hartlepool does not have high traffic flows, and there are no road areas with 'canyon' effect. Housing and other target group areas such as schools and hospitals tend to be set well back from the roadside, particularly on the main trunk roads.
There are no major road changes proposed over the next ten years, but the main A689 route through the town centre area has been diverted since the 2000 Review & Assessment as part of the Harbour redevelopment. This has improved traffic flow, and reduced congestion in parts of the old town areas.

Hartlepool does not have any narrow and congested streets with residential properties close to the kerb. In addition there are no busy streets identified where people may be exposed for the averaging period close to traffic.
There is no bus station as such, and some roads close to the town centre have a high proportion of buses. However, other road traffic is relatively low, and residential areas are set well back from the roadside.

Consultants CES (now Faber-Maunsell) carried out detailed modelling of the road system in and around Hartlepool for the 1st (2000) Review and Assessment, using the AAQuiRE air quality model. This showed that all road areas in 2004 would be well below both the annual mean objective of 40 µg/m³ (g), and the 90th percentile of the 24 hour mean objective of 50 µg/m³ (g). Traffic flow projections have been updated based on 2001/2002 traffic count data, projected forward using the latest TEMPRO factors, and are shown in Appendix 2. Where a direct comparison is possible, a number of town centre roads show a decrease over earlier projections, and need no further consideration. The northern access route, the A179, from the A19 trunk road towards the town centre, is showing a significant increase over earlier projections, but this road runs well away from target group areas and needs no further consideration. Other roads that show an increase in traffic have traffic flows that remain well below those in other areas, and which are known to be well below the objective levels. They also need no further consideration.

The extensive monitoring results given earlier show that the worst case particulate PM10 concentration in 2002 within the Hartlepool Council area, away from the narrow coastal strip and where target groups may be present, was unlikely to exceed 22 µg/m³ (g) as an annual mean, and 34 µg/m³ (g) as the 90th percentile of the 24 hour mean.
Technical guidance (page 8-10) provides a method to project the 2002 annual mean forward to

Road Traffic
(continued)

2004 and 2010. The method uses the maximum secondary PM10 level of 5.68 µg/m³ (g) in the background tables of Appendix 1 factored forward to a value of 5.6 in 2002, 5.3 in 2004 and 4.5 in 2010 using the supplied correction factors. A constant coarse particle level of 10.5 µg/m³ (g) is used with the secondary element to find the primary PM10 fraction for 2002, as follows :

worst case (target groups present) 22 – 5.6 – 10.5 = 5.9 µg/m³ (g)

This value are then factored forward using the supplied correction factors, as follows :

	2002	2004	2010
worst case (target groups present)	5.9	5.6	4.9

The total estimated PM10 concentration for the given year is obtained by adding together the fixed coarse element with the secondary and primary elements for that year, as follows :

worst case (target groups present) 2004 10.5 + 5.3 + 5.6 = **21.4 µg/m³ (g)**

worst case (target groups present) 2010 10.5 + 4.5 + 4.9 = **19.9 µg/m³ (g)**

This confirms that while the 2004 annual mean objective of 40 µg/m³ (g) will be easily met in all areas, the proposed 2010 objective of 20 µg/m³ (g) will be difficult to meet without further reductions in PM10 emissions.

Technical guidance (page 8-41) also provides a graph to estimate the number of exceedances of the 24 hour mean objective from the derived annual means above.

	annual mean	exceedances
worst case (target groups present) 2004	21.4 µg/m³ (g)	6
worst case (target groups present) 2010	19.9 µg/m³ (g)	4

For year 2004, the number of exceedances is well below the maximum objective level of 35 in all areas.

For year 2010, the number of exceedances is predicted to be below the proposed maximum objective level of 7 where target groups may be present.

While this analysis shows that the 2004 objectives for particulate PM10 will be readily met, there is an on going need to further investigate PM10 emissions from traffic. Roads within Hartlepool town centre with the highest traffic flows and / or high heavy goods vehicle and bus flows, will included in discretionary detailed modelling work using the DMRB screening model, and the AAQuiRE air quality model. The results will be reported as a separate study.

Other Transport

The only rail route within the Hartlepool Council area is the coastal route from Stockton to Sunderland. Although diesel operated, traffic is light and not considered a significant particulate PM10 source.

The Hartlepool port also has light traffic and is not considered a significant source.

Part B Processes (Appendix 3)

There are 20 part B small industrial processes and 11 petrol stations registered within the Council area, but none are noted as significant sources of particulate PM10.

Part A Processes (Appendix 4)

There are 12 part A industrial processes within the Council area, all of which are relatively low emitters of particulate PM10. There are also a number of large industrial processes located in the neighbouring Council areas of Redcar & Cleveland and Stockton-on-Tees to the South. Detailed analysis of all monitoring data across the whole of the Tees Valley shows that low-level (usually fugitive) industrial emissions can have an impact on ground-level concentrations of particulate PM10 in the immediate vicinity, but not at distance. High level emissions from tall stacks are likely to impact over distance if there is plume grounding. The Hartlepool Council area is relatively far away from the major industrial emitters, and being on an infrequent wind direction, there has been no significant impact noted.

Other Emitters

There is one aggregate quarry operating within the Council area, to the south-east of Hart village. While there are target groups present in the range 400 – 1000 metres, background levels are well below guidance values. Technical guidance (page 8-33) advises that it is only necessary to consider receptors at these distances if background PM10 levels in 2004 exceed 27 $\mu g/m^3$ (g). The background concentration (Appendix 1b) within the grid reference (44705340) is 17.1 $\mu g/m^3$ (g), and there is no need to proceed further. There have been no dust complaints or visual causes for concern.

There are no landfill sites within the Council area, but two large landfill sites are located at Cowpen Bewley and Seal Sands on the industrial North bank of the river Tees, within the neighbouring Stockton-on-Tees Council area. Both are well away from any residential areas, and there have been no complaints regarding these operations.

No other significant man-made emission sources have been identified.

There is evidence that coastal natural sources such as salt and sand can have a very significant impact in extreme weather conditions. These occurrences are relatively rare, but the monitoring results on the coastal strip at Seaton Carew (where some target groups may be present) have shown an annual mean of 26 $\mu g/m^3$ (g) in 2002, and a 90th percentile of 24 hour means of 49 $\mu g/m^3$ (g). These levels are well below the 2004 objectives, but the projected annual mean for 2010 using the technical guidance method (page 8-10) is 23.3 $\mu g/m^3$ (g), with 9 exceedances. This is above the proposed 2010 objectives of 20 $\mu g/m^3$ (g) as an annual mean, with a maximum of 7 exceedances.

Conclusion

Particulate PM10 concentrations across the Hartlepool Council area are, and will continue to be, below the national air quality objectives, although there is some uncertainty about the impact of coastal sources. As road traffic is identified as a significant source of ground-level concentrations of particulate PM10, a discretionary modelling assessment of certain road areas with slow moving traffic and a higher than average bus flow will be carried out as a separate study.

It is noted that the planned tighter objectives for 2010 may not be met without significant reductions in particulate PM10 from all sources. This will require a better understanding of source origin at different locations.

SULPHUR DIOXIDE

Objectives

1. Maximum 266 µg/m³ as a 15 minute mean with up to 35 exceedances, by December 2005
2. Maximum 350 µg/m³ as a 1 hour mean with up to 24 exceedances, by December 2004
3. Maximum 125 µg/m³ as a 24 hour mean with up to 3 exceedances, by December 2004

Overview

Natural gas is readily available for domestic, commercial and some industrial use, and low sulphur diesel fuel widespread. The main source of sulphur dioxide pollution is from large industrial processes using higher sulphur fuels and waste products.

Year 2000 R & A

3rd stage Review & Assessment was required to evaluate the extent to which sulphur dioxide emissions from large industrial processes in neighbouring Council areas to the South affected the south-west region of Hartlepool. There was no need to declare an Air Quality Management Area, and this was confirmed by a supplementary assessment of sulphur dioxide in 2001 using up-dated emission and background concentration data.

Monitoring Data
(Reference 1)

A Local continuous monitoring station has been located near the coast at Seaton Carew since July 2000, to the North of the major industrial sources of sulphur dioxide.

Hartlepool (Seaton Carew) ratified full year data is as follows, all in µg/m³

	2002	2001		Objective
max 15 minute (exceedances)	168 (0)	170 (0)	-	260 (35)
max 1 hour (exceedances)	145 (0)	109 (0)	-	350 (24)
max 24 hour (exceedances)	51 (0)	48 (0)	-	125 (3)

There have been no exceedances recorded at this station.

Two AURN continuous monitoring stations are situated in the neighbouring Council areas of Middlesbrough and Redcar & Cleveland to the South of Hartlepool. Both stations are close to the main industrial areas, with Redcar & Cleveland station more on a prevailing wind direction.

Middlesbrough AURN station ratified full year data is as follows, all in µg/m³

	2002	2001	2000	Objective
max 15 minute (exceedances)	213 (0)	185 (0)	277 (1)	260 (35)
max 1 hour (exceedances)	184 (0)	149 (0)	194 (0)	350 (24)
max 24 hour (exceedances)	72 (0)	48 (0)	51 (0)	125 (3)

Redcar & Cleveland AURN station ratified full year data is as follows, all in µg/m³

	2002	2001	2000	Objective
max 15 minute (exceedances)	184 (0)	319 (6)	322 (2)	260 (35)
max 1 hour (exceedances)	120 (0)	245 (0)	226 (0)	350 (24)
max 24 hour (exceedances)	67 (0)	88 (0)	53 (0)	125 (3)

Although some exceedances of the 15 minute sulphur dioxide objective are noted from time to time, the frequency is well below the national objective, reinforcing the results seen at the Hartlepool Local station. There are no exceedances of the 24 hour or 1 hour objectives.

Background Concentrations (Appendix 1)

Nationally derived background concentrations of sulphur dioxide as an annual mean for each square kilometre grid across the Council area for 2001, with projections to 2004 / 2005 using the 0.75 factor in Technical Guidance, are as follows :

	2001	2004 / 2005
maximum µg/m³	13.1	9.8
minimum µg/m³	2.33	1.75

The 13.1 µg/m³ maximum relates to one square kilometre grid only, at the south-eastern tip of Hartlepool on the coast, downwind of industrial emitters in the neighbouring Council area of Stockton-on-Tees. The rest of the Hartlepool Council area does not exceed 6.73 µg/m³ as a 2001 annual mean, or 5.04 µg/m³ by 2004 / 2005.

Analysis of monitoring data in the Tees Valley indicates that if annual means of sulphur dioxide are below 10 µg/m³, there will be no exceedances at the 24 hour or 1 hour mean, and less than 5 exceedances at the 15 minute level. The background data suggests that all three National objectives will be easily met throughout the Council area by 2004 / 2005.

Domestic Sources

The majority of dwellings within the Hartlepool Council area are covered by smoke control orders, and the principal fuel is now natural gas. Three rural villages, Hart, Dalton and Elwick, are excluded but are not significant coal burning areas. No further action is required.

Road Traffic (Appendix 2)

Road traffic is not a significant source of sulphur dioxide, and does not require analysis.

Rail Traffic

The only rail route within the Hartlepool Council area is the coastal route from Stockton to Sunderland. Although diesel operated, traffic is light and not considered a significant sulphur dioxide source.

There are no areas where diesel locomotives may be regularly stationary for more than 15 minutes.

Port Traffic

The Hartlepool port has light traffic and is not considered a significant source.

Part B Processes (Appendix 3)

There are 20 part B small industrial processes and 11 petrol stations registered within the Council area, but none are noted as significant sources of sulphur dioxide.

Part A Processes (Appendix 4)

There are 12 part A industrial processes within the Council area, which have in total emitted less than 100 tpa of sulphur dioxide. Modelling work carried out in the year 2000 Review & Assessment showed that this level of release was not a significant factor in ground level concentrations.

There are a number of large sulphur dioxide emitters located in the neighbouring Council areas of Redcar & Cleveland and Stockton-on-Tees to the South. The emissions have been projected forward to 2005 by the Environment Agency, and have been modelled across the Tees Valley, including Hartlepool, using the AAQuiRE air pollution model. The results (reference 3) show that there will be no exceedance at the 15 minute level within the Hartlepool Council area.

Other Emitters

No other significant emission sources have been identified.

Conclusion

Sulphur dioxide concentrations across the Hartlepool Council area are, and will continue to be, below the national air quality objectives. Following detailed modelling of sulphur dioxide emissions from large industrial processes in neighbouring Council areas to the South, there is no need to proceed further.

CARBON MONOXIDE

Objective Maximum 10 mg/m³ as an 8 hour running mean by December 2003, with no exceedances

Overview With natural gas readily available for domestic, commercial and some industrial use, the most significant sources of carbon monoxide are road traffic, and one Part A industrial process (Titanium Dioxide manufacture).

Year 2000 R & A There was no need to proceed beyond the 1st stage Review & Assessment

Monitoring Data (Reference 1) A Local continuous monitoring station has been located near the coast at Seaton Carew since July 2000, largely downwind of the major industrial source.

Hartlepool (Seaton Carew) Local station ratified full year data is as follows, all in mg/m³

	2002	2001	Objective
annual mean	0.22	0.22	
max 8 hour running mean	1.4	2.4	10

A mobile continuous monitoring station operated for the first three months of 2001, close to the main A689 trunk road into Hartlepool.

The maximum 8 hour running mean was 1.7 mg/m³, against an objective maximum of 10 mg/m³.

Two AURN continuous monitors operate in the neighbouring Council areas of Middlesbrough (urban industrial) and Redcar & Cleveland (suburban), both to the South of Hartlepool.

Middlesbrough AURN station ratified full year data is as follows, all in mg/m³

	2002	2001	2000	Objective
annual mean	0.26	0.32	0.28	
max 8 hour running mean	1.5	4.1	1.3	10

Redcar & Cleveland AURN station ratified full year data is as follows, all in mg/m³

	2002	2001	2000	Objective
annual mean	0.29	0.35	0.35	
max 8 hour running mean	2.2	4.5	1.4	10

All monitoring results are well below the objective of 10 mg/m³.

Background Concentrations
(Appendix 1)

Nationally derived background concentrations for each square kilometre grid across the Council area for 2001 are estimated to lie between 0.24 mg/m^3 and 0.35 mg/m^3 as an annual mean. These are predicted to fall by 2003 to between 0.20mg/m^3 and 0.29 mg/m^3 respectively. Although there is no clear relationship between annual mean and 8 hour running mean, typical factors from the continuous monitors for the 8 hour running mean are between 5 to 10 times the annual mean, with the worst case factor in 2001 of 13.5. Using this worst case, background concentrations as an 8 hour running mean will not exceed 4.0 mg/m^3, well within the objective level.

Road Traffic
(Appendix 2)

Daily average traffic flows (ADT) for the principal roads have been derived from traffic counts over 2001 / 2002, and projected to 2005 using the latest TEMPRO factors. These 2005 projections are used as the worst case for carbon monoxide in 2003, and compared with technical guidance criteria for possible objective exceedances, as follows :

vehicles / day	Technical Guidance max ADT	Hartlepool max ADT 2003
single carriageway	80,000	19,000
dual carriageway	120,000	28,000
motorway	140,000	45,000

The worst case junction does not exceed 40,000 vehicles / day as a combined ADT, and there are no areas of road with 'canyon' characteristics.

Other Transport

There is a coastal rail route between Stockton and Sunderland passing through Hartlepool which has light traffic and is not a significant factor.
The Hartlepool port also has light traffic, and is not a significant factor.

Part B Processes
(Appendix 3)

There are 20 part B small industrial processes and 11 petrol stations registered within the Council area, but they are not significant sources of carbon monoxide.

Part A Processes
(Appendix 4)

There are 12 part A industrial processes within the Council area, of which one emits 90% of the total industrial emissions. Monitoring data, however, shows that industrial emissions do not contribute significantly to ground level carbon monoxide concentrations.
A number of other part A processes with large carbon monoxide releases are located in the neighbouring Council areas of Redcar & Cleveland and Stockton-on-Tees, to the South. These are too far away and on an infrequent wind direction to have any impact.

Other Emitters

No other significant emission sources have been identified.

Conclusion

Carbon monoxide concentrations across the Hartlepool Council area are, and will continue to be, well below the national air quality objective. There is no need to proceed further.

BENZENE

Objectives

1. Maximum 16.25 µg/m³ as a running annual mean by December 2003, with no exceedances
2. Maximum 5.00 µg/m³ as an annual mean by December 2010, with no exceedances

Overview

Road transport is the most significant source of benzene within the Hartlepool Council area. There is one part A industrial process (crude oil storage) within the Council area which has benzene emissions. A number of more significant industrial processes which have benzene emissions are located within Redcar & Cleveland and Stockton-on-Tees Council areas to the South, but are too far away, and on an infrequent wind direction, to have any impact.

Year 2000 R & A

There was no need to proceed beyond the 1st stage Review & Assessment

Monitoring Data
(Reference 1)

There is no monitoring of benzene concentrations within the Hartlepool Council area.

Continuous monitoring of benzene is carried out at a Local station within Redcar & Cleveland Council area to the South, closer to significant industrial emitters.

Redcar (Corporation Road) ratified full year data is as follows, all in µg/m³

Objectives 16.25 / 5.0 µg/m³	2002	2001	2000
annual mean	1.29	2.93	2.03
max running annual mean	3.12	2.93	5.59

Monitored levels are falling following major process improvements on the industrial units.

Continuous monitoring of benzene was also carried out at a national AURN station within Middlesbrough Council area to the South, also closer to the significant industrial emitters, and more influenced by road traffic emissions. The station was closed at the end of 2000.

Middlesbrough (Breckon Hill) ratified full year data is as follows, all in µg/m³

Objectives 16.25 / 5.0 µg/m³	2000	1999	1998
annual mean	2.08	2.54	2.47
max running annual mean	2.47	2.70	3.22

The Middlesbrough continuous monitor was replaced by a pumped diffusion tube system in February 2002, as part of a new national benzene monitoring system. Preliminary results for 2002 show an 11 month mean of 1.7 µg/m³, and confirm on-going reductions in benzene emissions, both from industry and traffic.

Levels of benzene concentrations within the Hartlepool Council area will be lower than those at Middlesbrough due to distance from the industrial sources, a less frequent wind direction, and lower levels of road traffic concentrations.

Background Concentrations (Appendix 1)

Nationally derived background concentrations of benzene as an annual mean for each square kilometre grid across the Council area for 2001, and projections to 2003 and 2010, are as follows

	2001	2003	2010
Objective		16.25	5.0
maximum µg/m³	0.4	0.5	0.4
minimum µg/m³	0.3	0.3	0.2

These are well below either benzene objective.

Road Traffic (Appendix 2)

Daily average traffic flows (ADT) for the principal roads have been derived from traffic counts over 2001 / 2002, and projected to 2005 using the latest TEMPRO factors. These 2005 projections are used as the worst case for carbon monoxide in 2003, and compared with technical guidance criteria for possible objective exceedances, as follows :

vehicles / day	Technical Guidance max ADT	Hartlepool max ADT 2003	Hartlepool max ADT 2010
single carriageway	80,000	19,000	21,000
dual carriageway	120,000	28,000	30,000
motorway	140,000	45,000	49,000

The worst case junction does not exceed 40,000 vehicles / day as a combined ADT in 2003, or 43,000 vehicles / day in 2010, and there are no areas of road with 'canyon' characteristics.
There are no road changes in the latest 10 year plan which would adversely affect worst case traffic flow estimates.

Other Transport

No significant sources.

Part B Processes (Appendix 3)

There are 20 part B small industrial processes registered within the Council area, all of which have no sources of benzene.

Petrol Stations

There are 11 petrol stations registered within the Council area with a throughput in excess of 500 m³ per year. All of the stations have stage 1 vapour recovery on underground storage tanks, but, as there is no requirement, they are not fitted with stage 2 vapour recovery at the dispensing pumps.
Technical guidance advises that it is only necessary to consider those petrol stations with a throughput in excess of 2000 m³ of petrol (2 million litres of petrol per annum), which are close to a busy road with daily traffic flows of more than 30,000 vehicles, and with relevant receptors within 10 metres of the pumps.

There are no petrol stations within the Hartlepool Council area that meet all of these criteria, and no further action is required.

Part A Processes (Appendix 4)

There are 12 part A industrial processes within the Council area, of which one is a small (20 tpa) emitter of benzene from crude oil storage tanks, close to the village of Greatham. The nearest receptor is further than 1 km on an infrequent wind direction, and inspection of the nomograms 3.1 – 3.4 in Technical Guidance show that the threshold will not be exceeded at the receptor.

Part A Processes (continued)

A number of other part A processes with significant benzene releases are located in the neighbouring Council areas of Redcar & Cleveland and Stockton-on-Tees, to the South. These are too far away and on an infrequent wind direction to have any impact.

Other Emitters

No other emission sources have been identified.

Conclusion

Benzene concentrations across the Hartlepool Council area are, and will continue to be, well below the national air quality objectives. There is no need to proceed further.

1,3-BUTADIENE

Objective Maximum 2.25 µg/m³ as a running annual mean by December 2003, with no exceedances

Overview Road transport exhaust emissions are the most significant source of 1,3-butadiene within the Hartlepool Council area, with no industrial emissions.
There is one significant part A industrial process which has 1,3-butadiene emissions located within Redcar & Cleveland Council area to the South, but this is too far away, and on an infrequent wind direction, to have any impact.

Year 2000 R & A There was no need to proceed beyond the 1st stage Review & Assessment

Monitoring Data (Reference 1)

There is no monitoring of 1,3-butadiene concentrations within the Hartlepool Council area.

Continuous monitoring of 1,3-butadiene is carried out at a Local station within Redcar & Cleveland Council area to the South, closer to the significant industrial emitter.

Redcar (Corporation Road) ratified full year results are as follows, all in µg/m³

Objective 2.25 µg/m³	2002	2001	2000
annual mean	0.70	1.20	0.87
max running annual mean	1.44	1.19	1.28

Concentrations are falling following major process improvements on the industrial unit.

Continuous monitoring of 1,3-butadiene was also carried out at a national AURN station within Middlesbrough Council area to the South, also closer to the significant industrial emitter, and more influenced by road traffic emissions. The station was closed at the end of 2000.

Middlesbrough (Breckon Hill) ratified full year results are as follows, all in µg/m³

Objective 2.25 µg/m³	2000	1999	1998
annual mean	0.23	0.29	0.27
max running annual mean	0.29	0.32	0.36

The Middlesbrough continuous monitor has been replaced by a pumped diffusion tube system in April 2003 as part of a new national 1,3-butadiene monitoring system. Early results indicate lower levels than those above.

Levels of 1,3-butadiene concentrations within the Hartlepool Council area will be lower than those at Middlesbrough or Redcar due to distance from the industrial source, a less frequent wind direction, and lower levels of road traffic concentrations.

Background Concentrations (Appendix 1)

Nationally derived background concentrations of 1,3-butadiene as an annual mean for each square kilometre grid across the Council area for 2001, and projections to 2003, are as follows, all in µg/m³

	2001	2003
Objective		2.25
maximum µg/m³	0.25	0.23
minimum µg/m³	0.13	0.11

These are well below the 1,3-butadiene objective of 2.25 µg/m³.

Road Traffic (Appendix 2)

Road traffic has been a significant source of 1.3-butadiene through petrol-vehicle exhausts, but the introduction of catalytic converters onto the exhaust systems of petrol-engined vehicles has contributed to much lower emission levels. The relatively low levels of traffic flow within the Hartlepool Council area, and absence of 'canyon' effect road locations, means that road traffic emissions for 2003 can be disregarded.

Other Transport

No significant sources.

Part B Processes (Appendix 3)

There are 20 part B small industrial processes and 11 petrol stations registered within the Council area, but there are no sources of 1,3-butadiene.

Part A Processes (Appendix 4)

There are 12 part A industrial processes within the Council area, but there are no 1,3-butadiene emissions.

One part A industrial emitter of 1,3-butadiene is located in the neighbouring Council area of Redcar & Cleveland to the South. This process is too far away and on an infrequent wind direction to have any impact.

Other Emitters

No other emission sources have been identified.

Conclusion

1,3-Butadiene concentrations across the Hartlepool Council area are, and will continue to be, well below the national air quality objective. There is no need to proceed further.

LEAD

Objectives

1. Maximum 0.5 µg/m³ as an annual mean by December 2004, with no exceedances
2. Maximum 0.25 µg/m³ as an annual mean by December 2008, with no exceedances

Overview

Following the introduction of lead-free petrol in the early 1990's, and subsequent ban on sales of leaded petrol in the UK from January 1 2000, road traffic is no longer a significant source of lead in the atmosphere. Emissions of lead are now restricted to a variety of industrial activities, including battery manufacture, pigments in paints and glazes, alloys, radiation shielding, tank lining and piping.

There are no industrial processes within the Hartlepool Council area, or in neighbouring Council areas, involved in lead processing.

Year 2000 R & A

There was no need to proceed beyond the 1st stage Review & Assessment

Monitoring Data
(Reference 1)

Monitoring of lead is carried out at three locations within the Stockton-on-Tees Council area to the South as part of a heavy metal monitoring programme

Full year results are as follows, all in µg/m³ as an annual mean

Stockton-on-Tees		2002	2001	2000
Redmarshall	rural	<0.01	<0.01	<0.01
Eaglescliffe	industry boundary	<0.01	<0.01	<0.01
Seal Sands	industry boundary	<0.01	<0.01	<0.01

Concentrations are consistently below the limit of detection.

Annual mean lead-in-air concentrations are also measured at urban background national network sites in Leeds and Newcastle.

Full year results are as follows, all in µg/m³ as an annual mean

	2001	2000	1999
Leeds	0.031	0.027	0.039
Newcastle	0.032	0.008	0.013

Concentrations are well below the National objectives.

Levels of lead-in-air concentrations within the Hartlepool Council area are expected to be below the limit of detection.

Background Concentrations

There are no Nationally derived background concentrations of lead-in-air.

Road Traffic
(Appendix 2)

Road traffic is no longer a significant source of lead-in-air.

Other Transport

No significant sources.

Part B Processes (Appendix 3)	There are 20 part B small industrial processes and 11 petrol stations registered within the Council area, but there are no sources of lead.
Part A Processes (Appendix 4)	There are 12 part A industrial processes within the Council area, but none are connected with lead manufacturing or processing. There are no lead-related industrial processes in neighbouring Council areas.
Other Emitters	No other emission sources have been identified.
Conclusion	Lead-in-air concentrations across the Hartlepool Council area are, and will continue to be, well below the national air quality objectives. There is no need to proceed further.

11. Conclusions

11.1 Road traffic remains the major source of air pollution within the Hartlepool Council, and has significant impact on nitrogen dioxide and particulate PM10 concentrations at ground level.

11.2 All thirteen current air quality objectives, covering seven pollutants, will be met within the Hartlepool Council area by their due dates. There continues to be no need to declare any Air Quality Management Areas.

11.3 The objectives of most concern are the annual mean for nitrogen dioxide, and the 24 hour objective for particulate PM10, both for which further precautionary monitoring is required. The main source of these pollutants within the Council area is traffic, although there are a wider range of other particulate PM10 sources that may have some impact from time to time, in particular coastal sources such as salt particles.

11.4 The two proposed objectives for particulate PM10 in 2010 are less likely to be met, based on current continuous monitoring of concentrations within the Hartlepool Council area, and across the Tees Valley area, without significant reductions in source emission. This may prove difficult within Hartlepool if natural coastal sources are shown to be the dominant source.

12. Further Work

Road traffic is recognised as the main source of pollution within the Hartlepool Council area, and it has been decided to carry out a detailed modelling study of pollution concentrations of nitrogen dioxide and particulate PM10. This will be carried out for the most heavily congested traffic areas within Hartlepool Town where target group members of the public are likely to be present.

Sources of particulate PM10 are the most diverse of all the pollutants under consideration. Further analysis of particulate PM10 episodes is required to see how the proposed objectives for 2010 may be met, with emphasis on natural coastal sources.

13. Consultation

External	Internal
Secretary of State	Tees Valley Environmental Protection Group
Environment Agency	Corporate Policy and Resources
Highways Authority – operations department	Transport Planning / Tees Valley JSU
NHS	Land Use Planning
Air Quality Forum - industry and environmental groups	Local Agenda 21 and Energy management

This report will be placed on the Hartlepool Council web-site, and copies placed in the main reference library.

APPENDIX 1a
Background Concentrations

Hartlepool NOx / NO2 Background Concentrations 2001 / 2005 / 2010 - Grid reference X = 441500 to 454500

Grid reference		NOx 2001 as NO2 annual mean		NOx 2005 as NO2 annual mean		NOx 2010 as NO2 annual mean		NO2 2001 annual mean		NO2 2005 annual mean		NO2 2010 annual mean	
X	Y	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³
441500	527500	16.6	31.5	14.4	27.3	11.2	21.2	10.9	20.8	9.9	18.8	8.3	15.8
442500	527500	18.5	35.1	15.8	30.0	12.2	23.1	11.8	22.4	10.6	20.1	8.8	16.8
442500	528500	17.7	33.7	15.3	29.0	11.7	22.3	11.5	21.8	10.3	19.6	8.6	16.4
442500	529500	17.0	32.3	14.7	27.9	11.4	21.6	11.1	21.1	10.1	19.1	8.4	16.0
442500	530500	16.7	31.8	14.4	27.4	11.2	21.2	11.0	20.9	9.9	18.9	8.3	15.8
443500	528500	19.8	37.7	16.9	32.1	12.9	24.6	12.4	23.5	11.1	21.0	9.2	17.5
443500	529500	19.1	36.3	16.3	31.0	12.5	23.8	12.1	22.9	10.8	20.5	9.0	17.1
443500	530500	18.5	35.2	15.8	30.0	12.2	23.1	11.8	22.4	10.6	20.1	8.8	16.8
443500	531500	18.4	35.0	15.7	29.8	12.1	22.9	11.7	22.3	10.5	20.0	8.8	16.7
443500	532500	18.4	35.0	15.7	29.8	12.0	22.8	11.7	22.3	10.5	20.0	8.7	16.6
444500	528500	20.2	38.3	17.2	32.6	13.2	25.0	12.5	23.8	11.2	21.3	9.3	17.7
444500	529500	19.1	36.3	16.4	31.1	12.6	23.9	12.1	22.9	10.8	20.6	9.1	17.2
444500	530500	18.6	35.3	15.9	30.2	12.3	23.3	11.8	22.5	10.6	20.2	8.9	16.9
444500	531500	18.4	35.0	15.7	29.9	12.1	23.0	11.7	22.3	10.5	20.0	8.8	16.7
444500	532500	18.4	34.9	15.6	29.7	12.1	22.9	11.7	22.3	10.5	19.9	8.8	16.7
444500	533500	18.2	34.5	15.4	29.3	11.9	22.6	11.6	22.1	10.4	19.8	8.7	16.5
445500	526500	23.4	44.4	20.4	38.7	15.5	29.5	13.8	26.3	12.6	23.9	10.4	19.8
445500	527500	21.9	41.6	19.1	36.3	14.5	27.6	13.3	25.2	12.1	22.9	9.9	18.9
445500	528500	20.6	39.1	18.1	34.3	13.7	26.0	12.7	24.1	11.6	22.0	9.6	18.2
445500	529500	19.6	37.2	17.3	32.8	13.1	24.9	12.3	23.3	11.2	21.3	9.3	17.6
445500	530500	18.6	35.3	15.9	30.3	12.3	23.4	11.8	22.5	10.6	20.2	8.9	16.9
445500	531500	18.4	34.9	15.7	29.9	12.1	23.0	11.7	22.3	10.5	20.0	8.8	16.7
445500	532500	18.5	35.2	15.9	30.2	12.2	23.2	11.8	22.4	10.6	20.2	8.8	16.8
445500	533500	18.3	34.7	15.6	29.7	12.0	22.8	11.7	22.2	10.5	20.0	8.7	16.6
445500	534500	18.0	34.2	15.4	29.3	11.8	22.4	11.6	22.0	10.4	19.8	8.6	16.4
445500	535500	17.7	33.6	15.7	29.8	11.8	22.4	11.4	21.7	10.5	20.0	8.6	16.4
446500	526500	23.5	44.7	20.5	39.0	15.7	29.8	13.9	26.4	12.7	24.1	10.5	20.0
446500	527500	22.1	42.0	19.3	36.7	14.7	28.0	13.3	25.3	12.2	23.1	10.1	19.2
446500	528500	20.8	39.6	18.3	34.7	13.9	26.4	12.8	24.3	11.7	22.2	9.7	18.4
446500	529500	20.0	38.0	17.6	33.5	13.4	25.5	12.4	23.6	11.4	21.7	9.4	17.9
446500	530500	18.9	36.0	16.3	31.0	12.6	23.9	12.0	22.8	10.8	20.5	9.1	17.2
446500	531500	18.7	35.5	16.1	30.5	12.4	23.5	11.9	22.6	10.7	20.3	8.9	17.0
446500	532500	18.7	35.6	16.1	30.5	12.4	23.5	11.9	22.6	10.7	20.3	8.9	17.0
446500	533500	18.2	34.5	15.6	29.7	12.1	22.9	11.6	22.1	10.5	19.9	8.8	16.7
446500	534500	17.5	33.3	15.1	28.7	11.6	22.1	11.4	21.6	10.3	19.5	8.6	16.3
446500	535500	17.0	32.3	15.2	28.9	11.5	21.8	11.1	21.1	10.3	19.6	8.5	16.1
446500	536500	16.3	31.0	14.6	27.8	11.1	21.0	10.8	20.5	10.1	19.1	8.3	15.7
447500	526500	22.3	42.4	19.7	37.4	15.3	29.1	13.4	25.5	12.3	23.4	10.4	19.7
447500	527500	21.8	41.4	19.2	36.5	14.8	28.2	13.2	25.1	12.1	23.0	10.1	19.2
447500	528500	21.2	40.3	18.7	35.6	14.4	27.4	12.9	24.6	11.9	22.6	9.9	18.8
447500	529500	21.0	39.9	18.5	35.2	14.2	27.0	12.8	24.4	11.8	22.4	9.8	18.7
447500	530500	20.1	38.2	17.4	33.0	13.5	25.7	12.5	23.7	11.3	21.4	9.5	18.1
447500	531500	19.4	36.8	16.7	31.8	13.1	24.8	12.2	23.1	11.0	20.9	9.3	17.6
447500	532500	19.1	36.3	16.5	31.4	12.8	24.4	12.1	22.9	10.9	20.7	9.2	17.4
447500	533500	18.5	35.1	16.1	30.5	12.5	23.7	11.8	22.4	10.7	20.3	9.0	17.1
447500	534500	17.6	33.5	15.3	29.1	11.9	22.7	11.4	21.7	10.4	19.7	8.7	16.6
447500	535500	16.9	32.2	15.3	29.1	11.6	22.1	11.1	21.1	10.4	19.7	8.6	16.3
447500	536500	16.4	31.1	14.8	28.1	11.2	21.3	10.8	20.6	10.1	19.2	8.4	15.9
448500	526500	20.9	39.7	18.7	35.5	14.8	28.1	12.8	24.4	11.9	22.6	10.1	19.2
448500	527500	20.7	39.3	18.5	35.1	14.5	27.5	12.7	24.2	11.8	22.4	9.9	18.9
448500	528500	20.3	38.5	18.2	34.5	14.2	26.9	12.5	23.8	11.6	22.1	9.8	18.6
448500	529500	20.5	39.0	18.4	35.0	14.3	27.2	12.7	24.1	11.7	22.3	9.9	18.8
448500	530500	20.6	39.2	18.0	34.2	14.2	27.0	12.7	24.1	11.6	22.0	9.8	18.7
448500	531500	20.7	39.3	18.1	34.3	14.2	26.9	12.7	24.2	11.6	22.0	9.8	18.6
448500	532500	20.5	38.9	17.9	34.0	14.1	26.7	12.6	24.0	11.5	21.9	9.7	18.5
448500	533500	19.7	37.5	17.3	32.8	13.5	25.7	12.3	23.4	11.3	21.4	9.5	18.0
448500	534500	18.6	35.3	16.3	30.9	12.7	24.2	11.8	22.5	10.8	20.5	9.1	17.3
448500	535500	17.3	32.8	15.7	29.8	12.0	22.8	11.3	21.4	10.5	20.0	8.7	16.6
449500	526500	20.4	38.8	18.4	35.0	14.8	28.2	12.6	24.0	11.8	22.4	10.2	19.3
449500	527500	20.7	39.4	18.7	35.5	14.8	28.2	12.7	24.2	11.8	22.5	10.2	19.3
449500	528500	20.7	39.4	18.7	35.5	14.8	28.1	12.7	24.2	11.9	22.6	10.1	19.2
449500	529500	21.6	41.1	19.5	37.0	15.4	29.2	13.2	25.0	12.2	23.2	10.4	19.7

		NOx 2001		NOx 2005		NOx 2010		NO2 2001		NO2 2005		NO2 2010	
Grid reference		as NO2 annual mean		as NO2 annual mean		as NO2 annual mean		annual mean		annual mean		annual mean	
X	Y	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³
449500	530500	21.6	41.0	19.0	36.1	15.1	28.7	13.1	24.9	12.0	22.8	10.3	19.5
449500	531500	21.9	41.7	19.3	36.6	15.3	29.0	13.3	25.2	12.1	23.0	10.3	19.6
449500	532500	24.1	45.7	21.1	40.0	16.7	31.7	14.1	26.8	12.9	24.5	11.0	20.9
449500	533500	23.1	43.8	20.2	38.4	15.9	30.3	13.7	26.1	12.5	23.8	10.6	20.2
449500	534500	21.4	40.7	18.8	35.7	14.8	28.1	13.1	24.8	11.9	22.6	10.1	19.2
449500	535500	20.1	38.1	18.1	34.4	14.0	26.6	12.5	23.7	11.6	22.1	9.7	18.5
450500	526500	20.6	39.2	19.6	37.2	15.7	29.8	12.7	24.2	12.3	23.3	10.5	20.0
450500	527500	21.0	39.9	19.8	37.7	15.6	29.6	12.8	24.4	12.4	23.5	10.5	19.9
450500	528500	21.1	40.0	19.9	37.8	15.5	29.4	12.9	24.5	12.4	23.5	10.4	19.8
450500	529500	21.9	41.6	20.6	39.1	15.9	30.3	13.2	25.1	12.7	24.1	10.6	20.2
450500	530500	24.4	46.4	25.4	48.2	18.4	35.0	14.3	27.1	14.7	27.9	11.7	22.3
450500	531500	24.7	46.9	25.6	48.6	18.4	35.0	14.4	27.3	14.7	28.0	11.7	22.3
450500	532500	26.5	50.3	27.1	51.5	19.6	37.3	15.1	28.7	15.4	29.2	12.3	23.3
450500	533500	25.4	48.3	26.2	49.8	18.8	35.8	14.7	27.9	15.0	28.5	11.9	22.7
450500	534500	23.8	45.2	24.7	47.0	17.6	33.5	14.0	26.6	14.4	27.4	11.4	21.7
450500	535500												
451500	526500	20.5	39.0	19.7	37.4	16.2	30.8	12.7	24.1	12.3	23.4	10.8	20.5
451500	527500	20.6	39.1	19.6	37.2	15.6	29.7	12.7	24.1	12.3	23.3	10.5	19.9
451500	528500	20.5	38.9	19.5	37.0	15.3	29.1	12.6	24.0	12.2	23.2	10.4	19.7
451500	529500	21.3	40.4	20.2	38.3	15.7	29.8	12.9	24.6	12.5	23.7	10.5	20.0
451500	530500	23.7	45.0	24.8	47.1	17.9	34.1	14.0	26.6	14.4	27.4	11.6	22.0
451500	531500	24.0	45.6	25.0	47.5	18.1	34.3	14.1	26.8	14.5	27.6	11.6	22.0
451500	532500												
451500	533500	24.6	46.8	25.5	48.5	18.4	34.9	14.4	27.3	14.7	28.0	11.7	22.3
451500	534500	22.9	43.5	24.1	45.7	17.1	32.5	13.7	26.0	14.1	26.8	11.2	21.2
452500	527500	19.7	37.5	19.0	36.1	15.5	29.5	12.3	23.4	12.0	22.8	10.4	19.8
452500	528500	19.4	36.8	18.7	35.5	14.9	28.3	12.2	23.1	11.8	22.5	10.2	19.3
452500	529500												
452500	530500												
452500	533500	23.1	43.9	24.3	46.1	17.4	33.1	13.7	26.1	14.2	27.0	11.3	21.5
452500	534500												
453500	527500												
453500	528500												
454500	527500												
		ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³
	minimum	16.3	31.0	14.4	27.3	11.1	21.0	10.8	20.5	9.9	18.8	8.3	15.7
	maximum	26.5	50.3	27.1	51.5	19.6	37.3	15.1	28.7	15.4	29.2	12.3	23.3

APPENDIX 1b
Background Concentrations

Hartlepool Background Concentrations - PM10 for 2001 / 2005 / 2010; SO2 for 2001; CO for 2001
Grid reference X = 441500 to 454500

		PM10 2001	PM10 2004	PM10 2010	PM10 2001 secondary	SO2 2001		CO 2001	
Grid reference		gravimetric annual mean	gravimetric annual mean	gravimetric annual mean	gravimetric annual mean	annual mean		annual mean	
X	Y	µg/m³ (g)	µg/m³ (g)	µg/m³ (g)	µg/m³ (g)	ppb	µg/m³	ppm	mg/m³
441500	527500	17.3	16.6	15.5	5.68	0.88	2.33	0.207	0.240
442500	527500	17.4	16.8	15.6	5.68	0.95	2.52	0.217	0.252
442500	528500	17.4	16.7	15.5	5.68	0.92	2.46	0.214	0.248
442500	529500	17.3	16.7	15.5	5.68	0.92	2.44	0.210	0.244
442500	530500	17.3	16.7	15.5	5.68	0.92	2.44	0.209	0.243
443500	528500	17.6	17.0	15.7	5.68	0.94	2.51	0.223	0.259
443500	529500	17.5	16.9	15.7	5.68	0.94	2.49	0.220	0.255
443500	530500	17.5	16.9	15.6	5.68	0.93	2.47	0.218	0.253
443500	531500	17.5	16.8	15.6	5.68	0.93	2.47	0.217	0.252
443500	532500	17.5	16.8	15.6	5.68	0.91	2.43	0.216	0.251
444500	528500	17.7	17.0	15.8	5.68	0.96	2.56	0.226	0.262
444500	529500	17.6	17.0	15.7	5.68	0.95	2.54	0.222	0.257
444500	530500	17.6	16.9	15.6	5.68	0.95	2.52	0.219	0.254
444500	531500	17.5	16.8	15.6	5.68	0.94	2.51	0.217	0.252
444500	532500	17.5	16.8	15.6	5.68	0.92	2.46	0.216	0.251
444500	533500	17.6	16.8	15.6	5.68	0.92	2.45	0.215	0.249
445500	526500	18.2	17.6	16.2	5.68	1.02	2.72	0.250	0.290
445500	527500	17.9	17.3	16.0	5.68	1.01	2.68	0.236	0.274
445500	528500	17.7	17.1	15.8	5.68	0.99	2.64	0.226	0.262
445500	529500	17.7	17.0	15.8	5.68	0.98	2.62	0.222	0.257
445500	530500	17.6	17.0	15.7	5.68	0.98	2.61	0.218	0.253
445500	531500	17.5	16.9	15.7	5.68	0.97	2.57	0.216	0.251
445500	532500	17.8	17.1	15.8	5.68	0.95	2.53	0.218	0.253
445500	533500	17.8	17.1	15.8	5.68	0.93	2.48	0.216	0.250
445500	534500	17.7	17.1	15.8	5.68	0.92	2.46	0.215	0.249
445500	535500	17.7	17.0	15.7	5.68	0.92	2.46	0.212	0.246
446500	526500	18.2	17.6	16.2	5.68	1.08	2.88	0.251	0.291
446500	527500	17.9	17.3	16.0	5.68	1.05	2.80	0.238	0.276
446500	528500	17.7	17.1	15.9	5.68	1.03	2.75	0.228	0.265
446500	529500	17.7	17.1	15.8	5.68	1.02	2.70	0.225	0.261
446500	530500	17.6	17.0	15.8	5.68	1.00	2.67	0.222	0.258
446500	531500	17.6	16.9	15.7	5.68	1.02	2.71	0.221	0.256
446500	532500	17.8	17.2	15.8	5.68	0.96	2.55	0.221	0.256
446500	533500	17.8	17.1	15.8	5.68	0.95	2.53	0.218	0.253
446500	534500	17.7	17.1	15.8	5.68	0.94	2.51	0.215	0.249
446500	535500	17.6	16.9	15.6	5.68	0.94	2.50	0.210	0.244
446500	536500	17.5	16.8	15.6	5.68	0.94	2.51	0.207	0.240
447500	526500	18.1	17.5	16.2	5.68	1.35	3.60	0.248	0.288
447500	527500	18.0	17.4	16.1	5.68	1.26	3.34	0.242	0.281
447500	528500	17.9	17.3	16.0	5.68	1.21	3.22	0.236	0.274
447500	529500	17.9	17.3	16.0	5.68	1.18	3.14	0.236	0.274
447500	530500	17.9	17.2	16.0	5.68	1.17	3.12	0.236	0.274
447500	531500	17.7	17.1	15.9	5.68	1.15	3.07	0.234	0.272
447500	532500	18.0	17.3	16.0	5.68	1.06	2.81	0.234	0.271
447500	533500	17.9	17.2	15.9	5.68	1.05	2.79	0.230	0.267
447500	534500	17.7	17.1	15.8	5.68	1.19	3.16	0.224	0.260
447500	535500	17.6	16.9	15.6	5.68	1.06	2.82	0.216	0.251
447500	536500	17.5	16.8	15.5	5.68	1.05	2.79	0.211	0.245
448500	526500	18.1	17.5	16.3	5.68	1.44	3.83	0.243	0.282
448500	527500	18.1	17.4	16.2	5.68	1.31	3.49	0.241	0.280
448500	528500	18.1	17.4	16.2	5.68	1.27	3.38	0.238	0.276
448500	529500	18.1	17.5	16.2	5.68	1.27	3.39	0.243	0.282
448500	530500	18.2	17.5	16.3	5.68	1.26	3.36	0.253	0.294
448500	531500	18.1	17.5	16.2	5.68	1.18	3.15	0.255	0.296
448500	532500	18.4	17.6	16.3	5.68	1.15	3.05	0.256	0.297
448500	533500	18.2	17.5	16.1	5.68	1.09	2.91	0.250	0.290
448500	534500	17.9	17.3	16.0	5.68	1.12	2.97	0.240	0.278
448500	535500	17.7	17.0	15.7	5.68	1.28	3.41	0.223	0.259
449500	526500	18.3	17.7	16.4	5.68	1.55	4.13	0.240	0.278

		PM10 2001	PM10 2004	PM10 2010	PM10 2001 secondary	SO2 2001		CO 2001	
Grid reference		gravimetric annual mean	gravimetric annual mean	gravimetric annual mean	gravimetric annual mean	annual mean		annual mean	
X	Y	µg/m³ (g)	µg/m³ (g)	µg/m³ (g)	µg/m³ (g)	ppb	µg/m³	ppm	mg/m³
449500	527500	18.3	17.7	16.4	5.68	1.42	3.79	0.243	0.282
449500	528500	18.4	17.8	16.5	5.68	1.38	3.67	0.244	0.283
449500	529500	18.5	18.0	16.7	5.68	1.48	3.94	0.253	0.293
449500	530500	18.6	18.0	16.7	5.68	1.33	3.55	0.261	0.303
449500	531500	18.6	18.0	16.6	5.68	1.25	3.33	0.268	0.311
449500	532500	19.3	18.5	16.9	5.68	1.15	3.07	0.300	0.348
449500	533500	19.0	18.2	16.7	5.68	1.12	2.98	0.292	0.339
449500	534500	18.7	17.9	16.4	5.68	1.13	3.00	0.279	0.324
449500	535500	18.4	17.6	16.1	5.68	1.12	2.98	0.263	0.305
450500	526500	18.2	17.6	16.4	5.68	1.70	4.53	0.234	0.271
450500	527500	18.2	17.6	16.4	5.68	1.49	3.97	0.240	0.278
450500	528500	18.3	17.7	16.5	5.68	1.47	3.91	0.241	0.280
450500	529500	18.5	17.9	16.7	5.68	1.45	3.87	0.250	0.290
450500	530500	18.6	17.9	16.7	5.68	1.64	4.37	0.259	0.300
450500	531500	18.5	17.9	16.6	5.68	1.41	3.74	0.266	0.308
450500	532500	18.9	18.2	16.7	5.68	1.24	3.29	0.294	0.341
450500	533500	18.6	17.9	16.4	5.68	1.20	3.18	0.286	0.332
450500	534500	18.3	17.5	16.1	5.68	1.20	3.19	0.272	0.316
450500	535500				5.68	1.33	3.54		
451500	526500	18.2	17.6	16.5	5.68	1.86	4.96	0.230	0.267
451500	527500	18.1	17.6	16.4	5.68	1.67	4.45	0.234	0.272
451500	528500	18.2	17.6	16.4	5.68	1.59	4.24	0.235	0.273
451500	529500	18.3	17.8	16.5	5.68	1.65	4.40	0.243	0.282
451500	530500	18.4	17.7	16.5	5.68	1.60	4.26	0.252	0.292
451500	531500	18.3	17.7	16.4	5.68	2.08	5.52	0.258	0.299
451500	532500				5.68	2.26	6.00		
451500	533500	18.4	17.7	16.2	5.68	1.51	4.02	0.278	0.322
451500	534500	18.1	17.3	15.9	5.68	2.51	6.67	0.265	0.307
452500	527500	17.9	17.4	16.3	5.68	2.33	6.19	0.227	0.263
452500	528500	17.9	17.4	16.2	5.68	2.14	5.70	0.226	0.262
452500	529500				5.68	2.53	6.73		
452500	530500				5.68	2.36	6.29		
452500	533500	18.0	17.3	16.0	5.68	1.49	3.97	0.263	0.305
452500	534500				5.68	1.75	4.65		
453500	527500				5.68	4.92	13.10		
453500	528500				5.68				
454500	527500				5.68				
		µg/m³ (g)	µg/m³ (g)	µg/m³ (g)	µg/m³ (g)	ppb	µg/m³	ppm	mg/m³
	minimum	17.3	16.6	15.5	5.68	0.88	2.33	0.21	0.24
	maximum	19.3	18.5	16.9	5.68	4.92	13.10	0.30	0.35

APPENDIX 1c
Background Concentrations

Hartlepool Background Concentrations - Benzene for 2001 / 2003 / 2010; 1,3-Butadiene for 2001 / 2003
Grid reference X = 441500 to 454500

Grid reference		Benzene 2001		Benzene 2003		Benzene 2010		1,3-Butadiene 2001		1,3-Butadiene 2003	
		annual mean		annual mean		annual mean		annual mean		annual mean	
X	Y	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³
441500	527500	0.082	0.265	0.085	0.276	0.067	0.217	0.060	0.136	0.050	0.112
442500	527500	0.087	0.283	0.090	0.294	0.070	0.229	0.066	0.148	0.054	0.121
442500	528500	0.085	0.275	0.089	0.288	0.069	0.225	0.064	0.143	0.052	0.118
442500	529500	0.083	0.270	0.087	0.283	0.068	0.222	0.061	0.138	0.051	0.114
442500	530500	0.083	0.270	0.087	0.282	0.068	0.222	0.060	0.136	0.050	0.113
443500	528500	0.090	0.293	0.094	0.305	0.073	0.237	0.069	0.156	0.056	0.127
443500	529500	0.088	0.286	0.092	0.298	0.071	0.232	0.067	0.150	0.055	0.123
443500	530500	0.087	0.282	0.090	0.294	0.071	0.230	0.065	0.146	0.053	0.120
443500	531500	0.086	0.278	0.090	0.293	0.070	0.229	0.064	0.145	0.053	0.120
443500	532500	0.085	0.277	0.090	0.291	0.070	0.228	0.064	0.144	0.053	0.119
444500	528500	0.092	0.298	0.097	0.315	0.075	0.244	0.071	0.160	0.059	0.132
444500	529500	0.089	0.288	0.094	0.305	0.073	0.237	0.068	0.152	0.056	0.126
444500	530500	0.087	0.284	0.092	0.300	0.072	0.235	0.066	0.149	0.055	0.123
444500	531500	0.086	0.279	0.091	0.297	0.071	0.232	0.065	0.147	0.054	0.122
444500	532500	0.085	0.275	0.090	0.292	0.070	0.229	0.064	0.145	0.053	0.120
444500	533500	0.083	0.269	0.088	0.287	0.070	0.226	0.064	0.143	0.053	0.119
445500	526500	0.112	0.365	0.116	0.378	0.089	0.290	0.084	0.189	0.068	0.154
445500	527500	0.100	0.324	0.104	0.339	0.080	0.261	0.077	0.173	0.064	0.143
445500	528500	0.091	0.297	0.097	0.315	0.075	0.244	0.072	0.162	0.060	0.134
445500	529500	0.088	0.287	0.094	0.305	0.073	0.237	0.068	0.154	0.057	0.128
445500	530500	0.086	0.280	0.092	0.299	0.072	0.233	0.066	0.149	0.055	0.124
445500	531500	0.085	0.276	0.091	0.295	0.071	0.230	0.065	0.147	0.054	0.122
445500	532500	0.083	0.270	0.091	0.296	0.071	0.232	0.066	0.149	0.056	0.126
445500	533500	0.081	0.264	0.090	0.291	0.070	0.228	0.065	0.147	0.055	0.124
445500	534500	0.080	0.261	0.088	0.287	0.069	0.225	0.064	0.145	0.054	0.122
445500	535500	0.080	0.259	0.088	0.287	0.070	0.227	0.063	0.141	0.053	0.120
446500	526500	0.114	0.370	0.117	0.381	0.090	0.292	0.085	0.192	0.069	0.156
446500	527500	0.102	0.333	0.107	0.347	0.082	0.266	0.079	0.177	0.064	0.145
446500	528500	0.095	0.309	0.100	0.326	0.078	0.252	0.074	0.166	0.061	0.137
446500	529500	0.093	0.301	0.098	0.318	0.076	0.246	0.071	0.160	0.059	0.132
446500	530500	0.091	0.295	0.096	0.311	0.074	0.242	0.069	0.155	0.057	0.128
446500	531500	0.090	0.291	0.095	0.308	0.074	0.240	0.068	0.152	0.056	0.126
446500	532500	0.087	0.283	0.094	0.307	0.074	0.240	0.068	0.153	0.057	0.128
446500	533500	0.085	0.277	0.093	0.302	0.073	0.236	0.066	0.149	0.056	0.125
446500	534500	0.083	0.270	0.091	0.296	0.071	0.232	0.064	0.145	0.054	0.122
446500	535500	0.081	0.263	0.090	0.291	0.071	0.230	0.062	0.139	0.052	0.118
446500	536500	0.079	0.257	0.087	0.284	0.070	0.226	0.060	0.134	0.051	0.114
447500	526500	0.114	0.371	0.118	0.385	0.091	0.295	0.084	0.188	0.068	0.154
447500	527500	0.108	0.351	0.113	0.367	0.087	0.283	0.081	0.182	0.066	0.149
447500	528500	0.103	0.334	0.109	0.355	0.084	0.274	0.078	0.175	0.064	0.144
447500	529500	0.103	0.335	0.109	0.355	0.084	0.274	0.077	0.174	0.064	0.143
447500	530500	0.104	0.338	0.110	0.358	0.086	0.278	0.076	0.172	0.063	0.141
447500	531500	0.102	0.332	0.109	0.353	0.084	0.274	0.074	0.167	0.061	0.137
447500	532500	0.099	0.322	0.108	0.350	0.084	0.272	0.074	0.166	0.061	0.138
447500	533500	0.097	0.314	0.105	0.342	0.082	0.266	0.072	0.162	0.060	0.135
447500	534500	0.093	0.301	0.102	0.330	0.079	0.258	0.069	0.156	0.058	0.130
447500	535500	0.087	0.284	0.097	0.314	0.076	0.247	0.065	0.146	0.055	0.123
447500	536500	0.083	0.271	0.092	0.300	0.073	0.238	0.062	0.139	0.052	0.118
448500	526500	0.112	0.364	0.116	0.378	0.090	0.291	0.081	0.182	0.066	0.149
448500	527500	0.110	0.356	0.115	0.373	0.088	0.287	0.080	0.181	0.066	0.149
448500	528500	0.108	0.351	0.114	0.370	0.088	0.286	0.080	0.179	0.065	0.147
448500	529500	0.113	0.367	0.119	0.388	0.092	0.299	0.082	0.185	0.067	0.151
448500	530500	0.122	0.396	0.127	0.414	0.098	0.319	0.086	0.193	0.070	0.157
448500	531500	0.124	0.402	0.129	0.420	0.100	0.324	0.086	0.194	0.070	0.157
448500	532500	0.122	0.395	0.130	0.421	0.100	0.325	0.086	0.194	0.071	0.159
448500	533500	0.116	0.377	0.124	0.404	0.096	0.312	0.083	0.186	0.068	0.153
448500	534500	0.107	0.349	0.115	0.375	0.090	0.291	0.077	0.173	0.064	0.144
448500	535500	0.094	0.307	0.103	0.335	0.081	0.263	0.068	0.154	0.057	0.129
449500	526500	0.129	0.419	0.132	0.428	0.105	0.342	0.080	0.179	0.066	0.148
449500	527500	0.113	0.367	0.120	0.390	0.093	0.301	0.083	0.186	0.069	0.155
449500	528500	0.116	0.376	0.123	0.401	0.096	0.311	0.084	0.188	0.070	0.157
449500	529500	0.124	0.403	0.132	0.429	0.102	0.333	0.088	0.198	0.073	0.164

Grid reference		Benzene 2001		Benzene 2003		Benzene 2010		1,3-Butadiene 2001		1,3-Butadiene 2003	
		annual mean		annual mean		annual mean		annual mean		annual mean	
X	Y	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³
449500	530500	0.131	0.426	0.139	0.451	0.107	0.349	0.091	0.204	0.074	0.167
449500	531500	0.133	0.431	0.144	0.468	0.111	0.362	0.094	0.211	0.078	0.175
449500	532500	0.129	0.419	0.167	0.543	0.129	0.419	0.113	0.254	0.100	0.226
449500	533500	0.122	0.395	0.161	0.522	0.124	0.403	0.109	0.245	0.097	0.219
449500	534500	0.110	0.357	0.149	0.483	0.115	0.373	0.102	0.229	0.092	0.207
449500	535500	0.095	0.310	0.135	0.439	0.105	0.342	0.093	0.209	0.085	0.192
450500	526500	0.125	0.407	0.130	0.422	0.104	0.338	0.079	0.177	0.066	0.148
450500	527500	0.111	0.361	0.120	0.389	0.093	0.301	0.083	0.186	0.070	0.157
450500	528500	0.115	0.373	0.124	0.402	0.096	0.312	0.084	0.188	0.070	0.158
450500	529500	0.123	0.400	0.131	0.427	0.102	0.332	0.088	0.197	0.073	0.164
450500	530500	0.130	0.423	0.138	0.449	0.107	0.347	0.091	0.204	0.075	0.168
450500	531500	0.131	0.426	0.142	0.463	0.110	0.358	0.093	0.210	0.077	0.174
450500	532500	0.127	0.412	0.163	0.529	0.126	0.408	0.110	0.248	0.098	0.220
450500	533500	0.119	0.388	0.155	0.505	0.120	0.390	0.106	0.238	0.094	0.212
450500	534500	0.107	0.349	0.143	0.465	0.111	0.360	0.098	0.221	0.088	0.199
450500	535500										
451500	526500	0.122	0.398	0.130	0.421	0.104	0.337	0.078	0.175	0.065	0.147
451500	527500	0.107	0.349	0.117	0.380	0.090	0.294	0.080	0.181	0.068	0.154
451500	528500	0.110	0.356	0.119	0.388	0.093	0.301	0.081	0.182	0.069	0.155
451500	529500	0.118	0.382	0.127	0.412	0.098	0.320	0.085	0.191	0.071	0.160
451500	530500	0.124	0.404	0.132	0.429	0.102	0.332	0.087	0.195	0.072	0.161
451500	531500	0.125	0.406	0.136	0.442	0.105	0.342	0.089	0.201	0.074	0.167
451500	532500										
451500	533500	0.113	0.367	0.148	0.482	0.114	0.372	0.102	0.229	0.091	0.205
451500	534500	0.101	0.327	0.136	0.442	0.105	0.341	0.094	0.212	0.085	0.192
452500	527500	0.100	0.325	0.110	0.359	0.086	0.279	0.077	0.173	0.066	0.148
452500	528500	0.101	0.328	0.112	0.363	0.087	0.282	0.076	0.172	0.066	0.148
452500	529500										
452500	530500										
452500	533500	0.100	0.324	0.135	0.440	0.105	0.341	0.094	0.212	0.086	0.193
452500	534500										
453500	527500										
453500	528500										
454500	527500										
		ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³	ppb	µg/m³
	minimum	0.079	0.257	0.085	0.276	0.067	0.217	0.060	0.134	0.050	0.112
	maximum	0.133	0.431	0.167	0.543	0.129	0.419	0.113	0.254	0.100	0.226

APPENDIX 2
Traffic Flow Projections

Road	Location	Year	ADT	2005 proj	2005 1st R & A	% + / -	2010 proj
A19	North of Sheraton Interchange	2002	42055	44330			48280
A19	North of A689 Interchange	2002	39157	41270			44950
A19	South of A179 Sheraton Interchange	2002	31513	33210			36180
A689	Stockton Road	2002	25793	27190	31235	-13 %	29610
A689	Belle Vue Way, west of Brenda Road	2002	24587	25910	25816	+0 %	28225
A689	Stockton Street	2002	24111	25410			27680
A179	Marina Way (new road)	2002	22275	23480			25570
A179	East of A19	2001	18407	19770	15524	+28 %	21520
A179	Hart Village	2002	17970	18940			20630
A179	Easington Road	2002	17882	18850			20530
C	Catcote Road, north of Brierton Road	2002	17701	18660	20455	-9 %	20320
B1277	Brenda Road, south of A689 roundabout	1997	14718	16720	15695	+7 %	18190
C	Raby Road, north of Challoner Road	1997	13561	15410	14865	+4 %	16760
A689	West of Newton Bewley	2002	13293	14010			15260
B1277	York Road	2002	13033	13740			14960
C	Wooler Road, south of South Road	1997	11810	13420	12825	+5 %	14600
A178	Coronation Drive, north of Seaton Carew	2002	12293	12960	12421	+4 %	14110
C	Hart Lane, west of Blake Street	2002	10667	11240	9383	+20 %	12250
A1086	Crimdon	2002	8539	9000	12614	-28 %	9800
A1049	West View Road	2002	7670	8080			8810
A178	Cowpen Marsh	2002	6270	6610	8338	-20 %	7200

APPENDIX 3
Part B Commercial / Small Industrial Processes

Process	Company	Location
Cement Process	RMC (Northern) Limited	Burn Road
Cement Process	Sherburn Stone Company Limited	Cleveland Road
Cement Process	Tarmac Northern Limited	Brenda Road
Coal Process	Jacksons Fuel Holdings Limited	Baltic Street
Coal Process	M & G Fuels Limited	Middleton Road
Coal Process	Tees & Hartlepool Port Authority	Cleveland Road
Coating Process	BBA Friction	Oakesway Trading Estate
Coating Process	BS Ramco Pipeline Services Limited	Brenda Road
Coating Process	Corus UK Limited	Brenda Road
Coating Process	Corus UK Limited	Brenda Road
Coating Process	Industrial Building Components Limited	Longhill Industrial Estate
Crematorium	Hartlepool Borough Council	Tanfield Road
Galvanising Process	Lionweld Kennedy Limited	Brenda Road
Milling Process	Omya UK Limited	Middleton Road
Petrol Service Station	Asda Hartlepool Petrol Filling Station	Marina Way
Petrol Service Station	FINA plc	Park Road
Petrol Service Station	FINA plc	Powlett Road
Petrol Service Station	FINA plc	Stockton Road South
Petrol Service Station	Malthurst Limited	Belle Vue Way
Petrol Service Station	Ron Perry & Son Limited	A19 Services South, Elwick
Petrol Service Station	Ron Perry & Son Limited	A19 Services North, Elwick
Petrol Service Station	Save Service Station	Mainsforth Terrace
Petrol Service Station	Shell Warren Service Station	Easington Road
Petrol Service Station	Tesco Stores Limited	Belle Vue Way
Petrol Service Station	Thrust Service Station	Wynyard Road
Printing Process	Britton Decoflex Limited	Skerne Road
Quarry Process	Hart Aggregates Limited	Hart Quarry
Reheating Process	Corus UK Limited	Brenda Road
Respraying Process	Parsons Truck Centre Limited	Brenda Road
Timber Process	FJ Reeves Northern Limited	Brenda Road
Timber Process	Industrial Building Components Limited	Longhill Industrial Estate

20 Processes

11 Petrol Stations

APPENDIX 4
Part A Large Industrial Processes

File	Company	Site	Comment
AK 8929	Baker Petrolite Ltd	Graythorp	No significant emissions
AK 8937	Baker Petrolite Ltd	Graythorp	No significant emissions
AK 8953	Baker Petrolite Ltd	Graythorp	No significant emissions
AF 3686	British Energy Generation Ltd	Seaton	No significant emissions
AO 0741	CJC Chemicals & Magnesia Ltd	Hart Warren	Small sulphur dioxide emitter
AK 7361	Eastman Co UK Ltd	Hunter Ind Est	No significant emissions
AI 9508	Oxford Chemicals Ltd	Zinc Works Road	No significant emissions
AQ 6333	Oxford Chemicals Ltd	Zinc Works Road	No significant emissions
AK 7701	Palmer (UK) Ltd	Tofts Ind Est	No significant emissions
AF 5590	Phillips Petroleum Co (UK) Ltd	Greatham	Large VOC emitter with some benzene
AA 2305	Tioxide Europe Ltd	Greatham	Combustion plant, low sulphur dioxide
AL 8363	Tioxide Europe Ltd	Greatham	Large Carbon Monoxide emitter

Total Processes - 12

References

Reference 1	Air Quality in the Tees Valley 1999 – 2002	published by the TVEPG, May 2003
Reference 2	Tees Valley Transport Strategy 2001 – 2006	published by the Tees Valley JSU, 2002
Reference 3	Impact of industrial sulphur dioxide emissions on the 15 minute objective in the Tees Valley	published by the TVEPG, May 2003

Contact :

Adrian Hurst
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Hartlepool Borough Council
Civic Centre
Hartlepool, TS24 8AY

Telephone – 01429 523323 Fax – 01429 523308 e-mail – adrian.hurst@hartlepool.gov.uk

Answers to Environment Agency Questions

The Environment Agency are continuing to focus on working with Van Dalen to prevent or, where that is not reasonably practicable, to minimise emissions from their site operations. Together with the operator we will review if monitoring could be applied to the site to produce useful and representative assessments of any emissions from their specific operations. The situation is a complex one in that the Van Dalen site is immediately surrounded by other Port operations that have the potential to produce dust. Monitoring by the local authority has focused on the area where impacts are reported to be experienced rather than any single potential source.

1) What has the E.A done to reduce the exposure routes to residents regarding depositing dust in the dock being dredged then dumped at sea causing exposure to edible fish stocks?

The disposal of dredgings at sea is carried out under licence issued by the Marine and Fisheries Agency. The Environment Agency has no powers to deal with this issue.

2) M17 Environment Agency Technical Guidance Document for monitoring of particulate matter in ambient air around waste facilities (including metal recycling / scrap yards) regarding dirty / dusty / noisy port operations residents would like a copy of all evidence that all of the legislative framework has been adhered too, which includes air quality management legislation, environmental protection legislation, health and safety legislation, planning and environmental legislation (only applies to the legislation governing the E.A). Would like a copy of all testing / results / investigations to prove it has been carried out.

In respect of the operations at Hartlepool docks, the Environment Agency enforce waste management and water pollution control legislation. Waste management legislation provides the Environment Agency with powers to regulate the impacts of waste management operations on the environment and human health, and on Hartlepool docks is applied solely to the operations of Van Dalen who are the only company operating a waste management activity. In assessing the effects to human health we work closely with local authorities, HSE, HPA and PCT's and are informed by their investigations and findings.

The Environment Agency do not enforce separate air quality management legislation but have regard to relevant air quality standards that these may contain. Local Air Quality Control legislation is ordinarily a matter for the local authority. We do not enforce Health and Safety legislation which is the remit of the HSE. We do not enforce planning legislation which is a matter for the Local Planning Authority.

The findings from our inspections and audit of the permitted waste activity since the permit was issued are in the attached reports.

The findings of investigations of reports of environmental incidents can be provided but will take more time to extract and provide. To minimise the time to provide this information it would be helpful if the time period the request refers to could be provided.

3) M17 gives an example of a scrap yard may be considered a hazard due to the potential impact of toxic heavy metals The correspondence risk might be that there is a 1 in 100 chance per year that residents in nearby houses would receive a significant exposure to say Nickel. Residents would like to see the results of all checks carried out on incoming scrap to check for contamination of harmful elements â€“ including PCBâ€™s / Cadmium / mercury / copper / aluminium / zinc etc and their components.

The Environment Agency does not routinely sample and analyse waste entering waste management facilities and has no analytical information on the quality of waste entering the Van Dalen facility. The types of waste that can be received are set out in the standard permit issued to the company. The activities permitted by this standard permit have been risk assessed nationally and the controls deemed appropriate.

4) What have the E.A done about run off from the area into Victoria Harbour residents would like to see the report? Residents would like to see the results from tests carried out on the environmental impact of the dust into the water affecting sea life?

The Environment Agency has inspected the site regularly and has not as yet identified any contaminated runoff discharging from the port area into the dock, however the layout of the dock has the potential for this to occur. We have confirmed a report of a scum on an area of the dock adjacent to the small boat jetties but the source of this is unconfirmed. We have collected samples on two occasions from the dock and provide the results attached.

Van Dalen have begun the installation of a kerb around the base of their storage area to prevent runoff from their site. On a wider basis PD Ports employ a road sweeper and have vehicle washing facilities to minimise the risk of polluting runoff entering the dock. Together with Hartlepool Borough Council we will meet with PD Ports in the coming weeks to review their arrangements for minimising the potential for runoff from their site.

5) Obviously Petri dishes are not the most suitable method for monitoring? They are not showing what the DVD is showing. M17 states that a Pilot Survey is used to confirm that the anticipated monitoring method will be adequate in terms of performance. Residents would like to see results of pilot survey?

M17 is a guidance document and does not set out requirements. The documents states at introduction, "This document does not state definitive best available techniques (BAT) or the most appropriate measures to prevent pollution of the environment or harm to human health. Instead, the intention is to provide information to aid the selection of a suitable monitoring method for a given application".

"The term 'monitoring' encompasses both quantitative measurements of particulates, and semi quantitative or even subjective assessments (e.g. visual dust assessments). However, this guidance focuses on quantitative measurements of particulate matter and, although it provides background information on risk assessment, this documents purpose and focus are confined to monitoring " .

The Environment Agency has not conducted any quantitative air quality monitoring of the Van Dalen site or its surrounding area. Van Dalen have commissioned some air quality monitoring which was summarised in the report by their consultants Envoy.

The Van Dalen site is surrounded by Port activities that could potentially result in dust emissions. We are aware that Hartlepool Borough Council have carried out monitoring in the wider area and are liaising closely with the relevant department on this issue. We are aware that Hartlepool Borough Councils monitoring to date has not identified any exceedance of the 50 or 40 ug/m3 standards referred to in M17 and identified only trace presence of some metals on some occasions.

Visual dust assessments are made during planned and reactive visits to Van Dalen and relevant findings are included in the inspection report.

6) As M17 has the first choice for method and technique for each determinand been used e.g deposited dust recommendation Frisbee omni-directional deposit gauge along all site perimeters, minimum of 2 along each boundary If not, why not?

As question 5

Multi-Agency Liaison Meeting

CONTACT LIST

Member of the Public 40 Town wall, Hartlepool.	Member of the Public 3 Town Wall, Hartlepool. TS24 0UQ
Member of the Public 23 Town Wall, Hartlepool. TS24 0JQ	Member of the Public 26 Town wall, Hartlepool. TS24 0JQ
Councillor John Marshall 22 St Helen's Street, Hartlepool. TS24 0EW Tel: 01429 280048 Email:john.marshall@hartlepool.gov.uk	**Councillor Stephen Allison** 7 Beaconsfield Square, Hartlepool. TS24 0PA Tel: 07900803052 Email: steve.allison@hartlepool.gov.uk
Principal Environmental Health Officer Environmental Protection Team Hartlepool Borough Council TEL: 01429 523323	PD Teesport Operations Manager Dock Offices, Cleveland Road, Hartlepool. TS24 0UZ TEL:01429 427403
Site Manager Van Dalen UK LTD Irvines Quay, Hartlepool. TS24 0UZ TEL: 01429 894100	Regional Manager Van Dalen UK LTD Irvines Quay, Hartlepool. TS24 0UZ TEL: 01429 894100
H&S Manager Van Dalen UK LTD Irvines Quay, Hartlepool. TS24 0UZ TEL: 01429 894100	HM Inspector of Health & Safety Arden House, Regent Centre, Gosforth, Newcastle-upon-Tyne. NE3 3JN TEL: 0191 202 6295
HM Inspector of Health & Safety Arden House, Regent Centre, Gosforth, Newcastle-upon-Tyne. NE3 3JN TEL: 0191 202 6295	Environment Agency Swan House, West Point Road, Thornaby TS17 6BP TEL: 08708 506506

Environment Agency Swan House, West Point Road, Thornaby TS17 6BP TEL: 08708 506506	**Environment Agency** (Reports on waste management facilities) 24Hrs contact for incidents TEL: 0800807060
envoy Environmental Consultants 12 Cherry Hills, Barnsley S75 5NZ TEL: 0797 975 8080	Acting locally Director of Public Health Hartlepool Primary Care Trust & Hartlepool Borough Council Civic Centre Hartlepool TEL: 01429 285079
Health Protection Agency North East Regional Office E Floor Milburn House Dean Street, Newcastle-upon-Tyne NE1 1LF TEL: 0191 261 2577	Co. Durham & Tees Valley Health Protection Team Appleton House, Lancaster Road, Durham DH1 5XT TEL: 0191 333 3372

creat... a better place

Environment Agency

Our ref: NC09-604

Date: 05 August 1009

Dear Cllr Marshall

Thank you for taking the time to talk to me on the telephone yesterday. Following our conversation, I have enclosed a copy of the Waste Management Licence (WML) (now referred to as an Environmental Permit), the Waste Management Licence Decision Document and Compliance Plan, and the Environmental Management System supplied to us by Van Dalen UK Ltd.

No Environmental Impact Assessment (EIA) was carried out prior to the determination and issue of this WML. It is the Planning Authority that would require an applicant to provide an EIA using the Town and Country Planning (Environmental Impact Assessment) (Amendment) (England) Regulations 2008. EIA is a procedure that must be followed for certain types of development before they are granted development consent. The contents of the Environmental Statement that is submitted must be taken into account by the Planning Authority before it can grant development consent. However, in certain cases, where land use may have pre-dated the requirement for planning legislation and further planning consent need not be applied for, an EIA cannot be required.

Under any circumstances, the Environment Agency cannot require an EIA to be provided but an Environmental Risk Assessment (ERA) is required for non-standard applications. As the application by Van Dalen UK Ltd was bespoke, they provided us with an Environmental Management System that identified the risks and control measures that would minimise any impacts.

I have also enclosed our standard Non-Commercial Notice that outlines what you may use the information for.

Yours sincerely

PAULA BUCHAN
External Relations Team Leader

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INVESTOR IN PEOPLE

Waste Management Licensing

Bespoke

Licence Decision Document and Compliance Plan

1. Introduction

Area: Dales	Determining NPT: Warrington
Region: North East	Determining officer: Rachel Brakes/Judith Ford

EAWML Number	100226
Facility Name	Irvins Quay
Facility Address including NGR	Hartlepool Export Terminal, Hartlepool, Cleveland TS24 0UZ
Applicant/Licence Holder (**Transfers only**: include details of transferor *and* transferee)	Van Dalen UK Limited
Status of Applicant	Company
Registered Office Address (**Transfers only**: include details of transferor *and* transferee)	8 Grange Mill Lane Sheffield South Yorkshire. S9 1HW
Company Number (if applicable) (**Transfers only**: include details of transferor *and* transferee)	04031206
Correspondence Address	As above
What activities will be authorised by the licence	Keep
For modifications only, what are the activities authorised by the existing Licence	N/A
Facility Type (OPRA category)	A20
Full Charging Table Reference	Table 2 part C, b,iv

Inspecting Officer	**Note:** if the licence is pre-operational and hence is not incurring subsistence charges, it is the Inspecting Officer's responsibility to trigger the start of Subsistence Charges by informing Income Teams.

- The permitted activities are storage of furnace ready scrap metal and general scrap metal for recovery.
- The site has previously been in use for storage prior to export of scrap metal . The bund on Irvines quay has been in constant use for storage prior to loading onto vessels.

2. Receipt of submission

Calculation of fee paid and correct Charging Table:

A sum of £6,482 was received which is the correct amount under charging table band(s) Table 1, part A, c, iv (2007/08 Charging Scheme) . An additional fee for technical competence assessment was also provided £346 and £116 for an additional candidate

Claims for commercial confidentiality.
Under Section 66 (1) of The Environmental Protection Act 1990 (the Act), the person furnishing information, for the purpose of an application or for the modification of a licence, can apply to the Agency to have that information excluded from the public register on the grounds that it is commercially confidential.

- No Claim made

Occupancy
Occupancy has been confirmed by the applicant 22 December 2008 – lease agreement provided and confirmed satisfactory by legal.

3. Consultation & Other Representations

Comments and actions
Appendix 1 details the comments received from consultees and any other representations, and the actions subsequently taken by the Permitting Officer to address these comments.

Consultation and Compensation Provisions (applications for new licences and modifications to licence conditions only)
Not applicable.

Planning Status
Planning Status for storage of scrap metal waste only, confirmed by planning authority (Robin Newlove) via email 26 June 2008.

Habitats Directive / SSSI
Teesmouth and Cleveland Coast SPA and RAMSAR site are within 1 km of the site . Natural England were consulted and concluded that the site would not adversely effect the site. An assessment concluded that there would be no adverse impact on the SSSI and therefore Appendix 11 was completed as a record of assessment and saved on EDRM.

4. Licence Conditions

The licence was drafted using a consolidation of metal recycling and storage of furnace ready scrap metal fixed licence conditions. The licence has been amended to remove the treatment activities and references authorising treatment in the permit introductory note following consultation with the planning authority and confirmation that planning (generally permitted development) would only cover storage of scrap metal wastes.

The licence does not permit burning of any wastes in the open inside the buildings or in any form of incinerator.

We are aware there is a dust issue on the site and at the request of the Area staff and in agreement with the applicant we imposed further conditions from the standard rules set for Furnace Ready Scrap.

3.3.2 The operator shall:
(a) if notified by the Agency that the activities are giving rise to pollution, submit to the Agency for approval within the period specified, a fugitive emissions management plan;

(b) implement the approved fugitive emissions management plan, from the date of approval, unless otherwise agreed in writing by the Agency.

We have included a limit on permitted activities so that no waste shall be stored in the area coloured green on the site plan in schedule 1 to this licence. The licence holder's lease does not allow the storage of waste within the area shaded green and in consultation with legal colleagues we have used this limit.

5. Fit and Proper Status

Assessment of Relevant Convictions
All known sources have been checked to ensure that all relevant convictions have been declared.

The Operator has declared relevant convictions , these have been assessed in accordance with Work Instruction 194_03 Assessment of relevant convictions and Guidance document on relevant convictions 483_05.

A post conviction plan was provided by the applicant and the Agency's principal solicitor consulted. The applicant was considered to fall into the 'concern category' on the a basis that 'all convictions since 1 July 2003 have been addressed by the PCP . Therefore on issue of the licence a 'concern' letter will be sent out in accordance with the work instruction 194_03

Assessment of Technical Competence:

1. Certification level.
Non WAMITAB site

2. Nominated Managers.
John Irvine and Nigel Boothby – Agency assessment satisfied 03/06/08

3. Site attendance.
To be calculated by Area

Financial Provision
Regional Finance has confirmed that the applicant has demonstrated that adequate finances are available to meet the obligations of the licence in the memo dated 19 June 2008 from Geoff Painter.

6. Duly made and Extension dates

		Date
Duly made?	The duly made date for this application is:	18/10/07
Determination extension needed?	On 23 January 2009 the applicant agreed a final extension to the determination date (verbally) until:	28 January 2009

7. Decision

It has been decided that this application should be granted

i) **Signed** Pford

Designation: Permitting Officer **Date:** 23 January 2009

This application has been peer reviewed and, based on the above information, the reviewer agrees with the determining officers decision.

ii) **Signed:** E. Preston .....

Designation: ...Permitting Officer **Date**: 26/01/2009:

Decision document and determination of application approved by designated person under NFSoD

iii) **Signed:** ....

Designation: .....Team Leader..... **Date: 28/01/2009**

Consultees Responses

Comments from	Comment	Actions, or justification for none required
Planning Authority	No response Further response on 27 June 2008 – to confirm the site does not have permitted development for certain activities i.e. the treatment activities detailed in the draft licence. The planning authority object to the proposal. They have recommended either Van Dalen withdraw the application or amendment to the draft licence to exclude the treatment activities.	Van Dalen have amended the application to exclude treatment activities. The licence will only permit the storage of wastes metals.
HSE	HSE are concerned about the contamination of houses and surfaces with fine metal dust allegedly emanating from the movement of fragmented metal which is held in the Van Dalen site and transferred to ships.	Addressed also with additional conditions from the standard rules for Furnace Read Scrap requiring submission of a dust action plan and implementation. Regular meetings continue to be held between the applicant, LA, HSE, Primary Care Trust and Environment Agency. The applicant has carried out dust monitoring which indicates that some of the dust consists of titanium dioxide. The titanium dioxide is stored on the adjacent site and not associated with any of Van Dalens activities.
Applicant	No response	No actions

Area comments Nathan Atkinson 22 February 2008	Companies house registered address is incorrect it should be 8 Grange Mill Lane, Sheffield	This has been amended.
	Concern that there is a dust issue, also about any run-off should dust suppression be employed.	The licence contains high level conditions which state that fugitive emission shall not cause pollution. Addressed also with additional conditions from the standard rules for Furnace Ready Scrap requiring submission of a dust action plan and implementation.
	Concern that waste metal may fall via gap between dock and ship.	Applicant has provided details of control measures (e-mail 9 June 2008)
	Concern that site does not have sealed drainage system.	Applicant has provided drainage details for the site. The applicant is proposing only to accept clean uncontaminated dry wastes and therefore storage can be either on hardstanding or impermeable surface. The site is a combination of hardstanding and impermeable pavement , the impermeable pavement drains to a combined sewer which runs through the licenced area . The sewer service provided also serves the dock area. The operator has the right in their lease to use the drainage system.
		Drainage plan provided by applicant 9 June 2008.
Graeme Hull	There is no drainage plan	The site is only accepting ELVs which are drained of fluids.
	They have stated on the application form they will only accept metal , however they have included ELV's as a waste type.	The only tyres and tyre wires accepted on site will be from ELV's. The management system /plan should detail the storage and handling.
	Nothing is mentioned of tyres or tyre wire	We have included condition 3.2.2

	Can you insert conditions 3.2.1, 3.2.2 and 3.2.3 from standard rules SR2008No15 – material recycling facility (no building) to help us regulate this effectively.	from the standard licence for the storage of furnace ready scrap metal this allows the Agency to request an action plan and require implementation should there be fugitive emissions from the site . Permission obtained from process.
	There appears to be buildings within 500 metres. How does this affect the compliance risk assessment... do they have to take additional measures.	The compliance risk assessment is not affected by dwellings or workplaces being located within 200 metres of the site. The generic risk assessment for fixed condition metal recycling and storage of furnace ready metal does not require the operation to be greater than 500 metres away from dwellings or workplaces.
	To make the condition enforceable in any way condition 1.1.1 should be amended to require that the management system is written.	Guidance states that the management system should be written. We cannot change the wording of the condition accept with permission from process.
Head Office Port Authority	No response	No actions required
Natural England – A Whitehead 25/02/08	Concluded that the Habitats would not be adversely affected	No actions required
PD Teesport , Tees Dock, Middlesborough	No response	No actions required

Key Points for Consideration of Completed Decision Document

Application for a new licence

The decision document for a new licence should demonstrate that the following requirements of the Act have been met:

- *the licence holder will be a Fit and Proper Person, and*
- *will be in occupation of the licensed area (in the case of a site licence), or*
- *will be the operator of the plant (in the case of a mobile plant licence), and*
- *that the proposed use of the land has the benefit of an appropriate planning permission (where required), and*
- *that the activities, if conducted in accordance with licence conditions, will not cause pollution of the environment or harm to human health or, in cases where this is not covered by planning permission, serious detriment to the amenities of the locality.*

Modification of licence conditions

- *A notice of modification under Section 37(1)(b) of the Act can only modify conditions to the extent requested by the applicant. Where other conditions are to be modified or new conditions inserted as a result of the modification, each condition must be justified as being 37(1)(a) or 37(2)(a), and separate notices should be prepared where more than one section is being used.*

- *Planning permission is not a prerequisite to the issue of a modification notice, however the planning authority's views may be a key element in the determination of whether the modification may cause pollution of the environment, harm to human health or, where relevant, serious detriment to the amenities of the locality.*
- *Financial provision and technical competence should be in place to address any new obligations expected from the modification application.*

Transfer of licence

- *The grounds for determination of an application to transfer a licence are solely those that relate to the fit and proper person status of the proposed transferee.*

Surrender of licence

- *The decision document should indicate whether the condition of the land, in so far as that condition is the result of the use of that land for the treatment, keeping or disposal of waste (whether or not in pursuance of the licence), is likely or unlikely to cause pollution of the environment or harm to human health.*