
# LOCAL AIR QUALITY MANAGEMENT

# Progress Report 2005

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# North Norfolk District Council Air Quality Management Progress Report

## Introduction

The Local Air Quality Management Updating and Screening Assessment Produced in May 2003 found that all 7 pollutants were expected to meet the target values within the target deadline as defined by the Air Quality Regulations. Hence there has been no need to proceed to a Detailed Assessment for any of the 7 Pollutants.

Both the 2003, Updating and Screening Assessment and the 2004, Progress Report identified one $NO_2$ Hot Spot within North Norfolk, located in the village of Hoveton. Although the 2005 target was expected to be met it was thought that prolonged local highway maintenance directly affected the data. Therefore, further $NO_x$ tube monitoring was set up within the area to give a more detailed view. A new monitoring site was set up on the opposite side of the main road in the centre of the Hot Spot and a quality control site was located at the original location. The new monitoring locations have now been running for 12 months and have provided valuable data.

We have no local continuous monitoring data for particulates in North Norfolk. We have committed to an examination of particulate matter within North Norfolk as part of the progress report submitted to DEFRA in April 2004. We are currently waiting for the outcome of a capital funding application for equipment to undertake this work.

In March 2005 through continuous consultation a Portacabin for the housing of air quality instrumentation was donated to the authority by a consortium of oil and gas companies. The opportunity is being taken to provide a continuous monitoring site accredited to national standards where several pollutants can be measured at a rural background site. The site has previously been used for the continuous monitoring of $SO_2$ and $NO_X$ and this monitoring equipment was included in the donation.

The Updating and Screening Assessment suggested a degree of uncertainty as to whether the much more stringent, 2010 target value for $PM_{10}$ would be met. To address this uncertainty, a capital funding application has been submitted to DEFRA for a Tapered Element Oscillating Microbalance (TEOM). The data collected will form part of the next updating & screening assessment due in April 2006.

The main sources of benzene within North Norfolk are, The Bacton Gas Terminal, RAF Coltishall, Major roads and petrol filling stations. North Norfolk does not have any duel carriageways or motorways and there is no evidence to suggest that any area of North Norfolk would receive the volume of traffic required, to indicate a benzene problem. Further to this there is also no evidence to suggest that petrol filling stations throughput would be high enough to make a significant contribution.

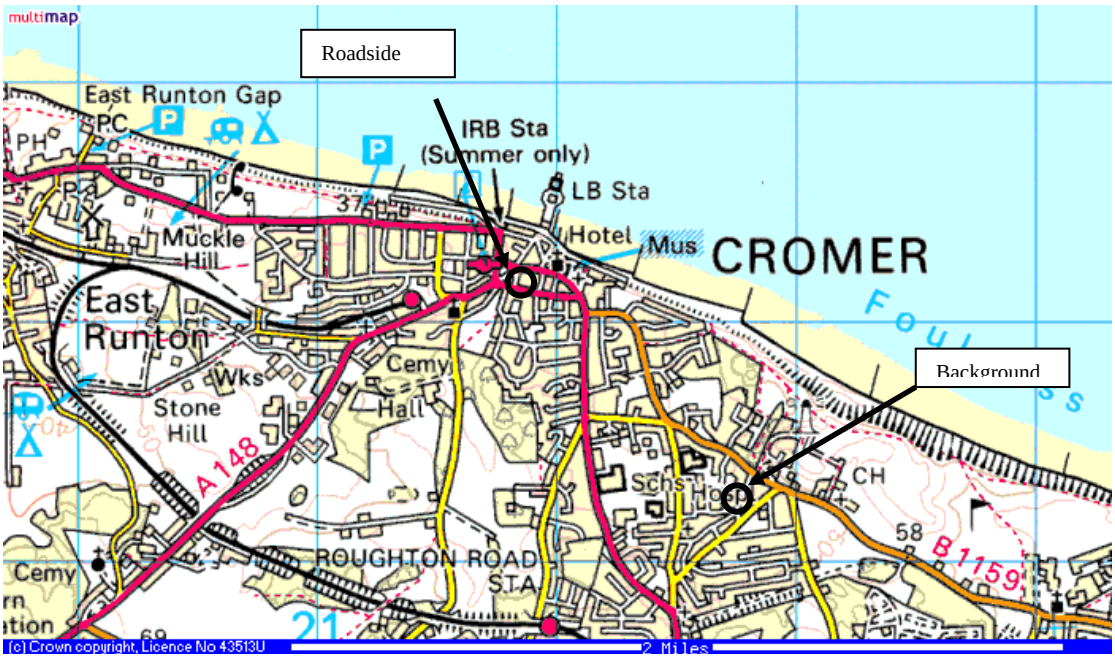
The 2003 Updating and Screening assessment identified a minor potential for the 2010 Benzene objective to be exceeded near the Bacton Gas Terminal and although this is unlikely due to continuing improvements since the last monitoring completed by the site in 1999, it was considered that further monitoring to confirm this may be required.

Netcen, (A UK leader in environmental professional and technical services who help Governments, Regulators and Industry develop, implement and operate pragmatic environmental solutions that help improve quality of life), estimated modestly higher background levels around the RAF Coltishall airfield. In view of the low number of aircraft flying out of RAF Coltishall, this is not expected to give any cause for concern. The Ministry of Defence has reported nationally that the number of squadrons operating and thus aircraft movements from the base is decreasing and the base will close fully in 2006. Therefore, for 2006/7 we have instigated a programme of benzene monitoring across the district at five sites using diffusion tubes.

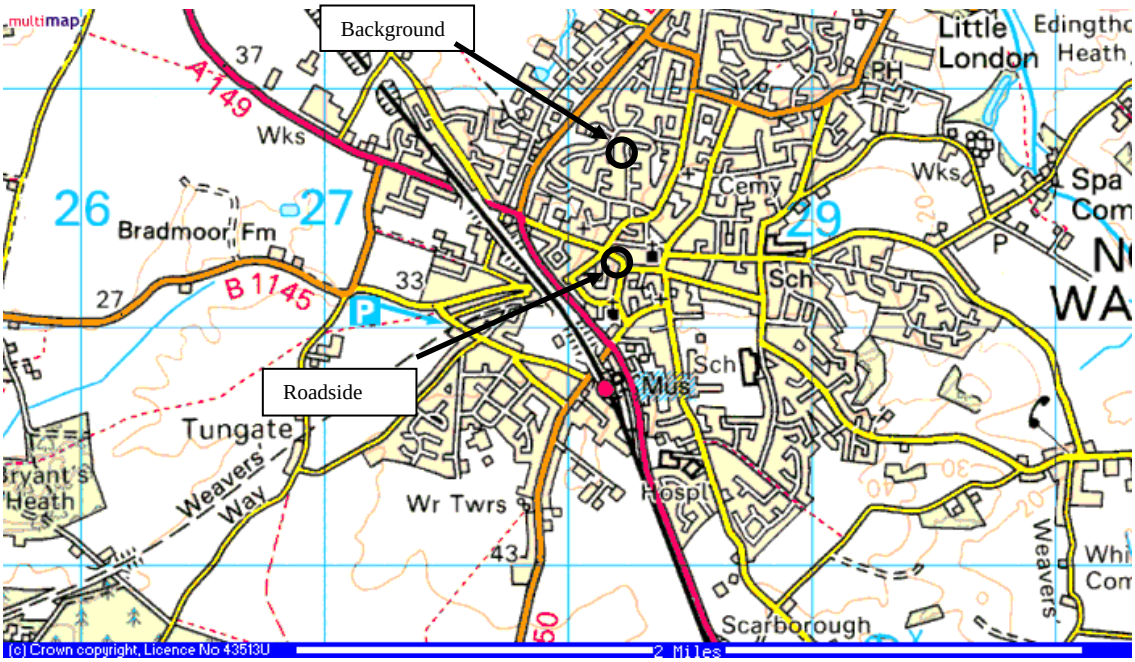
## Table 1. Monitoring Locations

| Site Name | Location | Determinand | Site Type | Mehtod | OS Grid Ref. |
|---|---|---|---|---|---|
| **Cromer 1** | 9 Hamilton Road, Cromer | NOx and Benzene | Roadside | Diffusion Tube | TG 217 422 |
| **Cromer 6** | 33 Cliff Road, Cromer | NOx | Background | Diffusion Tube | TG 227 412 |
| **North Walsham 8** | Angel Court, North Walsham | NOx and Benzene | Roadside | Diffusion Tube | TG 281 303 |
| **North Walsham 7** | 26 Corbett Road, North Walsham | NOx | Background | Diffusion Tube | TG 283 309 |
| **Fakenham 9** | Post Office, Queens Road, Fakenham | NOx | Roadside | Diffusion Tube | TF 921 296 |
| **Fakenham 9** | Post Office, Queens Road, Fakenham | NOx | Roadside | Diffusion Tube | TF 921 296 |
| **Fakenham 9a** | 33-35 Oak Street, Fakenham | NOx | Roadside AQC | Diffusion Tube | TF01868 29640 |
| **Fakenham 3** | Hillside Service Station (Shell), Creake Road, Fakenham | Benzene | Roadside | Diffusion Tube | TF91240 30686 |
| **Fakenham 4** | Fakenham Infants School, Norwich Road, Fakenham | NOx | Background | Diffusion Tube | TF 926 296 |
| **Hoveton10a** | Miss Roy Stalham Road, Hoveton | NOx and Benzene | Roadside | Diffusion Tube | TG303181 |
| **Hoveton10b** | Miss Roy Stalham Road, Hoveton | NOx | Roadside AQC | Diffusion Tube | TG309186 |
| **Hoveton 10c** | Roys Food Hall, Stalham Road, Hoveton | NOx | Roadside | Diffusion Tube | TG30155 18285 |
| **Hoveton 11** | Waveney Close, Stalham Road, Hoveton | NOx | Background | Diffusion Tube | TG31133 18622 |
| **Bacton 12** | Church Farm, Church Road, Bacton | NOx and Benzene | Background | Diffusion Tube | TG33344 33667 |
| **Bacton 13** | Church Farm, Church Road, Bacton | NOx | Background | Diffusion Tube | TG33344 33667 |
| **Bacton 14** | Church Farm, Church Road, Bacton | Nox, $SO_2$ | Background | Continuous | TG33344 33667 |

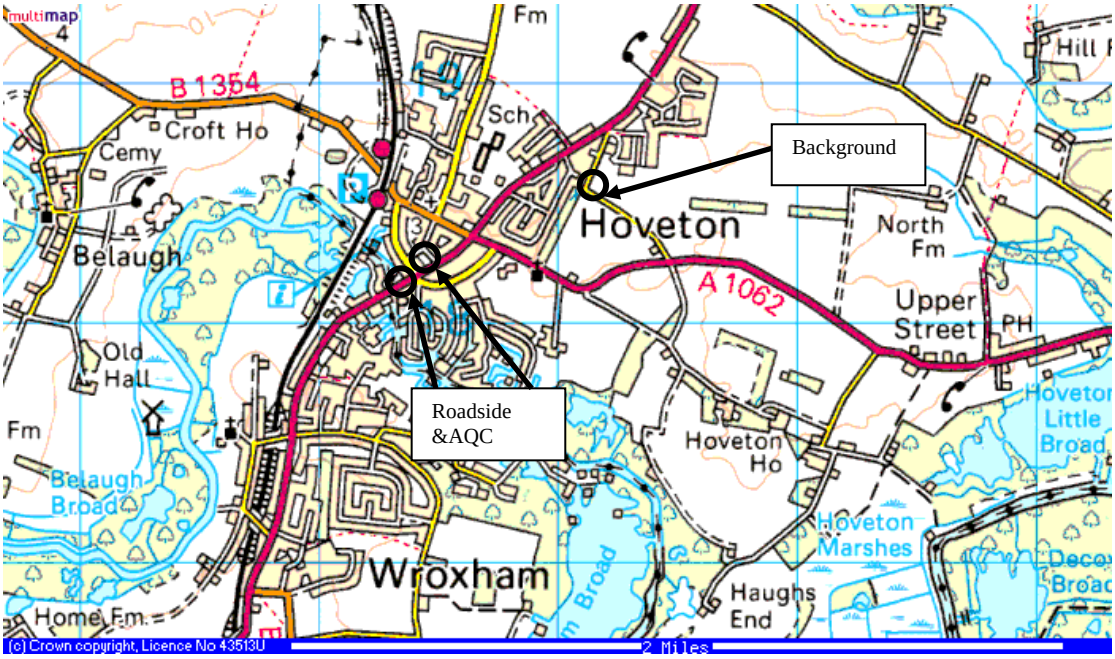
## Cromer



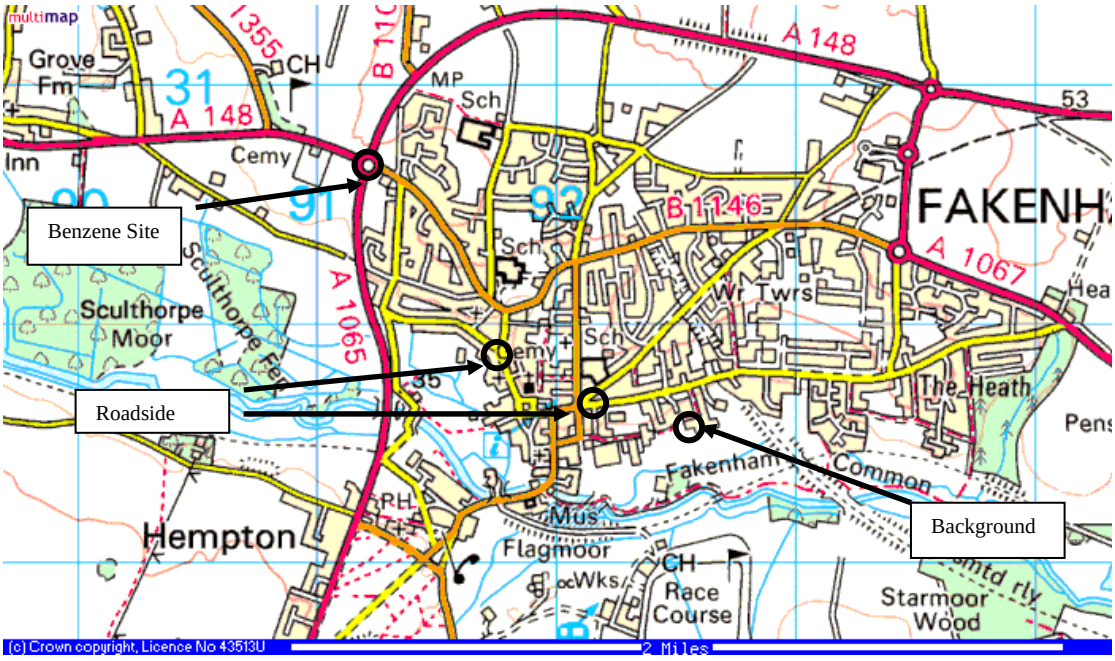

## North Walsham



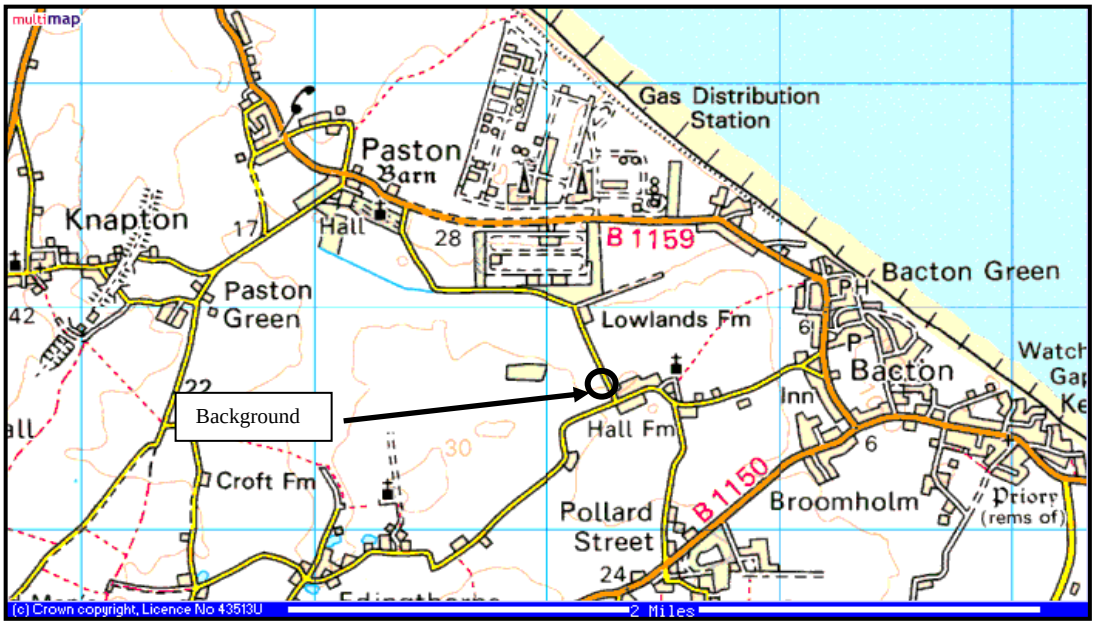
## Hoveton




## Fakenham



## Bacton




## Monitoring Data

### Table 2. Data Table for $NO_2$ Diffusion Tube Monitoring in North Norfolk

| | Mean 2002/ 2003 (µg $m^{-3}$) | Mean 2003/ 2004 (µg $m^{-3}$) | Mean 2004/ 2005 (µg $m^{-3}$) | Mean corrected 2004/5 (µg $m^{-3}$) | Mean Adjusted by continuous Data 2004/5 (µg $m^{-3}$) | Old prediction 2004/5 (µg $m^{-3}$) | New prediction From Corrected Data 2005/6 (µg $m^{-3}$) | New prediction from Adjusted Data 2005/6 (µg $m^{-3}$) |
|---|---|---|---|---|---|---|---|---|
| **Cromer 1** | 38.80 | 36.23 | 35.64 | 35.64 | 33.00 | 33.35 | 34.57 | 32.01 |
| **Cromer 6** | 17.60 | 18.75 | 16.46 | 16.46 | 15.24 | 17.26 | 15.96 | 14.78 |
| **North Walsham 8** | 35.25 | 36.8 | 31.00 | 31.00 | 28.70 | 33.87 | 30.07 | 27.84 |
| **North Walsham 7** | 21.75 | 26.18 | 16.51 | 16.51 | 15.28 | 24.1 | 16.01 | 14.82 |
| **Fakenham 9** | 28.88 | 30.75 | 28.92 | 28.92 | 26.78 | 28.3 | 28.05 | 25.96 |
| **Fakenham 9a** | - | - | 20.07 | 20.07 | 18.58 | - | 19.47 | 18.2 |
| **Fakenham 4** | 14.93 | 15.25 | 13.69 | 13.69 | 12.67 | 14.04 | 13.28 | 12.29 |
| **Hoveton10a** | 46.29 | 40.95 | 39.37 | 40.35 | 37.36 | 37.7 | 39.13 | 36.23 |
| **Hoveton10b** | - | - | 38.15 | 38.15 | 35.32 | - | 37 | 34.26 |
| **Hoveton 10c** | - | - | 36.53 | 36.53 | 33.82 | - | 35.43 | 32.8 |
| **Hoveton 11** | 27.36 | 24.61 | 17.59 | 17.59 | 16.29 | 22.65 | 17.06 | 15.8 |
| **Bacton 12** | - | - | 14.41 | 14.41 | 13.34 | - | 13.98 | 12.94 |
| **Bacton 13** | - | - | 14.80 | 14.80 | 13.70 | - | 14.35 | 13.29 |

The data for the monitoring site ‘Hoveton 10a’ has been corrected to account for an anomaly which gave a suspiciously low rating for September. The AQC site Hoveton 10b and the nearby comparison site Hoveton 10c, both showed concentration for September to follow the general annual trend. As a result the suspicious data has been excluded form the dataset and the remaining data for Hoveton 10a has been averaged over 11 months.

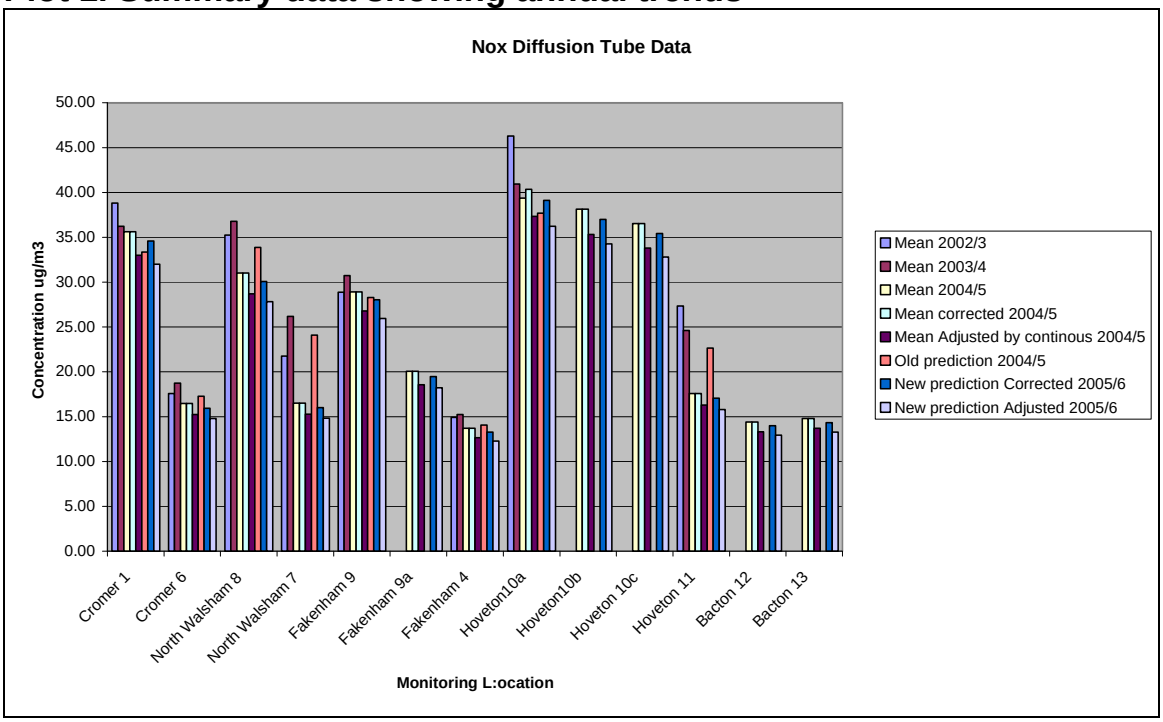
There has been continuous monitoring for several years at Church Farm Bacton for $SO_2$ AND $NO_X$ with periodic monitoring of $PM_{10}$.

**Table 3.Monitoring at Church Farm near the Bacton Gas Terminal between 25 November 1998 to 05 March 1999**

| POLLUTANT | $PM_{10}$* | $NO_2$ | $SO_2$ |
|---|---|---|---|
| Number Very High | - | 0 | 0 |
| Number High | - | 0 | 0 |
| Number Moderate | - | 0 | 0 |
| Number Low | - | 2328 | 9302 |
| Maximum 15-minute mean | 130 µg $m^{-3}$ | 84 µg $m^{-3}$ | 64 µg $m^{-3}$ |
| Maximum hourly mean | 74 µg $m^{-3}$ | 69 µg $m^{-3}$ | 59 µg $m^{-3}$ |
| Maximum running 8-hour mean | 57 µg $m^{-3}$ | 63 µg $m^{-3}$ | 25 µg $m^{-3}$ |
| Maximum running 24-hour mean | 40 µg $m^{-3}$ | 53 µg $m^{-3}$ | 19 µg $m^{-3}$ |
| Maximum daily mean | 39 µg $m^{-3}$ | 44 µg $m^{-3}$ | 17 µg $m^{-3}$ |
| Average | 19 µg $m^{-3}$ | 17 µg $m^{-3}$ | 4 µg $m^{-3}$ |
| Data capture | 92.8 % | 96.0 % | 96.2 % |

**Produced by Netcen on behalf of Bacton Environmental Forum, this data have been fully ratified by Netcen**

## Plot 1. Summary data showing annual trends




Gradko Bias data for this year has not been available. As a result it has been necessary to calculate a bias factor using continuous monitoring data provided from the Church Farm, Bacton monitoring station. Both diffusion tube and continuous data (for the exposure date and time periods) from the Bacton station has been averaged and the ratio between the continuous data and diffusion data has then been used to adjust the data for the other monitoring locations.

The predicted concentration for the next year have then been calculated using the Netcen Air Pollution - Year Adjustment Calculator (v1.1a)

The raw data for the Hoveton 10a site shows an average concentration of 39.37 **(**µg $m^{-3}$) this falls under the average objective. However, the result for September was much lower than expected and lower than the AQC data (Hoveton 10b) As a result the September result has been excluded from the dataset and the new annual average result is 40.35µg $m^{-3}$. Although this corrected average data is above the objective it has been shown through the Netcen Year Adjustment Calculator and the general reduction trend in the data across all sites that the concentration will decrease naturally and it is not expected to exceed the 2010 objective without intervention.

## New Development

North Norfolk District Council recently gave planning permission for a new Tesco superstore in Fakenham. Although it is not expected to increase traffic to levels that would lead to an air quality issue, the access road to the store will go through a pinch point or narrow road. Furthermore, the development will require this road to be narrowed further. As a result a diffusion tube (Fakenham 9a) has been located next to the pinch point to monitor the situation throughout the development and when the store opens to the public.

In the past twelve months there has been no new development that would affect the air quality within our neighbouring authorities. North Norfolk District Council has not received any information to suggest any development within our neighbouring authorities that would affect the air quality in North Norfolk.

It is thought that there are several long-term projects that require further investigation such as the development of the new outer harbour in Yarmouth and the development of a new wind farm. It is thought that the investigation should include the infrastructure associated with the construction and movement of vehicles during the construction.

## Progression

Close monitoring of Nox at Hoveton will continue throughout 2005 to ensure that the objectives are met.

Having taken over the Bacton air quality station in March 2005, North Norfolk District Council will continue with continuous monitoring of NOx and $SO_2$ at the site. If our bid for Capital funding from DEFRA is approved we will install the TEOM (tapered element oscillating microbalance, a true microweighing technology that provides true mass measurements of atmospheric particles. Using a choice of sample inlets, the hardware can easily be configured to measure PM-10, PM-2.5, PM-1 or TSP concentrations), into the station at the earliest opportunity. We are using the Bacton site as a co-location site for both

NOx and benzene diffusion tubes. This will allow us to assess the accuracy of the NOx diffusion tube and also provide a base line background site for all the monitoring

Other Local Authorities in Norfolk and the University of East Anglia (Dr Stephen Dorling) have expressed interest in the site to providing local data to enable comparisons to be made with other sites across the county to assist with air quality management.

Given the proposed location of the site, collection of particulate samples is proposed with a view to speciation being undertaken in partnership with other studies on sources and behaviour of particulate pollution. Further to this we are in consultation with our neighbouring authorities and the University of East Anglia to have a joint website providing up to date information on a countywide basis.

In order to confirm there is no requirement for detailed monitoring of Benzene it was decided to instigate a general Benzene Diffusion tube monitoring programme. Five sites have been selected on the basis of traffic movement combined with emissions from petrol filling stations or potential risk of public exposure. The site varied from the Bacton Gas Terminal to busy roadside sites and major junctions adjacent to petrol filling stations. The diffusion tube monitoring was initiated to coincide with the start of the 2005 – 2006 monitoring programme in April 2005. The monitoring will continue for 12 months at which point the data will be reviewed as part of the 2006 Updating and Screening Assessment.