Detailed Assessment
Air Quality Management Area declared at The Dooley Inn PH, Ferry Lane, Felixstowe

November 2015

Prepared by Transport Research Laboratory under contract to Suffolk Coastal District Council.

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Date	25th November 2015

This is a Detailed Assessment for the Air Quality Management Area (AQMA) declared at The Dooley Inn, Ferry Lane, Felixstowe. The Detailed Assessment has been produced by Transport Research Laboratory under contract to Suffolk Coastal District Council to determine whether revocation of the AQMA is required.

The Detailed Assessment recommends that the Felixstowe AQMA should be revoked. Suffolk Coastal District Council agrees with these findings.

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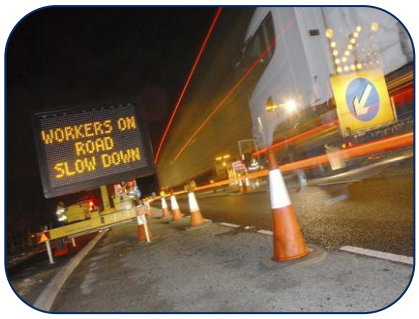


CLIENT PROJECT REPORT CPR2113

Felixstowe Air Quality Detailed Assessment

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Project Ref:

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Contents amendment record

This report has been amended and issued as follows:

Version	Date	Description	Editor	Technical Referee
1	Aug 2015	First draft for client comment	AS	TB
2	Oct 2015	Final report for submission to Defra	AS	KT

Executive Summary

This detailed assessment report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act 1995 [1], the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 [2] and the relevant Policy and Technical Guidance documents [3&4].

This detailed assessment focuses on the Felixstowe Air Quality Management Area (AQMA) which was declared in 2009 due to exceedences of the air quality objective for annual mean nitrogen dioxide (NO_2) at the Dooley Inn public house, Ferry Lane. Relevant exposure for the annual mean objective exists for three people living above the pub. Since this declaration, measured annual mean concentrations have declined in the AQMA. This detailed assessment therefore aims to demonstrate with confidence that the air quality objective is now met within the Felixstowe AQMA and that there are unlikely to be any exceedences in the future. The local authority considers that there is no longer any risk to health due to air quality exceedences.

The detailed assessment provides evidence from local and national monitoring sites that there has been a downward trend in NO_2 concentrations over the last three to five years. There have been no measured exceedences of the air quality objective in the Felixstowe AQMA since 2011 and based on the trend data and ongoing work to control the key sources of emissions, it is expected that this downward trend in NO_2 concentrations will continue. The detailed assessment demonstrates that annual mean NO_2 concentrations decrease with increasing distance from the sources associated with the port and Dock Gate 2 and are below the objective at residential properties.

Since the publication of the final air quality action plan in 2012, there has been an increase in port throughput. However, the local authority and Port of Felixstowe have been proactive in working together to implement measures to reduce emissions from activities on the port and emissions from heavy duty vehicles (HDVs) accessing the port – the two major source contributions to emissions. These measures include:

- Use of more smaller, more efficient and electric Rubber Tyred Gantry (RTG) cranes to replace the existing larger diesel cranes;
- Purchase of newer internal movement vehicles fitted with selective catalytic reduction to meet newer emission standards;
- Reduction of emissions from HDV traffic using the port via Dock Gate 2 through better management of arrivals, increased use of rail for freight movements and increased used of Dock Gate 1 which is further away from relevant receptors.
- Improvements to shipping including increasing the berth sizes to allow larger, more efficient ships to use the port and investigating the potential for ships to run on liquefied natural gas in berth rather than diesel.

Information on a number of proposed business developments in the area are also given in the detailed asssessment. Although these developments may increase the number of HDVs in the area, it is expected that there will not lead to a significant future increase in annual mean NO_2 concentrations.

The detailed assessment recommends that the Felixstowe AQMA should be revoked. Suffolk Costal District Council agrees with this recommendation and will consult with Defra and other statutory bodies regarding this decision.

Contents

1 Purpose and Background of the Report

1.1 Purpose of Detailed Assessment

This detailed assessment report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act 1995 [1], the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 [2] and the relevant Policy and Technical Guidance documents [3&4]. As part of the LAQM process, all local authorities have a statutory obligation to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedances are considered likely, the local authority must then declare an AQMA and prepare an Air Quality Action Plan setting out the measures it intends to put in place in pursuit of the objectives.

This detailed assessment focuses on the Felixstowe Air Quality Management Area (AQMA) which was declared in 2009. The report aims to demonstrate with confidence that the air quality objective to meet 40 μg/m^3 for annual mean nitrogen dioxide (NO_2) is now met within the Felixstowe AQMA and there are unlikely to be any exceedences in the future. The report concludes that the local authority can now revoke the AQMA order as there is no longer any risk to health due to air quality exceedences.

1.2 Background to Local Air Quality Management in Felixstowe

Suffolk Coastal District Council has completed five rounds of air quality review and assessment and has recently submitted their 2015 Updating and Screening Assessment (USA) report as part of Round 6.

During the third round, their 2006 USA report identified a potential risk of exceedence of the air quality objectives for nitrogen dioxide (NO_2), fine particulates (PM_{10}) and sulphur dioxide (SO_2) resulting from emissions from activities on and associated with the Port of Felixstowe. Following completion of a Detailed Assessment in 2008 for Adastral Close and Ferry Lane in Felixstowe, an AQMA was declared on 1 May 2009 for exceedence of the annual mean NO_2 objective concentration in the vicinity of the Dooley Inn Public House on Ferry Lane, Felixstowe. The AQMA boundary is shown in Figure 1, indicated by the hatched area in the centre of the figure. Relevant exposure to concentrations above the objective is limited to three people living in two flats above the Dooley Inn.

The local authority conducted a Further Assessment [5] and produced a Draft Air Quality Action Plan in 2010 for the Felixstowe AQMA. Source apportionment found that the main NO_x contribution was from emissions from container handling and vehicle activities in the Port, together with emissions from Heavy Duty Vehicles (HDVs) on roads outside the Port boundary. The final Action Plan was completed in 2012 [6].

As part of the fifth round of review and assessment, the 2014 annual progress report concluded that the annual mean NO_2 concentrations had been below the objective within the AQMA for the last two years [7]. This trend was continued in 2014, and the recent 2015 USA report identified that this objective had been met for three years [8]. The Port of Felixstowe has introduced a number of measures which have led to a significant reduction in NO_x emissions. The USA report therefore concluded that a detailed assessment would be undertaken to determine whether the Felixstowe AQMA can be revoked.

2 Monitoring Data

2.1 Site Details

Suffolk Coastal District Council monitor at a large number of diffusion tube sites within their district. The diffusion tube sites that are located closest to the Felixstowe AQMA are indicated in Figure 1 and Table 1. Data from these sites are provided in Section 2.1 with a discussion of trends presented in Section 3 of the report.

There are nine monitoring locations operated by the local authority in the vicinity of the AQMA. Three of these sites have triplicate diffusion tubes (FLX 26, 27 and 32) and are located within the AQMA itself. A further six sites (FLX 33, 34, 35, 36, 37 and 38) are not located at relevant receptors (i.e. residential properties) – see Figure 1. The local authority installed these additional sites in 2011 to help them determine NO_2 levels in the locality of the declared AQMA and to provide additional information on local sources of NO_x emissions close to the Dooley Inn. As well as the local authority sites, there are nine diffusion tube sites within the port boundary, which are run by the Port of Felixstowe. A map of all the monitoring sites is given in Appendix A.

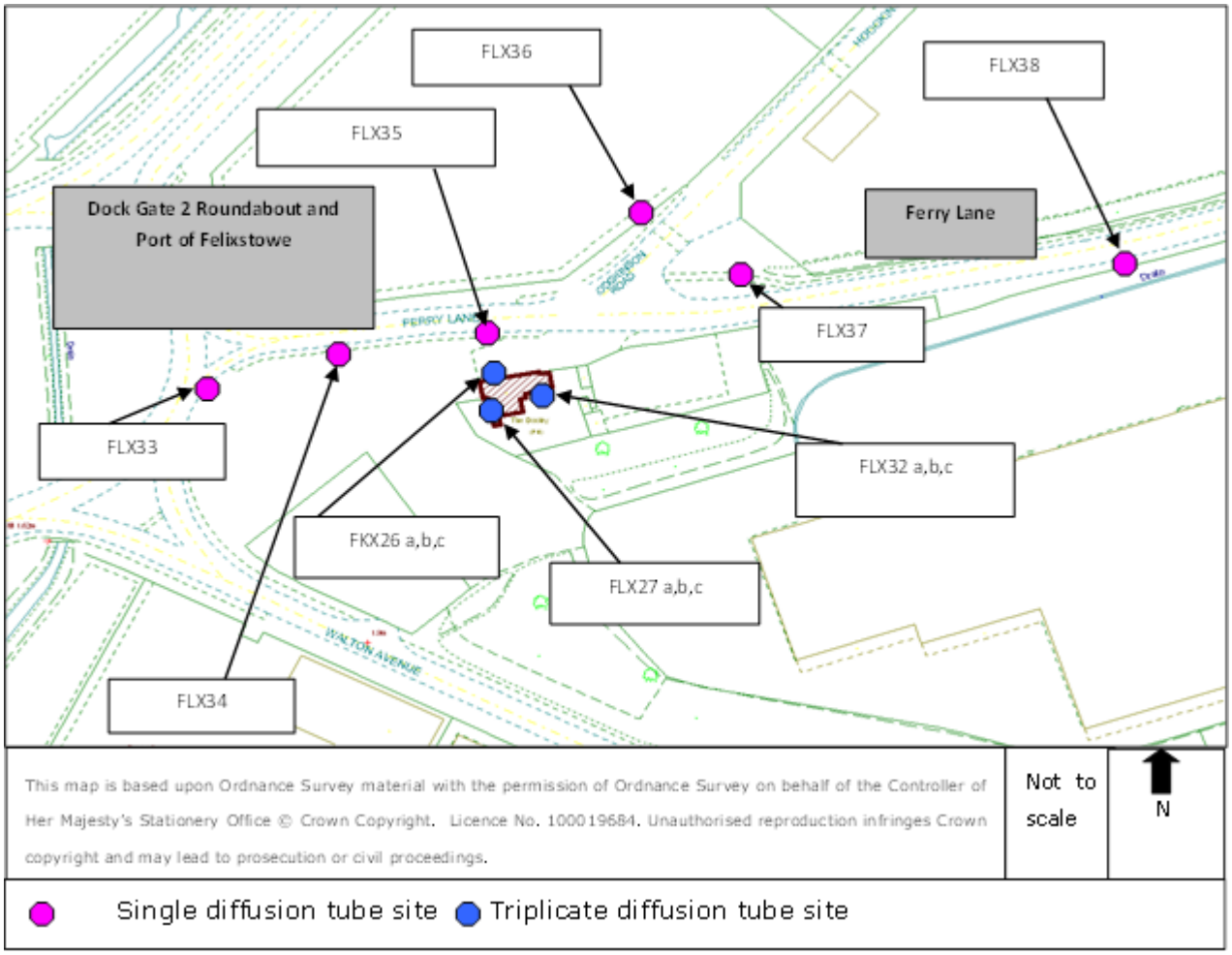


Figure 1: Diffusion tube locations in relation to Felixstowe AQMA at Dooley Inn, Ferry Lane

Table 1: Details of local authority diffusion tube monitoring sites in the Port of Felixstowe

Site ID	Site name	Site type	In AQMA?	X OS grid reference	Y OS grid reference	Distance to kerb of nearest road (m) - roundabout	Distance to relevant exposure (m)	Does the site represent Worst Case Exposure?
FLX21	4 Kingsfleet Road, Trimley St. Mary (Urban Background)	Urban background	No	629253	234431	N/A	N/A	n/a
FLX26 a,b,c	Front of The Dooley Inn at first floor window height	Industrial/ roadside	Yes	627959	234246	75	0	Y
FLX27 a,b,c	Side of The Dooley Inn facing the Port of Felixstowe	Industrial/ roadside	Yes	627960	234238	75	0	Y
FLX32 a,b,c	Guttering at rear of Dooley Inn facing the rear garden	Industrial	Yes	627971	234242	75	0	Y
FLX33	Dock Gate 2 Roundabout.	Roadside	No	627884	234238	5	N/A	Y
FLX34	Ferry Lane, Midway between roundabout and Dooley Inn.	Industrial/ roadside	No	627934	234257	25	N/A	Y
FLX35	Dooley Inn signpost at front.	Industrial/ roadside	No	627959	234258	77	N/A	Y
FLX36	Street Sign in Hodgkinson Road.	Industrial/ roadside	No	627989	234279	110	N/A	Y
FLX37	Lamp post at Ferry Lane on corner of Hodgkinson Rd	Industrial/ roadside	No	628012	234272	133	N/A	Y
FLX38	Lamp post on Ferry Lane, past Hodgkinson Rd.	Industrial/ roadside	No	628130	234280	220	N/A	Y

2.2 Monitoring data

Annual mean NO_2 concentrations from the diffusion tubes have been bias adjusted according to the relevant laboratory and preparation method. The local authority and Port of Felixstowe use different methods for the diffusion tubes, so a different bias adjustment factor has been applied (see Appendix B for further details).

Table 2 provides the annual mean concentrations measured at the nine local authority sites close to the AQMA for the period 2008-2014. Data from the urban background site in Felixstowe (FLX21) are also given as a comparison as this site is not affected by emissions associated with the port.

Table 2: Long term annual mean NO_2 concentrations at diffusion tube sites in the vicinity of the Felixstowe AQMA

Site ID	Within AQMA?	Annual mean concentration bias adjusted (μg/m³) *(Adjustment factor used for 2014 = 0.81)*						
		2008	2009	2010	2011	2012	2013	2014*
FLX21	No	27	25	24	25	22	22	19
FLX26 a,b,c	**Yes**	**42**	**45**	**43**	**40**	36	37	36
FLX27 a,b,c	**Yes**	36	38	33	36	33	32	32
FLX32 a,b,c	**Yes**	~	~	~	37	34	32	29
FLX33	No	~	~	~	**66**	**60**	**58**	**55**
FLX34	No	~	~	~	**51**	**46**	**42**	**45**
FLX35	No	~	~	~	**48**	**44**	**41**	**43**
FLX36	No	~	~	~	41	37	36	36
FLX37	No	~	~	~	**48**	**43**	**41**	**42**
FLX38	No	~	~	~	39	34	32	33

*All diffusion tubes had a 100% data capture rate in 2014 except for FLX33 which had a 92% data capture rate.

Data from the diffusion tube sites run by the Port of Felixstowe on the port itself are given in Table 3. A map of these sites is given in Appendix A.

Table 3: Long term annual mean NO_2 concentrations at diffusion tube sites on the Port of Felixstowe

Site ID	Within AQMA?	Annual mean concentration bias adjusted (μg/m³) *(Adjustment factor used for 2014 = 0.91)*							
		2007	2008	2009	2010	2011	2012	2013	2014
2 (Mallard House)	No	**50**	**47**	**46**	**47**	**45**	**42**	38	39.8
3 (Stores Car Park)	No	**49**	**48**	**43**	**45**	**42**	39	38	39.7
4 (Pier Hose LT7113)	No	~	35	31	36	32	34	32	28.3*
5 (Pier House LT7120)	No	~	34	30	35	29	34	32	26.4

Site ID	Within AQMA?	Annual mean concentration bias adjusted (µg/m^3) *(Adjustment factor used for 2014 = 0.91)*							
		2007	2008	2009	2010	2011	2012	2013	2014
6 (Landguard Eng LT7404)	No	~	36	29	31	28	29	26	27.1
7 (90 Park LT7403)	No	~	32	30	32	29	29	27	26.7
8 (90 Park LT7410	No	~	30	28	28	28	25	25	24.1
9 (75 Park (LT7402)	No	~	37	35	40	33	31	28	29.6*
10 (75 Park (LT7507)	No	35	30	30	31	27	28	30	23.2*

*Sites annualised as monitoring ceased in June 2014 (see Appendix C). All other tubes had a data capture rate of 92% or greater.

2.2.1.1 Concentrations in the AQMA

Since the Action Plan was finalised in 2012/13 the results of diffusion tube monitoring show that annual mean NO_2 concentrations within the AQMA have fallen below the relevant objective and the three diffusion tube sites within the AQMA have measured concentrations below the objective for the last three years (see Table 2). The concentration at FLX26, which is the worst-case location, situated on the front façade of the Dooley Inn facing Ferry Lane is the only site where the annual mean NO_2 objective has been exceeded in the past. Between 2008-2010, concentrations were above the objective and in 2011, concentrations were equal to the objective. FLX26 continues to record the highest concentrations in the AQMA, with levels holding at between 36-37µg/m^3.

2.2.1.2 Concentrations outside the AQMA

The local authority monitoring sites outside of the AQMA do not represent relevant exposure. However, site FLX33 records the highest annual mean NO_2 concentrations, (55 µg/m^3 in 2014). This site is located 5 metres from the kerbside of Dock Gate 2 roundabout at the port boundary. Concentrations are found to decline away from Dock Gate 2 roundabout along Ferry Lane, towards The Dooley Inn (FLX34 and 35) and past it, to FLX38. The main source of emissions at Dock Gate 2 is from HDVs entering and leaving the port. Emissions from these vehicles also play part in contributing to the concentrations seen within the AQMA. The Further Assessment report found that emissions from HDVs contributed to 29% of concentrations at the AQMA [5]. This gradient in measured concentrations is shown in Figure 2 (i.e. green being low, yellow marginal and red exceeding the air quality annual NO_2 mean objective)

There is no relevant exposure to the annual mean objective on the port itself, but the monitoring data shows that the highest concentrations are recorded at Mallard House and the stores car park which are closet to Dock Gate 2 (see map in Appendix A). The annual mean objective has not been exceeded on the port since 2012. Similarly to the measured concentrations in the AQMA, levels of NO_2 have fallen at all sites in Felixstowe. These trends are considered further in Section 3.

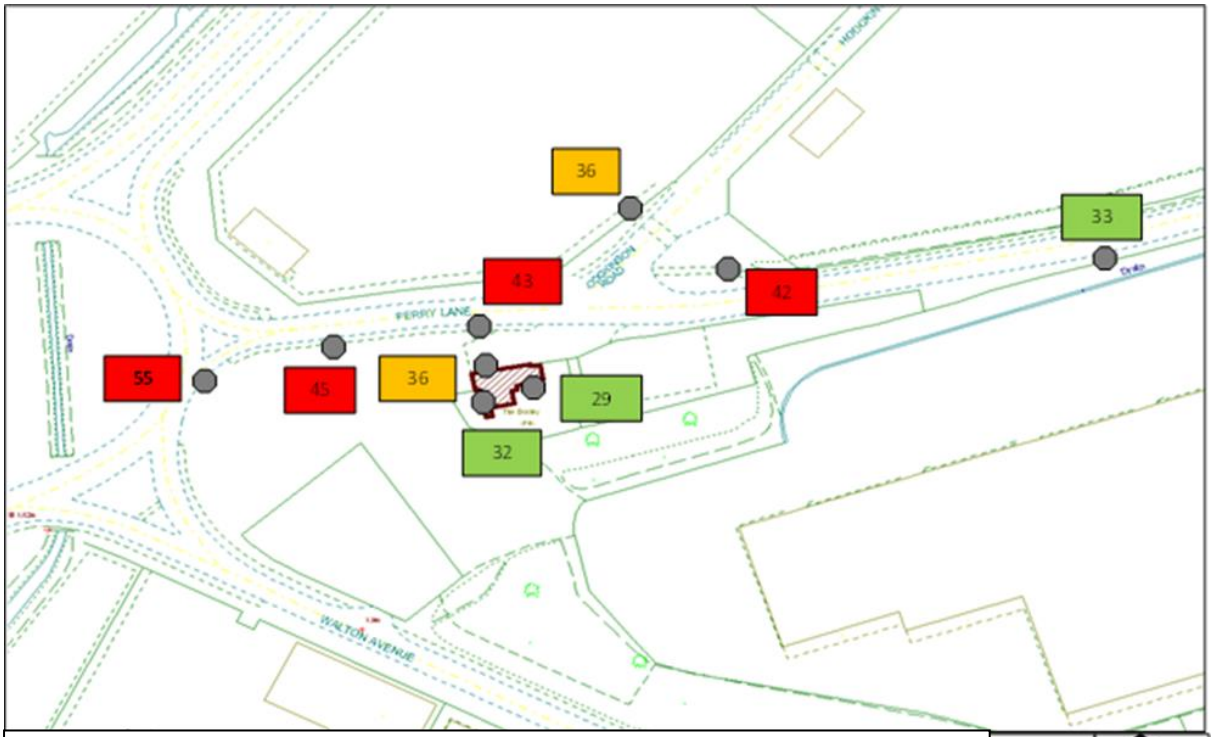


Figure 2: 2014 annual mean NO_2 concentrations in the vicinity of the Felixstowe AQMA

3 Trends

According to Defra's technical guidance [4], when considering whether to revoke an AQMA, local authorities should consider measurements for several years or more (i.e. three to five years). They should also investigate national trends and local influences that may be affecting the AQMA. For this reason, the three years' worth of data showing compliance with the objective at the Felixstowe AQMA is considered sufficient. However, the guidance also states that when conducting trend analysis, ideally more than five years' worth of data should be assessed to demonstrate whether trends are statistically significant. The reason for this is because changes in concentrations occur from year to year due to weather conditions. This section therefore considers trends in measured annual mean NO_2 concentrations for the longest time period possible. Data from monitoring sites within Felixstowe have been compared to trend data from local and national background sites.

3.1 Comparison of trends in NO_2 concentrations within the AQMA

The trends in annual mean concentrations measured within the AQMA have firstly been compared to the urban background site within Felixstowe. These data are given in Figure 3, for the period from 2008-2014.

The graph shows that although concentrations exhibit a small year on year variability and were generally highest in 2009, the overall trend is for concentrations to have declined since 2008. Concentrations in the AQMA have been below the annual mean objective since 2011, when the value was equal to the objective at FLX26. Since 2010, the annual mean concentrations measured within the AQMA have declined by a maximum of 16% (at FLX26), compared to a reduction in the background concentration of 21% over these five years.

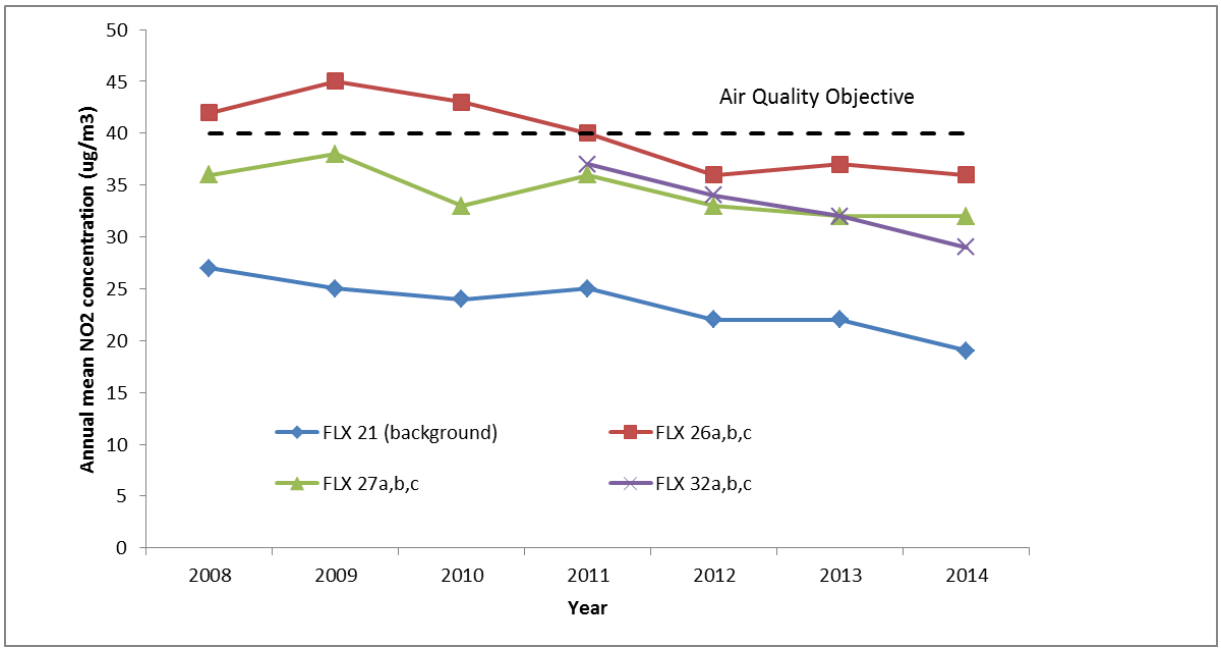


Figure 3: Trends in annual mean NO_2 concentrations in the Felixstowe AQMA compared to urban background

3.2 Comparison of trends in NO_2 concentrations outside the AQMA

Measured concentrations at diffusion tube sites outside of the AQMA in the Port of Felixstowe have also been compared to the local background site. These data are shown in Figure 4, for the period 2007-2014 where data are available. As for concentrations within the AQMA, there is a variation in the levels each year, with the highest recorded concentrations found in 2009 and 2010. The meteorological conditions in these years may have been less favourable for pollution than in other years. Although the majority of monitoring sites had a reduction in concentrations in the last year, there were small increases in 2014 compared to 2013 at a few sites (e.g. FLX34 and 35).

For those sites that had data available since 2010, the overall reduction in measured annual mean concentrations for the last five years varied between 12% to a maximum reduction of 26% on the port. Measured concentrations were also found to exhibit a tendency to decline across Suffolk Coastal's entire diffusion tube monitoring network (including Felixstowe sites), with an average reduction of 15% between 2010-2014, similarly to that seen within the Felixstowe AQMA and slightly lower than that found at the local urban background site (FLX21).

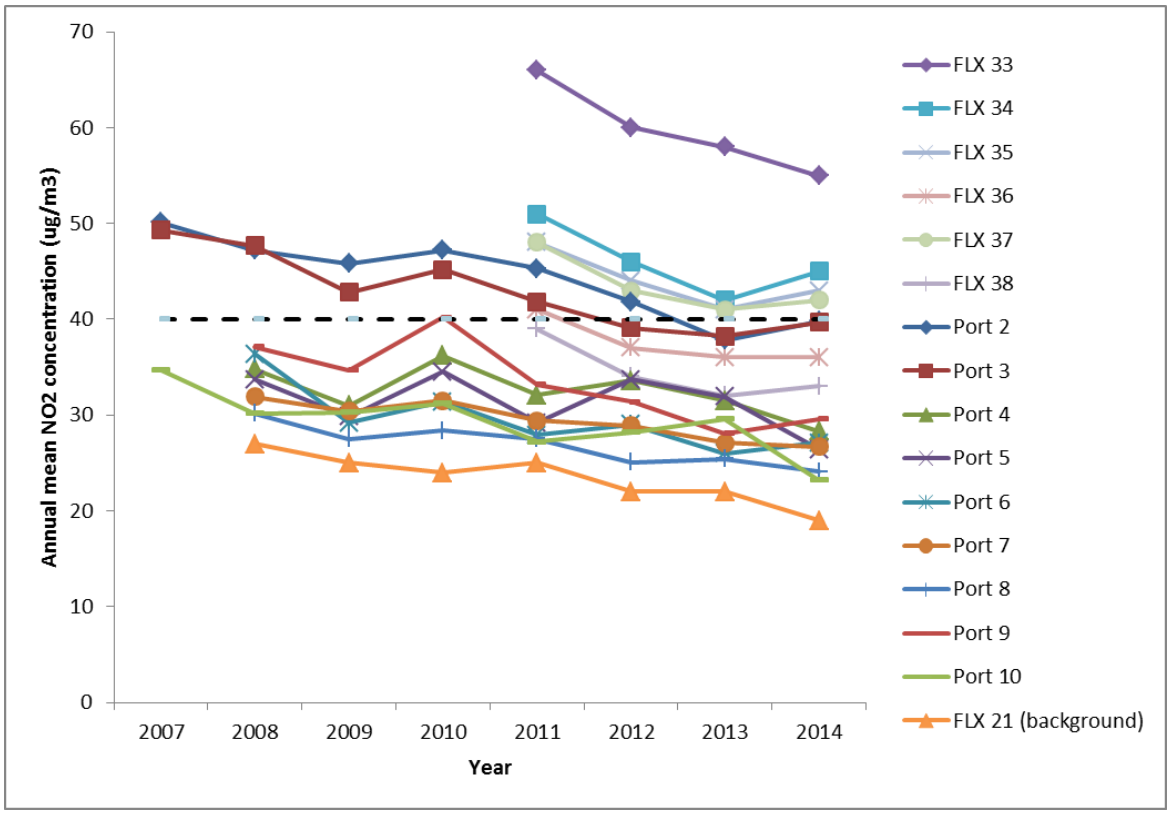


Figure 4: Trends in annual mean NO_2 concentrations outside the Felixstowe AQMA compared to urban background

3.3 Comparison of national trends in NO_2 concentrations

The trend in annual mean NO_2 concentrations in Felixstowe can also be compared to the trends in concentrations at the nearest national background sites run by Defra as part of their Automatic, Urban and Rural Network (AURN). This comparison is given in Figure 5, for the AQMA sites, two urban background sites (Thurrock and Southend) and two more rural background sites (St Osyth and Wicken Fen). The data from three of these national

background sites were relatively stable over these five years, except for at Wicken Fen where annual mean concentrations reduced by 32% to a value lower than 10 µg/m^3. The year on year variability was slightly different, with the national sites exhibiting a slight increase in 2012, which was not seen in Felixstowe.

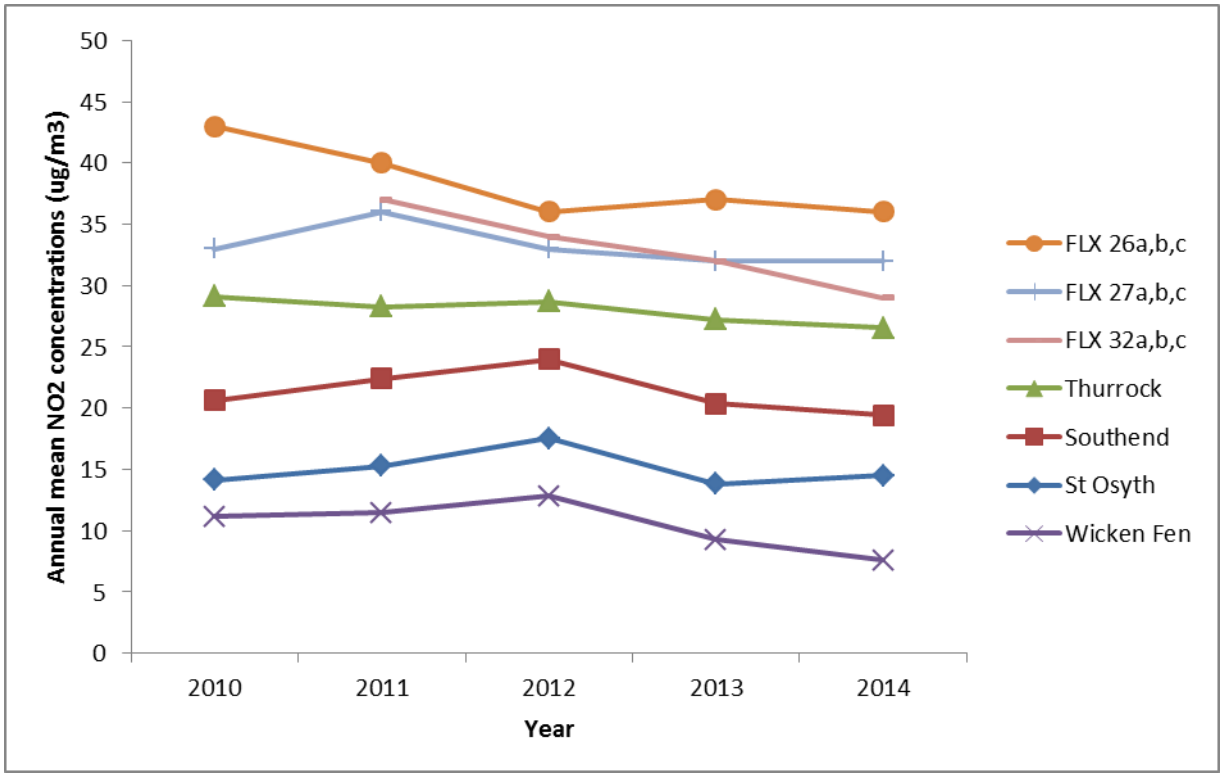


Figure 5: Trends in annual mean NO_2 concentrations outside the Felixstowe AQMA compared to urban background

3.4 Summary of trends

Defra's technical guidance [4] recommends that in situations where air quality monitoring data are being analysed, relatively long-term data series are required. They suggest that at least three years of data might be needed to indicate the effects of an intervention or to revoke an AQMA, whilst even longer-term information (five years or more) would be needed to show a statistically significant long term change. Long term datasets reduce the risk of random year-on-year variation due to changes in weather and other local circumstances.

Based on the most recent air quality monitoring data and trends over the last three to five years, it is clear that annual mean NO_2 concentrations are declining in the Port of Felixstowe, potentially at a higher rate than concentrations at nearby background sites. Measured concentrations are now below the objective in the AQMA and based on the trend analysis and the progress on measures to reduce emissions associated with the port (see Section 4), it is considered very unlikely that the objective will be exceeded in the AQMA in the future.

The local authority will continue to monitor NO_2 concentrations within the AQMA and along Ferry Lane. The number of monitoring sites within Ferry Lane may be reduced at some point in the future as these are not located at relevant receptors.

4 Action Plan Progress

4.1 Introduction

The local authority and Port of Felixstowe (PoF) have been proactive in working together to develop and implement the air quality action plan in an effort to try and reduce emissions from activities associated with the port. The final action plan was agreed in 2012, although work on some of the thirteen measures had already begun. To date, seven of these measures are now complete – three by Suffolk Coastal District Council and four by the Port of Felixstowe. All other measures which are the responsibility of the port of Felixstowe are on-going.

The Further Assessment suggested that emissions from the container handling operations at the Port (including vehicles on the road within the Port boundary) are the largest contributor to the concentrations measured at the AQMA, with emissions from heavy duty vehicles (HDVs) on roads outside the Port boundary being the second largest contributor. This is recognised by the Port Authority, and they have undertaken a vast and costly amount of work to successfully reduce emissions from the main sources from within their site, and from Dock Gate 2 roundabout. Despite the fact that productivity (throughput) has increased at the port, measured NO_2 concentrations have continued to decline.

4.2 Summary of progress

A full summary of progress made on all measures within the action plan is given in the 2015 USA Report [8], but a summary of some of the measures already implemented or ongoing that have helped to reduce emissions is given here.

Measure 2c – Identify Section 106 Planning gain opportunities and Measure 5c – Develop Supplementary Planning Document (SCDC)

All relevant planning applications for the district are assessed for their impacts on air quality, particularly with respect to declared AQMAs. SCDC ensure that any new, relevant, planning applications are received and commented on with regard to air quality. Further information regarding new developments in this area is given in Section 5 of this detailed assessment.

Measure 3a – Evaluate and implement efficient power technologies (PoF)

The Port has purchased 22 eco-Rubber Tyred Gantry Cranes (RTGs) which have smaller engines to allow them to run at maximum efficiency - leading to emission reductions. Sections of the Trinity Terminal were converted in 2014 to accommodate four fully electric RTGs (eRTGS) and a further 14 eRTGs are been installed in 2015. The Port has an ongoing commitment to increase the eRTGs over the next few years up to 50. This programme has the potential to reduce total diesel use at the port by up to 30%.

Measure 3d – Adopt NOx abatement technologies on Internal Movement Vehicles (IMVs) (PoF)

The Port has purchased 55 new IMVs in the last two years and all will be fitted with selective catalytic reduction (SCR) systems to decrease NOx concentrations in exhaust emissions. These vehicles comply with Euro III emission standards which is a significant improvement over the ones replaced, which met Euro I emission requirements.

Additional measures implemented (PoF)

- The Port of Felixstowe released a mobile phone app in 2014 to give customers up-to-date container status information. Users can track the status of a container through the port in real time and be notified when a container is ready for collection. This measure is helping to reduce unnecessary trips by HDVs around the port.
- In 2015 the first ever Ultra Large Container Ship designed to run on liquefied natural gas (LNG) made its maiden call at the Port of Felixstowe. These vessels are highly efficient which reduces significantly the amount of fuel they use, and therefore the emissions they create, per container.
- The Port is starting investigations to look at the possibility of using LNG to run ships whilst they are in berth rather than diesel.
- A 190m extension to Berth 9 will open in 2015 with 3 giant electric RTGs delivered mid-2015 for this extension. Due to the amount of containers that these larger ships can carry, and improved technology making emissions cleaner, the amount of emissions to air per container is much reduced.
- Felixstowe Logistics Park, the latest warehousing and logistics will be located within the Port's perimeter and accessed from internal roads close to Dock Gate 1. See Section 5 for more information on this development.
- Work is continuing in order to dual the Felixstowe Branch Line which should be open by 2019. This will increase the number of trains that can run each day from 30 to 48 thereby helping to increase the amount of freight moved by rail to and from the Port.
- Two new Rail Mounted Gantry cranes (RMGs) have been installed at the North Rail Terminal. These will help increase the volume of freight that can be moved by rail.
- The Port has recently opened Dock Gate 1 at night and they are encouraging hauliers to use this, particularly when accessing the Ro-Ro ferries. This measure will reduce the traffic around Dock Gate 2 which is closer to the AQMA.

5 New Developments which may have an effect on air quality

5.1 Planning polices

Suffolk Coastal District Council adopted their Core Strategy in 2013 and they are currently drawing up their new Local Plan to set out all planning policies and actions for future development up to 2027 and beyond. As these plans are being developed, the Council continues to have regard to the remaining 'saved' policies from the previously adopted Local Plan until these are replaced.

The Council has started the first stages of consultation on an Area Action Plan for the Felixstowe Peninsula to identify the scale and distribution of new development appropriate for the area. This action plan is planned for adoption by the end of 2016.

5.2 Developments on the port

Port of Felixstowe Logistics Park

The Port of Felixstowe submitted an application for a 1.45 million ft^2 logistics park (warehousing) within the Port perimeter in 2015. The logistic park aims to allow businesses to deal with their freight before moving it on either by ship, rail or road. Access from the berths to the warehousing will all be via internal roads and the logistics park's main external access will be via Dock Gate 1.

An air quality assessment for the logistics park was submitted in May 2015. This modelling assessment concluded that the magnitude of change at all receptors, included those within the AQMA was considered to be imperceptible with the development in place in 2016. For example, at receptors within the AQMA, the increase in annual mean NO_2 concentrations due to the development was predicted to be 0.03 $\mu g/m^3$. The annual mean objective was shown to have been met in 2016 within the AQMA [9].

There were likely to be some site specific mitigation measures required to reduce any residual impacts associated with construction. This could be done by adopting suitable construction dust mitigation measures and ensuring that HDVs use Dock Gate 1 rather than Dock Gate 2 through a planning condition.

5.3 Development proposed or planned in the near vicinity

High bay distribution centre at Clickett Hill, Trimley St Mary

This planning application has planning consent although work has yet to be started. The distribution centre will be located on the A14 Port of Felixstowe Road and take bulk containerised goods from the Port of Felixstowe and reprocess them for onward distribution. Onward distribution will be via container back to the Port or onto an HDV for onward road distribution. The centre will have 369 car parking spaces and 168 spaces for HDV parking and will operate 24 hours a day.

An air quality assessment was submitted which modelled air quality at receptor locations on the road network including in the AQMA. The distribution centre was found to add to the HDV traffic using Dock Gate 2 roundabout near to the AQMA. The assessment predicted increases in concentrations of 0.2 µg/m^3 for NO_2 and 0.02µg/m^3 PM_{10} at the site of the AQMA with the development in place. Given the current annual mean concentration at the AQMA, these increases were considered not to result in a significant air quality impact.

These small cumulative increases in NO_2 concentration resulting from both developments when they are in place is unlikely to result in future exceedences of the annual mean objective within the AQMA.

Mixed use development, Candlet Road in Felixstowe

The only other relevant application is an Outline Planning Permission for up to 560 dwellings, including a Local Community Centre, a 60 Bedroom extra Care Home and 50 assisted Living Units, 2 small Business Units and open space provision with associated Infrastructure. This is based at Candlet Road in Felixstowe which is approximately 3 km from the AQMA. This application has been refused but is being appealed. However, it is unlikely to have an impact on the AQMA even if approved.

6 Conclusion

This detailed assessment has assessed the following evidence to demonstrate with confidence that the air quality objective for annual mean NO_2 is met within the Felixstowe AQMA and that there are unlikely to be any exceedences in the future:

- Recent annual mean NO_2 monitoring data in the AQMA and vicinity
- Long term annual mean NO_2 trends from local and national sites
- Existing and future measure to reduce emissions
- New or planned developments or sources that may increase emissions

There is strong evidence from local and nearby national monitoring sites for a downward trend in NO_2 concentrations over the last three to five years and there have been no measured exceedences of the objective in the AQMA since 2011, when the concentration at the worst case receptor (FLX26) was equal to the objective at 40 $\mu g/m^3$. Based on this evidence, it is expected that this downward trend in concentration will be maintained. The local authority will continue to monitor NO_2 concentrations within the AQMA and along Ferry Lane. The number of monitoring sites within Ferry Lane may be reduced at some point in the future as these are not located at relevant receptors.

Since the publication of the air quality action plan, the local authority and Port of Felixstowe have been proactive in working together to implement measures to reduce emissions from activities on the port from emissions from HDVs accessing the port – the two major source contributions to emissions. These measures include:

- Use of more smaller, more efficient and electric Rubber Tyred Gantry Cranes to replace the existing larger diesel cranes
- Purchase of newer internal movement vehicles fitted with selective catalytic reduction (SCR) systems to meet newer emission standards
- Reduction of emissions from HDV traffic using the port via Dock Gate 2 through better management of arrivals, increased use of rail for freight movements and increased used of Dock Gate 1 which is further away from relevant receptors.
- Improvements to shipping including increasing the sizes of berth to allow larger more efficient ships to use the port and investigating the potential for ships to run on liquefied natural gas in berth rather than diesel.
- Encouraging hauliers to use Dock Gate 1 instead of Gate 2 to reduce traffic close to the AQMA.

Despite an increase in throughput in the port, the implementation of these measures have assisted to reduce NO_2 concentrations. Furthermore, a similar decline in measured levels are occurring further away from the port.

There are currently two major developments proposed for the area which have the potential to add to the number of HDVs. However, with mitigation measures in place, it is expected that these developments will not lead to a significant increase in annual mean NO_2 concentrations. Modelled data from the logistics park development shows that concentrations at the diffusion tube sites within the AQMA and receptors (at first floor height) are predicted to be below the annual mean objective in 2016 with the development in place [9].

As a result of this evidence, it is recommended that the Felixstowe AQMA at Dooley Inn, Ferry Lane should be revoked. Suffolk Coastal District Council agree with this recommendation and will proceed to consult with Defra and other statutory bodies regarding this decision.

References

1. *Environment Act 1995*, Chapter 25. HMSO, 1997.

2. *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1 and 2)*. Report by the Department of Environment, Food and Rural Affairs in partnership with the Scottish Executive, Welsh assembly Government and Department of the Environment Northern Ireland. DEFRA Publications, July 2007.

3. *Part IV of the Environment Act 1995, Local Air Quality Management, Policy Guidance. LAQM.PG(09).* Report by the Department of Environment, Food and Rural Affairs in partnership with the Scottish Executive, Welsh assembly Government and Department of the Environment Northern Ireland. DEFRA Publications, February 2009.

4. *Part IV of the Environment Act 1995, Local Air Quality Management, Technical Guidance. LAQM.TG(09).* Report by the Department of Environment, Food and Rural Affairs in partnership with the Scottish Executive, Welsh assembly Government and Department of the Environment Northern Ireland. DEFRA Publications, February 2009.

5. *Further Assessment for the Air Quality Management Areas at Ferry Lane, Felixstowe*. Prepared by Transport Research Laboratory under contract to Suffolk Coastal District Council, April 2010

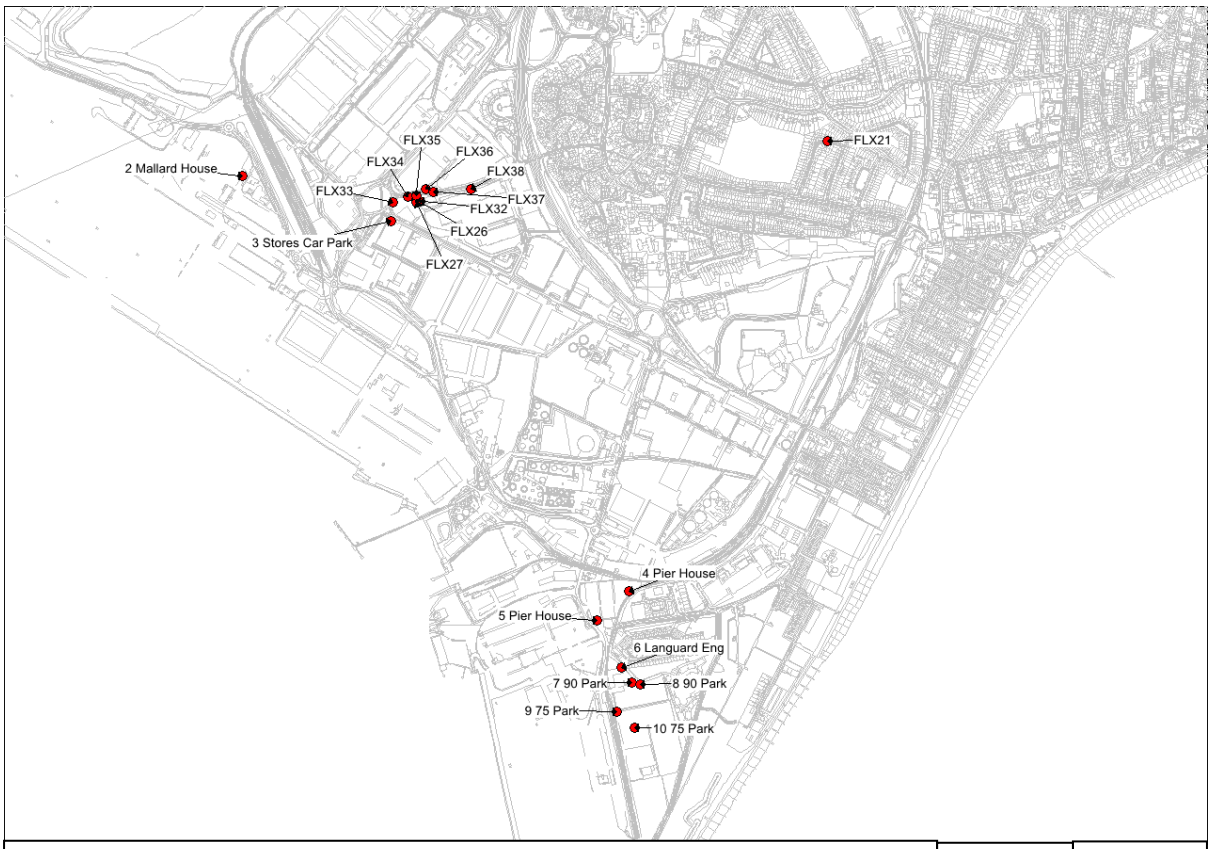
6. *Local Air Quality Management Action Plan for the Air Quality Management Area at Ferry Lane Felixstowe*. Prepared by Transport Research Laboratory under contract to Suffolk Coastal District Council, September 2012.

7. *2014 Air Quality Progress Report for Suffolk Coastal District Council. Produced by Suffolk Coastal District Council*, December 2014.

8. *2015 Air Quality Updating and Screening Assessment for Suffolk Coastal District Counc*il. Produced by Suffolk Coastal District Council, July 2015.

9. *Port of Felixstowe Logistics Park. Air Quality Assessment*. Royal Haskoning DHV, May 2015.

Appendix A Map of Diffusion Tubes around the Port



1 cm = 0.1 km

N

Appendix B NO_2 Diffusion Tube Bias Adjustment Factor

The analytical laboratory used for supply and analysis of the local authority NO_2 diffusion tubes is Environmental Scientifics Group (ESG) based in Didcot. The tubes are prepared by spiking acetone:triethanloamine (TEA) (50:50) onto the grids prior to the tubes being assembled. The tubes are then desorbed with distilled water and the extract analysed using a segmented flow auto-analyser with ultraviolet detection. The laboratory is formally accredited under the United Kingdom Accreditation Scheme (UKAS). The Port of Felixstowe using a different laboratory (Gradko) which uses 20% TEA in water.

Combined "national" bias adjustment factors for UK diffusion tube laboratories, based upon Local Authority co-location studies throughout the UK, are provided on behalf of Defra and the Devolved Administrations. The national bias adjustment factor given for ESG, Didcot in 2014, in the March 2015 edition of 'National Spreadsheet of Bias Adjustment Factors' was 0.81, using results from 22 different studies.[1] For Gradko, this adjustment factor is 0.91 based on 21 different studies.

These factors were applied to annual mean concentrations to the relevant diffusion tubes in this report.

[1] http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Appendix C Short term adjustment

Three diffusion tube sites operated by the Port of Felixstowe ceased in June 2014 (LT7 507, LT7 402 and LT7 113). Therefore their data capture rate for 2014 was 50%, which meant that the data needed to be adjusted (annualised) to represent an annual mean for the year. To do this, the methodology given in the Technical Guidance was followed and an average adjustment factor of 1.01 was calculated based on data from nearby background monitoring sites on Defra's automatic, rural and urban monitoring network – AURN (see table below). The data capture rates from the three chosen sites were above 90%. Wicken Fen was not used as the site had a data capture rate of 73% in 2014.

This adjustment factor was applied to the raw diffusion tube concentrations and this was then bias adjusted.

AURN monitoring site	Annual mean (Jan-Dec 2014)	Period mean (Jan-June 2014)	Adjustment factor (annual mean/period mean)
St Osyth	14.51	14.47	1.00
Southend	19.43	19.2	1.01
Thurrock	26.26	25.95	1.02
Average			**1.01**