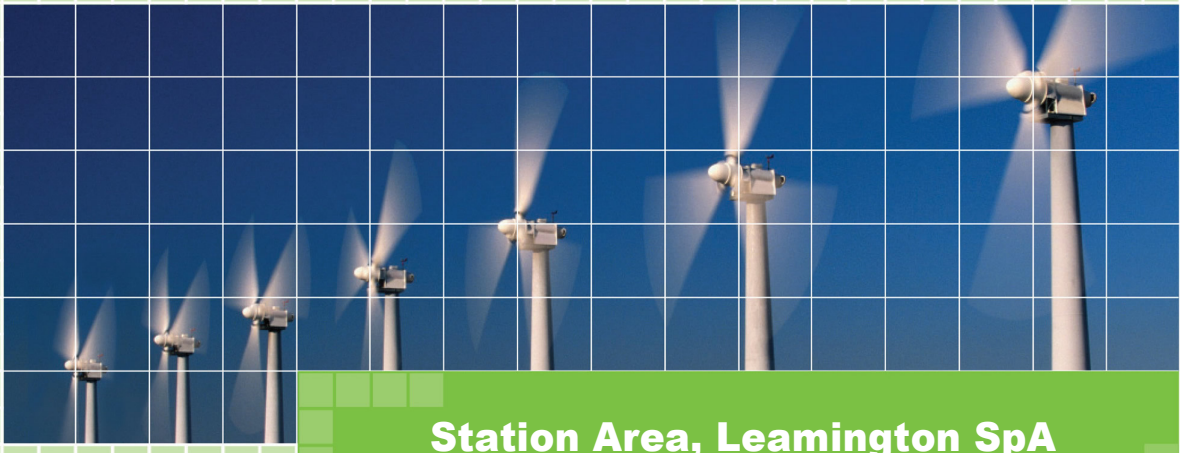

Station Area, Leamington SpA

Air Quality Constraints

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Prepared by	Alison Banks			
Signature				
Checked by	Joanne Gough			
Signature				
Authorised by	Alison Banks			
Signature				
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WSP Environmental UK
One Queens Drive
Birmingham
West Midlands
B5 4PJ

Tel: +44 (0)121 352 4700
Fax: +44 (0)121 352 4701
http://www.wspgroup.com

1 Introduction

1.1.1 This technical note identifies the constraints to development of the Station Area with regard to air quality. In particular it considers the existing air quality in the vicinity of the site, identifies sensitive receptors in the vicinity of the site and identifies the likely impact of the proposals.

2 Relevant Legislation

2.1.1 The Government's policy on air quality within the UK is set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS) published in July 2007[1]. The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK. The AQS is designed to be an evolving process that is monitored and regularly reviewed.

2.1.2 The AQS sets standards and objectives for nine main air pollutants to protect health, vegetation and ecosystems. These are benzene (C_6H_6), 1,3 butadiene (C_4H_6), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), sulphur dioxide (SO_2), ozone (O_3), and polycyclic aromatic hydrocarbons (PAHs).

2.1.3 The air quality standards are concentration limits which represent negligible or zero risk to health, based on medical and scientific evidence reviewed by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO). Above these limits sensitive members of the public (e.g. children, the elderly and the unwell) might experience adverse health effects.

2.1.4 The air quality objectives are medium-term policy based targets set by the Government which take into account economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to the EPAQS recommended standards or WHO guideline limits, whereas others involve a margin of tolerance, i.e. a limited number of permitted exceedences of the standard over a given period.

2.1.5 For some pollutants, (e.g. NO_2), there is both a long-term (annual mean) standard and a short-term standard. In the case of NO_2, the short-term standard is for a 1-hour averaging period, whereas for PM_{10} it is for a 24-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants, for example temporary exposure on the pavement adjacent to a busy road, compared with the exposure of residential properties adjacent to a road.

2.1.6 The AQS published in 2007 replaces the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (January 2000) and Addendum (February 2003). The majority of objectives set out in the previous version of the AQS have been retained; however, the provisional objectives previously proposed for PM_{10} have been replaced in England, Wales and Northern Ireland with a new framework for considering the effects of a finer group of particles known as '$PM_{2.5}$'. The introduction of this framework is based on increasing evidence that this size of particles can be more closely associated with observed adverse health affects than PM_{10}. For $PM_{2.5}$ the objectives will take the form of a limit value ('backstop objective') and an 'exposure reduction' target. Although a target for $PM_{2.5}$ is included in the AQS, there is currently no requirement for local authorities to assess this pollutant as part of their statutory obligations, and there is insufficient information available regarding local background levels to enable accurate assessment at this time.

2.1.7 Of the pollutants included in the AQS, NO_2 and PM_{10} will be particularly relevant to the proposals as road traffic is a major source and concentrations of these pollutants tend to be close to air quality objectives in urban locations such as the proposed development site. Local authorities undertaking review and assessments of air quality are finding that, where road traffic is the dominant source of air pollution, the objectives for these pollutants are likely to be the most difficult to achieve. It is also generally considered that, where concentrations of NO_2 and PM_{10} meet their respective objectives, and there are no other local sources of air pollution, such as from industrial processes, objectives for the other pollutants included in the regulations will also be achieved.

[1] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2) – July 2007.

3 Existing Air Quality

3.1 LOCAL EMISSION SOURCES

3.1.1 The Station Area is located in an area where air quality is mainly influenced by emissions from transport. A number of roads, the A425 and A452, pass close to the site. Two rail lines run through the site, both of which are used by diesel trains. Emissions arising from these will have some influence on the air quality within and in the vicinity of the site.

3.1.2 Review of Warwick District Council's (WDC) Updating and Screening Assessment of Air Quality 2006 and consultation with the Environmental Health Officer (EHO) of WDC identified that there are no Part A2/B[2] industrial pollution sources in the immediate vicinity of the site that are likely to significantly affect local air quality.

3.1.3 The Environment Agency's website (http://www.environment-agency.gov.uk) indicates there are no Part A1[3] processes within the vicinity of the site that are likely to affect local air quality. The closest Part A1 process is located approximately 3.5km to the northeast of the site which is a surface treating metal and plastic company operated by Surface Technology plc. There have been no notifiable releases to air i.e. above limits prescribed in their authorisation, from this process in 2006 which is the only for which records were available.

3.2 LOCAL AIR QUALITY MANAGEMENT

3.2.1 Under Part IV of the *Environment Act 1995*, local authorities must review and document local air quality within their area by way of staged appraisals and respond accordingly, with the aim of meeting the Air Quality Strategy (AQS) objectives by the years defined in the Regulations. Where the objectives of the Air Quality Regulations are not likely to be achieved by the objective year, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it intends to work towards achieving air quality standards in the future.

3.2.2 Warwick District Council (WDC) has completed the first and second round of the review and assessment process. As a result WDC have declared an AQMA centred along High Street, Bath Street and Clements Street immediately to the east of the Station Area.

3.3 LOCAL AIR QUALITY MONITORING

3.3.1 In the UK, the Department for Environment, Food and Rural Affairs (DEFRA) coordinates a network of automatic monitoring stations which are continually collecting information on air quality in urban and rural locations across the country. This 'Automatic Urban and Rural Network' (AURN) provides hourly information on a variety of pollutants, which is available for download from the UK Air Quality Archive on the internet (http://www.airquality.co.uk).

3.3.2 An AURN site classified as an Urban Background site is located approximately 450m to the northeast of the area. Recent monitoring results for this station are summarised in **Table 1** below.

TABLE 1 Pollutant concentrations monitored at the AURN site (µg/m^3)

Site	O.S. Grid Reference	Distance to Site	Pollutant	Annual Mean Concentration (µg/m^3)		
				2005	2006	2007
Leamington Spa AURN – Urban Background	531932, 265743	450m northeast	Annual Mean NO_2	25.1	20.1	24.8
			Annual Mean PM_{10}	20.7	23.9	21.2

3.3.3 WDC has undertaken diffusion tube monitoring at a number of locations to the east of the Station Area, most of which are located within the AQMA. Results from these sites during 2007 are given in **Table 2** below.

[2] Small scale industrial processes requiring authorisation from the Local Authority

[3] Large scale industrial processes requiring authorisation from the Environment Agency.

TABLE 2 Pollutant concentrations monitored at the Diffusion Tubs Sites (µg/m^3)

Site	O.S. Grid Reference	Distance to Site	Annual Mean NO_2 Concentration
High Street	432054, 265218	200m east	49.1
Spencer Street	431860, 265365	50m northeast	45.4
Farley Street	432560,265254	700m east	40.2
Clements Street	432051, 265060	250m southeast	33.4
George Street	432163, 265294	325m east	33.3
Wise Street	431900, 265189	50m southeast	57.0
Tachbrook Road	431862, 265169	50m south	45.0
Old Warwick Road	431849, 265193	20m south	46.6

3.3.4 The majority of the monitoring locations are classified as roadside or kerbside locations. The results of the monitoring indicate that the annual mean NO_2 concentrations measured at the majority of locations are in excess of the relevant AQS objective level of 40µg/m^3 to be achieved by 2005.

3.4 BACKGROUND AIR QUALITY

3.4.1 Background concentrations can also be estimated from the UKAQA where estimated background concentrations of these pollutants have been mapped at a grid resolution of 1x1km grid squares for the whole of the UK. Background concentrations obtained for oxides of nitrogen (NO_x), NO_2 and PM_{10} at the site are 37.8µg/m^3, 23.3µg/m^3 and 23.4µg/m^3 in 2008 respectively. These are an average of the concentrations obtained for grid squares centred on grid references 430500, 265500 and 431500, 265500.

3.4.2 The measured background concentrations at the AURN site show very good agreement with modelled background concentrations taken from UKAQA and are below the relevant Air Quality Strategy Objective Levels of 40µg/m^3 for annual mean NO_2 and PM_{10} concentrations to be achieved by 2005 and 2004 respectively.

3.5 SENSITIVE LOCATIONS

3.5.1 DEFRA has published technical guidance for use by local authorities in their review and assessment work. This guidance, '*Local Air Quality Management Review and Assessment Technical Guidance LAQM.TG(03)* (Feb 2003)' describes in detail typical locations where consideration should be given to pollutants defined in the AQS.

3.5.2 Sensitive locations are those where the public may be exposed to pollutants from the site. These will include locations sensitive to an increase in dust deposition as a result of on-site construction activities, or exposure to gaseous pollutants from exhaust emissions from construction site traffic and traffic associated with the proposed development, once operational.

3.5.3 Locations with a high sensitivity to dust generated by construction activities include hospitals and clinics, hi-tech industries, painting and furnishing and food processing. Locations classed as being moderately sensitive to dust include schools, residential areas and food retailers.

3.5.4 In terms of locations that are sensitive to gaseous pollutants emitted from engine exhausts, these will include all locations where members of the public will be exposed to pollution over the time that they are present, and therefore the most suitable AQS averaging period of the pollutant needs to be used for assessment purposes.

3.5.5 For instance, on a footpath, where exposure will be transient (for the duration of passage along that path) comparison with short-term standard (i.e. 15 minute mean or 1 hour mean) may be relevant. In a school, or adjacent to a private dwelling, however, where exposure may be for longer periods, comparison with a long-term (such as 24 hour mean or annual mean) standard may be most appropriate. In general terms, long-term standards are lower than short-term standards owing to the chronic health effects associated with exposure to low level pollution for longer periods of time.

3.5.6 The land use surrounding the Station Area is predominantly residential and as such considered to be sensitive to changes in air quality arising from the construction and operational phases of any development of the site.

4 Potential Constraints To Development Due To Air Quality

4.1 CONSTRAINTS ARISING FROM THE EXISTING AIR QUALITY

4.1.1 The Station Area is bordered to the south and east by busy A roads (A425 and A452) and it is also transected by two rail lines, both of which are used by diesel trains. The presence of these sources within and around the development is likely to lead to a degradation of air quality within the site. The development proposals include an element of residential use which is considered to be sensitive to poor air quality.

4.2 CONSTRAINTS ARISING FROM THE PROPOSED DEVELOPMENT

4.2.1 The site is surrounded by residential properties.

4.2.2 The air quality along key roads (High Street, Bath Street and Clements Street) immediately to the east of the subject site is currently poor which has led to WDC declaring an AQMA in relation to exceedances of the annual mean NO_2 objective level.

4.2.3 Any significant increase in traffic on these roads, which is likely to occur as a result of the proposals, may lead to worsening of the air quality within the AQMA. Consideration should therefore be given to the routes taken by vehicles generated by the proposals and wherever possible traffic generation as a result of the proposals should be minimised.

5 Recommended Further Assessment

5.1.1 Detailed air dispersion modelling should be undertaken to determine the impact of the increase in traffic as a result of the proposals on the air quality at sensitive locations in the vicinity of the site, in particular within the AQMA and the likely pollutant concentrations within the site for comparison with the relevant AQS objectives.

5.1.2 Dispersion modelling to predict air quality at locations adjacent to the rail lines that transect sites and the surrounding main roads would also be useful to inform the detailed design.