

## **Appendix 3**



AIR QUALITY MANAGEMENT  
PLAN:

*WHITTLESEY BRICKWORKS*

December 2004

Report Reference C12-P01-R04



**Independent Air  
Quality & Odour  
Specialists**

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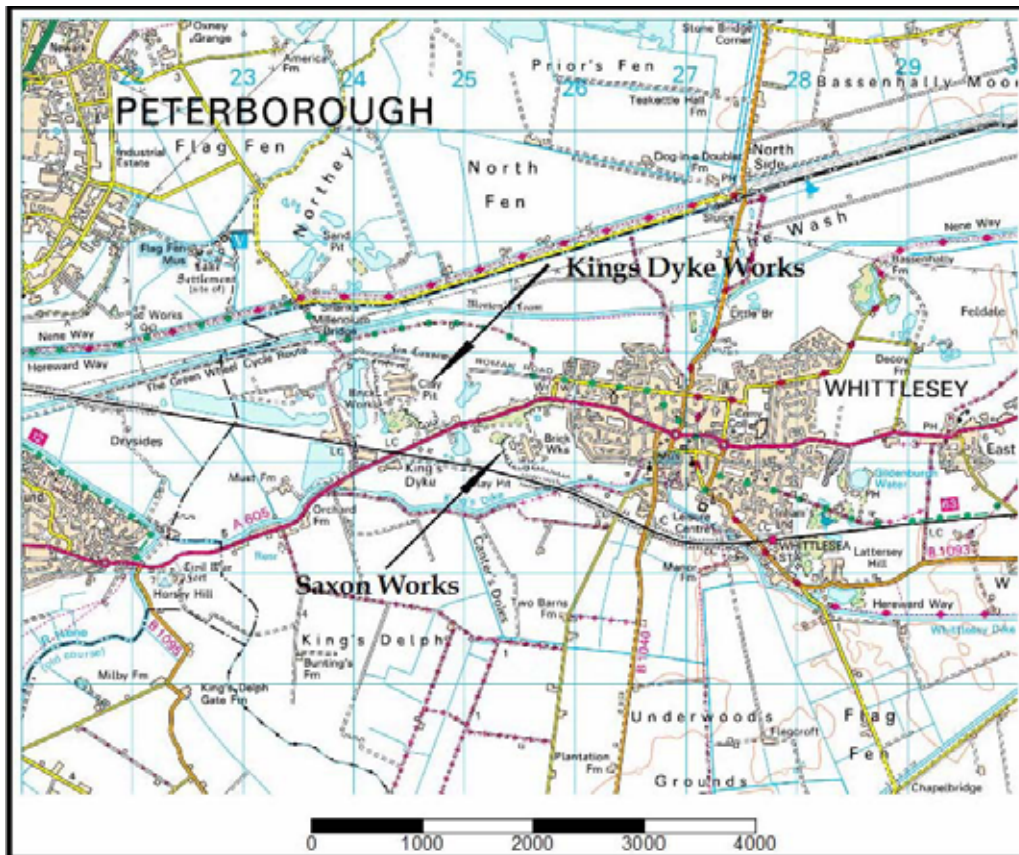
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# 1 INTRODUCTION

## 1.1 THE AIR QUALITY MANAGEMENT PLAN

Gair Consulting Ltd has been commissioned by Hanson Building Products Ltd to prepare an Air Quality Management Plan (AQMP) for the Whittlesey Brickworks. The Whittlesey Brickworks comprises the Saxon kilns located 1.5 km to the west of the centre of Whittlesey and the Kings Dyke kilns located approximately 2.5 km to the west of the centre of Whittlesey. The location of the Works is presented in *Figure 1.1*.

**FIGURE 1.1 LOCATION OF THE WHITTLESEY BRICKWORKS**



There are four UK objectives for  $SO_2$  based on an annual mean, a 24-hour mean, a 1-hour mean and a 15-minute mean. Except for the 15-minute objective, these will all become mandatory European Union (EU) objectives at the beginning of 2005. Therefore, the principal aim of the AQMP is to provide a strategy for compliance with these objectives by the deadline of 1 January 2005. Where compliance with the UK 15-minute objective cannot be achieved at residential locations the aim of AQMP will be to reduce ground level concentrations to such a level that is feasible with consideration of what is considered to be Best Available Techniques (BAT) for the Works.

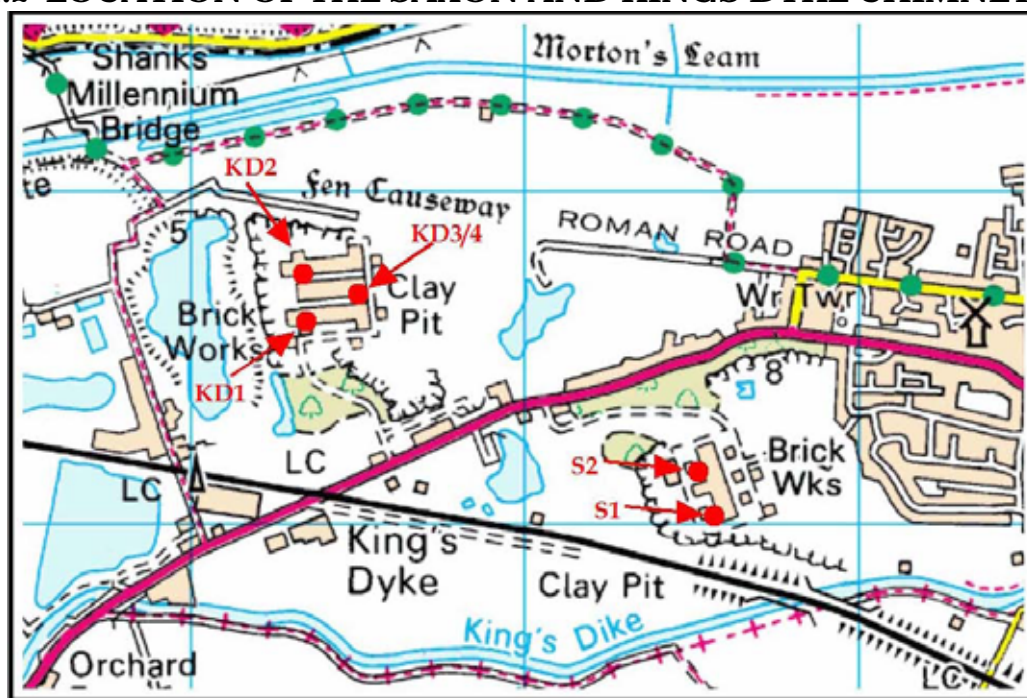
In developing the AQMP the following have been considered:

- An assessment of the existing activities of the Works on local air quality.
- Options for the control, reduction of emissions as well as improved dispersion to reduce off-site ground level concentrations.
- An assessment of the influence of control options on SO<sub>2</sub> concentrations.
- Monitoring (ambient air quality and meteorological data) requirements for the assessment of future air quality impacts.
- Recommendations for future studies to provide further quantification of the impact on SO<sub>2</sub> concentrations following receipt of updated monitoring and meteorological data for the location.

## 1.2 OVERVIEW OF ACTIVITIES AT THE WORKS

There are currently two kilns at the Saxon Works (S1 and S2) and four kilns at the Kings Dyke Works (KD1, KD2, KD3 and KD4). Except for KD3 and KD4, each kiln exhausts via its own chimney. KD3 and KD4 share a chimney (chimney KD3/4). The location of the chimneys is illustrated in *Figure 1.2*. All kilns comprise 34 chambers and are operated with two fires.

**FIGURE 1.2 LOCATION OF THE SAXON AND KINGS DYKE CHIMNEYS**



The weekly brick production capacity at the Whittlesey Brickworks is as follows:

- Kiln S1 – 1.25 million bricks per week;
- Kiln S2 – 1.25 million bricks per week;
- Kiln KD1 – 1.25 million bricks per week;
- Kiln KD2 – 1.25 million bricks per week;
- Kiln KD3 – 1.25 million bricks per week; and
- Kiln KD4 – 1.25 million bricks per week.

### **1.3 STRUCTURE OF THE REPORT**

The remainder of this report is structured as follows:

- *Section 2* provides a discussion of the air quality standards and objectives that are applicable for SO<sub>2</sub> and presents local air quality monitoring data for SO<sub>2</sub>.
- *Section 3* presents a dispersion modelling assessment of the impact of existing activities at the Works on SO<sub>2</sub> concentrations.
- *Section 4* provides a description of potential options available for the control of SO<sub>2</sub> emissions and other improvements to reduce the impact of the Works on ground level SO<sub>2</sub> concentrations.
- *Section 5* presents the air quality strategy for the Works and recommendations for obtaining additional information on the impact of the Works on local air quality.

## 2 LOCAL AIR QUALITY

### 2.1 AIR QUALITY STANDARDS AND OBJECTIVES FOR SO<sub>2</sub>

There are three types of air quality standards for SO<sub>2</sub> applicable in the UK including:

- Air Quality Strategy objectives and European Union Daughter Directive air quality standards;
- Air Quality Strategy objectives that are contained within the UK Air Quality regulations but not European legislation;
- Air Quality Strategy objectives that are not contained in either the UK regulations or European legislation and are set for the protection of vegetation<sup>1</sup>.

The target date for the majority of the objectives is the end of 2004 or 2005. Air quality limits and objectives for SO<sub>2</sub> in the UK are summarised in *Table 2.1*.

**TABLE 2.1 UK AIR QUALITY OBJECTIVES FOR SULPHUR DIOXIDE**

Objective	Air Quality Standard (µg m <sup>-3</sup> )	Date to be Achieved
<i>Air Quality Strategy/Daughter Directive</i>		
1-hour mean not to be exceeded more than 24 times per year (a)	350	31 December 2004
24-hour mean not to be exceeded more than 3 times per year (b)	125	31 December 2004
<i>Air Quality Strategy</i>		
15-minute mean not to be exceeded more than 35 times per year (c)	266	31 December 2005
<i>Air Quality Strategy (not in the AQ Regulations) – Vegetation Based</i>		
Annual mean	20	31 December 2000
Winter mean (October to March)	20	31 December 2000
(a) This corresponds to the 99.7 <sup>th</sup> percentile of hourly means (b) This corresponds to the 99.2 <sup>nd</sup> percentile of daily means (c) This corresponds to the 99.9 <sup>th</sup> percentile of 15-minute means		

The 15-minute mean concentration is considered to be the most stringent and is unusual for several reasons. Firstly, it is not a European objective and compliance with this limit does not need to be demonstrated to the European Union. Secondly, the 15-minute and 1-hour limit values are inconsistent, as a limit value for a shorter exposure period would normally be a higher concentration compared to a longer exposure time period. The 15 minute concentration is lower than the one hour concentration such that there may be compliance with the UK/European one hour limit, but exceedance of the UK 15 minute limit.

The annual mean objective for the protection of vegetation only applies to non-urban locations. The Daughter Directive specifies that monitoring to assess compliance with this limit value for the protection of vegetation should be undertaken in rural areas defined as 20 km from agglomerations (i.e. >250,000 inhabitants) or more than 5 km from other built up areas, industrial installations or motorways<sup>2</sup>.

## **2.2 AMBIENT AIR QUALITY MONITORING**

There are no air quality monitoring stations in the immediate vicinity of the Whittlesey Works to characterise air quality. Information on background concentrations of pollutants (i.e. not influenced by the works) can be obtained from the UK air quality archive ([www.airquality.co.uk](http://www.airquality.co.uk)). Annual mean background concentrations of SO<sub>2</sub> are estimated from the archive to be 2 µg m<sup>-3</sup>.