

Air and Dust Construction Impact  
Assessment for the Proposed  
Rabbit Ings Regeneration Scheme  
near Royston, Barnsley.

On behalf of the City of Wakefield Metropolitan  
District Council & Yorkshire Forward.

By WYGE

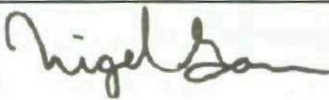
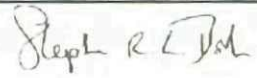
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| Reference: A039273/24ept2008/V1                                                                                                                                                                                               |           |                          |                                                                                      |                                                                                       |
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| Issue                                                                                                                                                                                                                         |           | Prepared by              | Checked by                                                                           | Verified by                                                                           |
| V1                                                                                                                                                                                                                            | Sept 2008 |                          |  |  |
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## 1.0 INTRODUCTION

This report presents the findings of an air and dust impact assessment with respect to the proposed redevelopment of a former spoil heap, drift mine and derelict recreation ground at Rabbit Ings regeneration Scheme, Royston, North-East Barnsley. The site is accessed via Lund Hill Lane. The development area is currently not utilised and is vacant.

The proposals by the City of Wakefield Metropolitan District Council (CWMDC) and Yorkshire Forward (YF) will primarily involve the importation of some soil making materials, regrading of surfacing and reclamation works to provide formal and informal recreation uses to include sports pitches with two team changing facilities with ancillary car parks, and informal open space areas with landscape and ecological enhancements.

The construction phase of the development has been identified as the most significant phase in terms of its potential air quality effect and the assessment therefore concentrates on the effects of the construction phase. It has been identified that nitrogen dioxide (NO<sub>2</sub>), respirable particulate (PM<sub>10</sub>) and dust are likely to be the main pollutants that should be assessed in relation to the development.

An air quality and dust impact assessment has been carried out to determine the likely worst case construction impacts of the proposed redevelopment.

The following scenarios for air quality pollutants have been considered:

- 2008 Existing (Model verification Only)
- 2008 'without' construction phase
- 2008 'with' the construction phase

### 1.1 National Legislative Context

The Environment Act 1995 introduced legislation for local management of air quality. Part IV introduced a statutory duty for local authorities to review and assess the air quality within their districts and to identify areas where further local measures are required to achieve the air quality standards shown in Table 1.1 below. Where the standards are not likely to be met the local authority has a duty to declare an Air Quality Management Area (AQMA) and to publish an Air Quality Action Plan to demonstrate how it intends to work towards achieving the standards.

The proposal site is not currently within an Air Quality Management Area and the proposal site is predominantly a rural location.

Air quality is a material planning consideration. Planning Policy Statement 23 'Planning and Pollution Control' provides some national guiding principles for air quality in the planning context. Annex 1 of the Statement comments that the impact of ambient air quality is likely to be particularly important;

- where the development is proposed inside, or adjacent to, an Air Quality Management Area (AQMA) designated under Part IV of the Environment Act 1995;
- where the development could in itself result in the designation of an AQMA; and
- where to grant planning permission would conflict with, or render unworkable, elements of a Local Authorities air quality action plan.

### 1.2 National Air Quality Objectives

The UK Air Quality Standards (UK-AQS) standards are defined in accordance with the recommendations of the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO) and define pollution concentration levels that minimise risks to health. The UK-AQS Objectives are policy targets, as shown in Table 1.1 overleaf, and have been set with regard to that which is realistically achievable within the timescale specified. It should be noted that the approach adopted by the strategy is to apply the objectives where 'members of the

public, in a non-occupational capacity and at locations close to ground level, are likely to be exposed over the averaging time of the objective'.

**Table 1.1 National Air Quality Objectives**

| Pollutant                      | Objective                                                                               | Measured As  | Target Date |
|--------------------------------|-----------------------------------------------------------------------------------------|--------------|-------------|
| Nitrogen dioxide*              | 200 $\mu\text{g}/\text{m}^3$ (105ppb)<br>Not to be exceeded more than 18 times per year | 1 Hour Mean  | 31/12/2011  |
|                                | 40 $\mu\text{g}/\text{m}^3$ (21ppb)                                                     | Annual Mean  | 31/12/2011  |
| Particles ( $\text{PM}_{10}$ ) | 50 $\mu\text{g}/\text{m}^3$<br>Not to be exceeded more than 35 times per year           | 24 Hour Mean | 31/12/2010  |
|                                | 40 $\mu\text{g}/\text{m}^3$                                                             | Annual Mean  | 31/12/2010  |

Notes:  $\mu\text{g}/\text{m}^3$  - micrograms per cubic metre

There is no prescribed UK Air Quality Standards for deposited dust because this is a form of nuisance rather than a potential health risk. In light of this, guidance levels taken from Minerals Planning Statement 2 Annex 2 have been used to assess monitored dust levels. The levels quoted in this guidance are summarised in table 1.2.

**Table 1.2 Guidance for Dust levels**

| Pollutant      | Standard                   | Measured As     | Target Date |
|----------------|----------------------------|-----------------|-------------|
| Deposited Dust | 200 $\text{mg}/\text{m}^2$ | Monthly average | N/A         |

### 1.3 Traffic Assessment Methodology

The air quality assessment includes the establishment of baseline ambient air quality and an evaluation of impacts associated with the construction and operational phases of the development. The assessment is primarily based on the effects of changes in traffic volumes as a result of the activity.

In order to characterise baseline conditions surrounding the site, identification of point and mobile emission sources within a 3 km radius are identified. In the absence of detailed site-specific data, White Young Green Environmental (WYGE) undertook a monitoring program to establish the relative local distribution of  $\text{NO}_2$  as this is the pollutant that was identified to be of most concern in this area due to an increase in vehicle movements. Diffusion tubes were exposed at 6 locations surrounding the proposal site to estimate baseline levels of  $\text{NO}_2$ .

Dust Frisbee gauges were deployed for the same period to measure current baseline deposition levels of dust at the site boundary.

The effects of increased traffic movements associated with the development have been predicted using ADMS Roads. This is an Environment Agency approved and fully validated modelling system for the prediction of the dispersion of air pollution based on Gaussian dispersion theory. Full details of the models validation can be found on the following web site, <http://www.cerc.co.uk/software/publications.htm>.

The methods used in constructing the model have been undertaken in accordance with recommendations outlined by the model developers, Cambridge Environmental Research Consultants (CERC). The most significant factors that affect model results are the following:

- background concentrations;
- meteorological data;
- source inputs (traffic data, stack emissions data).

Data input in to the model regarding traffic loads was based on a 2008 Traffic Assessment undertaken by White Young Green Transport (WYGT).

Traffic data was input into the ADMS Roads model to verify monitored results and predict NO<sub>2</sub> and PM<sub>10</sub> concentrations at key receptor locations surrounding the site and at specified distances from all roads affected by the development. The 2011 predicted 'with' and 'without' development scenarios have not considered traffic flows for any future committed developments and road schemes surrounding the site. Other uses of the site which have the potential to generate emissions from their activities (such as construction plant) are beyond the scope of this assessment.

#### 1.4 Dust methodology

A baseline survey of existing dust levels were taken at two locations on the Rabbit Ings site. The results of the baseline survey were assessed against the dust level standard outlined in table 1.2 below. The baseline survey has been used to undertake qualitative assessment of impacts on local air quality due to construction. Mitigation measures are proposed for inclusion of a dust management plan for all likely and significant construction impacts identified.

#### 1.5 Impact Significance

The criteria used in this report for the traffic impact assessment of impact significance on NO<sub>2</sub> has been described with regard to updated guidance from NCSA 'Development Control: Planning for Air Quality' (2006) as shown in Table 1.3 below.

**Table 1.3 Significance Matrix**

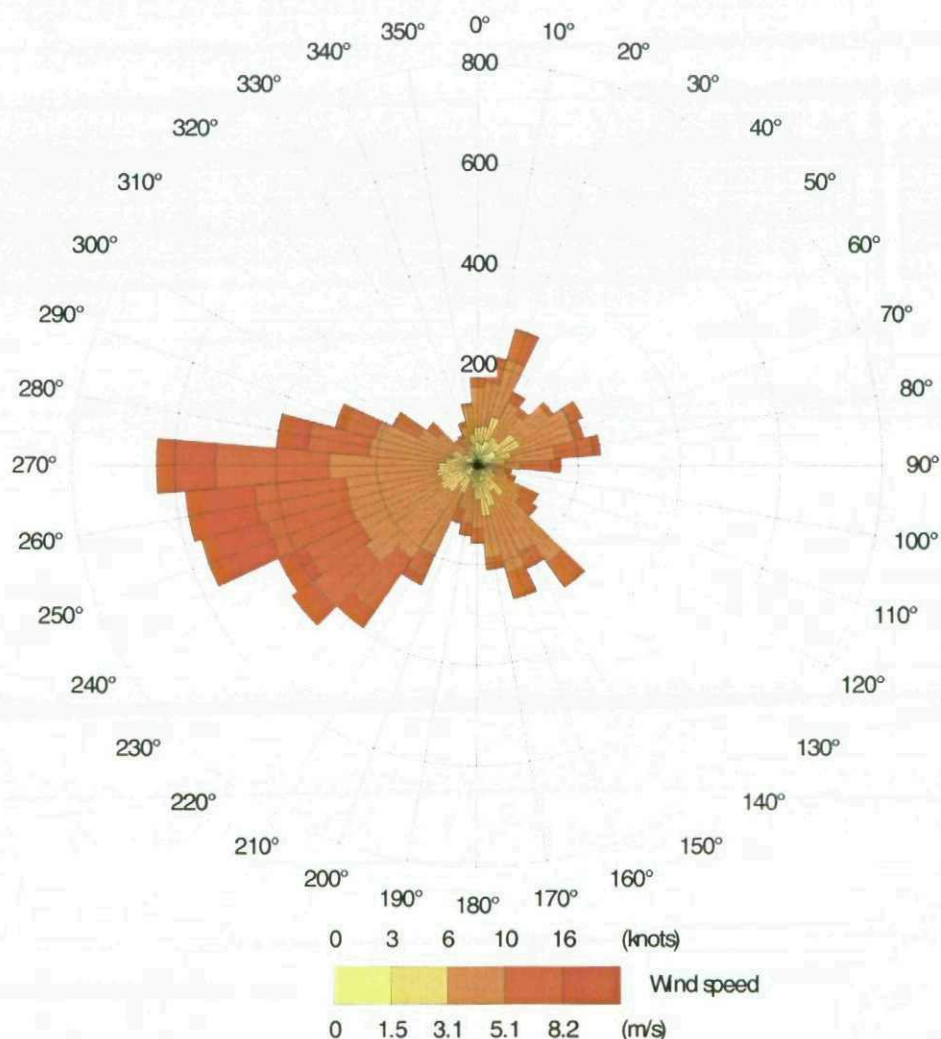
| Magnitude (Change in NO <sub>2</sub> Levels) | Significance Relative to Existing Site NO <sub>2</sub> Levels |                                                   |                                       |                                 |
|----------------------------------------------|---------------------------------------------------------------|---------------------------------------------------|---------------------------------------|---------------------------------|
|                                              | Above Standard With Scheme                                    | Below Standard Without Scheme / Above With Scheme | Marginally Below Standard With Scheme | Well Below Standard With Scheme |
| Very Large (>25% Change)                     | Very Substantial                                              | Very Substantial                                  | Substantial                           | Moderate                        |
| Large (15-25% Change)                        | Very Substantial                                              | Very Substantial                                  | Moderate                              | Slight                          |
| Medium (10-15% Change)                       | Substantial                                                   | Substantial                                       | Moderate                              | Slight                          |
| Small (5-10% Change)                         | Substantial                                                   | Substantial                                       | Slight                                | Slight                          |
| Very Small (1-5% Change)                     | Slight                                                        | Moderate                                          | Slight                                | Negligible                      |
| Extremely Small (<1% Change)                 | Slight                                                        | Slight                                            | Negligible                            | Negligible                      |

## 2.0 BASELINE CONDITIONS

### 2.1 Meteorology

Meteorological conditions can have a significant influence over air pollutant concentrations and dispersion within the atmosphere. Pollutant levels can vary significantly from season to season as well as year to year, thus any long-term trends need to be established using several years of data. The ADMS model calculates the dispersion of pollutants on an hourly basis using a year of local hourly meteorological data. The meteorological data used in this assessment was a combination of data derived from Sheffield City Airport MET station for the year 2006, which was the nearest meteorological station with all the complete parameters necessary for the ADMS model. The wind rose for this MET station is illustrated in Figure 1 below.

**Figure 1 Sheffield City Airport MET station 2006**



## 2.2 Emission and Potential Dust Sources

Observations made on site identified that Monckton Coke and Chemical Works on Lund Hill Lane as a significant stationary emission sources relating to background air quality on and around the Rabbit Ings site. Table 2.1 below indicates the emissions from the works in 2006 according to the Environment Agency who regulate the site. The closest sensitive receptor is a Nursery located directly off Lund Hill Lane just on the North West side of the proposed site.

**Table 2.1 Estimated Coking works Emissions 2006**

| Pollutant Substance                   | Total Emissions/year |
|---------------------------------------|----------------------|
| Ammonia                               | <1t                  |
| Benzene                               | <100kg               |
| Carbon dioxide                        | 36239t               |
| Carbon monoxide                       | 190t                 |
| Particulate matter - total            | 80t                  |
| Sulphur oxides (as SO <sub>2</sub> )  | 1773t                |
| Benzo(a)Pyrene                        | 32kg                 |
| Nitrogen oxides (as NO <sub>2</sub> ) | 332t                 |

## 2.3 Sensitive Receptors to air quality

Receptor locations were selected to represent properties within 200m of roads affected by the proposed development, with particular attention to the exits and entrances of any roads which show an increase in traffic. Beyond 200m, the contribution of vehicle emissions to local pollution levels is not significant (Design Manual for Roads for Roads and Bridges, Volume 11, Section 3, Part 1). The locations of these receptors are shown on SK02 of Appendix A. Receptor locations have been positioned at the facades of residential properties.

**Table 2.2 Existing Nitrogen Dioxide and PM<sub>10</sub> Receptor Locations**

| Monitoring Location | Name                                               |
|---------------------|----------------------------------------------------|
| REC 1               | 315 Midland Road, (façade)                         |
| REC 2               | day nursery (Lund Hill Lane)                       |
| REC 3               | Lane Ellis Laithe, Church Lane (façade)            |
| REC 4               | Monckton Grange, (Lund Hill Lane) (façade)         |
| REC 5               | Harwood Cottage, Raven Lane (façade)               |
| REC 6               | Front façade of Ellis Laithe, Church Lane (façade) |
| REC 7               | 243 Midland Road, West side (façade)               |

## 2.4 Sensitive Receptors to Dust

The assessment uses Minerals Policy Statement 2, which provides a broad category of uses in terms of their sensitivity to nuisance dust, as shown in Table 2.3 below.

Table 2.3 Examples of Dust-sensitive Receptors

| High Sensitivity        | Medium Sensitivity        | Low Sensitivity          |
|-------------------------|---------------------------|--------------------------|
| Hospitals and clinics   | Schools                   | Farms                    |
| Retirement homes        | Residential areas         | Light and heavy industry |
| Hi-tech industries      | Food retailers            | Outdoor storage          |
| Painting and furnishing | Glasshouses and nurseries |                          |
| Food processing         | Horticultural land        |                          |
|                         | Offices                   |                          |

This guidance suggests that significant nuisance is only likely to occur when the dust covers surfaces and is visible in contrast with adjacent clean areas, especially when it happens regularly. Severe dust nuisance occurs when the dust is perceptible without a clean reference surface. Earthwork activities have the potential to suspend dust, which could result in annoyance of residents surrounding the site. Measures should be taken to minimise the emissions of dust as part of good site practice. Particles greater than 10µm are likely to settle out relatively quickly and may cause annoyance due to their soiling capability. Research indicates that 70% of dust emissions typically settle within 200m of their source and only 10% remain in the air at 400m away. There are no formal standards or criteria for nuisance caused by deposited particles, however, a deposition rate of 200mg/m<sup>2</sup>/day is often presented as a threshold for serious nuisance though this is usually only applied to long term exposure as people are generally more tolerant of dust for a short or defined period.

Based on an investigation off the site there are a number of properties that could potentially be affected by dust generated or increased by earthwork activity around the Rabbit Ing site. The closest residential properties to the proposed earthworks site entrance (West side) is The Laurels and Monkton Grange located 150 - 200m North West of the site entrance. It is expected that the key impact with regard to the earthworks is likely to be HGV vehicle trips to and from the site leading to potential soiling of the roads and re-entrainment of dust in the air due to vehicle movements. The on-site earthwork phase activities are also a potential source of dust emissions. MPS2 states that:

*"Large dust particles (greater than 30 µm), which make up the greatest proportion of dust emitted from mineral workings, will largely deposit within 100m of sources. Intermediate-sized particles (10–30 µm) are likely to travel up to 200–500m. Smaller particles (less than 10 µm) which make up a small proportion of the dust emitted from most mineral workings are only deposited slowly but may travel 1000m or more."*

In addition to this the Mineral Planning Statement (MPS Annex 2) indicates that receptors that are more than 200m away from the dust source are unlikely to be as affected as those that are within 100m of the dust source.

The site can be accessed from all routes leading to Lund Hill Lane, however it is understood that access is restricted to HGV vehicles from Midland Road, through Royston. To support this a HGV travel plan has been designed and will be issued to all drivers travelling to the site. The current access is opposite the HGV entrance to the Monckton Coke and Chemical Works off Lund Hill Lane.

## 2.5 Baseline Ambient Air Survey

A diffusion tube survey was undertaken by WYG to determine the current NO<sub>2</sub> levels in the area surrounding the proposed development. Drawing SK01 indicates the location of each air tube monitoring location surrounding the proposed site and table 2.4 describes the location.

**Table 2.4 Nitrogen Dioxide Monitoring Locations**

| Monitoring Location | Name                                  |
|---------------------|---------------------------------------|
| WYG 1               | 315 Midland Road, Roadside            |
| WYG 2               | Ellis Laithe, Church Lane             |
| WYG 3               | Greenside off Hall Field Lane         |
| WYG 4               | Sandybridge Lane (industrial estate)  |
| WYG 5               | Opposite day Nursery (Lund Hill Lane) |
| WYG 6               | On site (South east corner)           |

All diffusion tubes were exposed for a period of between 2-6 weeks between 18/02/08 and 23/04/08 and subsequently analysed by Gradko International Ltd. The results of the site-specific survey are in Table 2.5 below.

**Table 2.5 Results of Site-specific Short Term NO<sub>2</sub> Monitoring Program**

| Monitoring Location | Period 1            | Period 2            | Average | Corrected Average (0.89) |
|---------------------|---------------------|---------------------|---------|--------------------------|
|                     | 18/02/08 – 19/03/08 | 19/03/08 – 23/04/08 |         |                          |
|                     | µg/m <sup>3</sup>   |                     |         |                          |
| WYG 1               | 22.75               | 20.52               | 21.64   | 19.47                    |
| WYG 2               | 25.42               | 26.14               | 25.78   | 23.20                    |
| WYG 3               | 20.94               | 19.33               | 20.14   | 18.12                    |
| WYG 4               | 21.11               | 19.82               | 20.47   | 18.42                    |
| WYG 5               | 22.93               | 21.58               | 22.26   | 20.03                    |
| WYG 6               | 25.74               | 20.18               | 22.96   | 20.66                    |

The results from the site-specific monitoring regime have been adjusted by using the national bias correction factors taken from the AEA website. The average correction factor used (0.89) has been determined based on national tubes analysed by GRADKO International Ltd, with a 20 % TEA Analysis for the most up to date period.

The WYG site-specific monitoring results indicate that all diffusion tube locations are currently well below the annual National Air Quality Objective for 2011(40 µg/m<sup>3</sup>).

## 2.6 Baseline Ambient Dust Survey

Frisbee dust deposit gauges were installed at two locations from the 18<sup>th</sup> February - 23<sup>rd</sup> April 2008, with the rain-collecting bottles replaced approximately every four weeks for 2 periods. Dust deposition rates have been measured from the collected rain water on two separate occasions. See SK01 for dust monitoring locations.

**Table 2.6 Dust Measurement Locations**

| Location Reference | Location Name                  |
|--------------------|--------------------------------|
| D1                 | West of Rabbit Ings Site       |
| D2                 | South East of Rabbit Ings Site |

## 2.7 Dust Survey Results

The results show that current background dust levels surrounding the Rabbit Ings site are all below 200 mg/m<sup>2</sup>. Location D1 is considered to be worst case as its location is adjacent to the Monckton Coke and Chemical Works which is expected to be a large contributor.

**Table 2.7 Frisbee Deposit Guage Results**

| Period number | Location | Time Date  | Time finish | Dust Deposition Rate (mg/m <sup>2</sup> /day) |
|---------------|----------|------------|-------------|-----------------------------------------------|
| 1             | D1       | 18/02/2008 | 19/03/2008  | 112                                           |
|               | D2       | 18/02/2008 | 19/03/2008  | N/A                                           |
| 2             | D1       | 19/03/2008 | 23/04/2006  | 101                                           |
|               | D2       | 19/03/2008 | 23/04/2006  | 72                                            |

*N/A: Sample vandalised and no results could be obtained*

### 3.0 Assessment of Impacts

#### 3.1 NO<sub>2</sub> AND PM<sub>10</sub> EMISSIONS

Traffic is identified as one of the key dominant emission sources that are likely to increase in the area as a result of any construction activity. Predictions of air quality at the site have been undertaken for the construction phase of the development using ADMS Roads. The following sections outline model inputs and assumptions made in assessing the significance of impacts upon ambient air quality with regard to existing sensitive receptors.

#### 3.2 Assessment of Air Quality Impacts from Changes in Traffic Flows

Based on site observations a number of sensitive receptors were identified surrounding the site as having the potential to be most effected by changes in ambient air quality from increased traffic movements. Traffic data, taken from observations made onsite was used as inputs into the ADMS Roads model to predict NO<sub>2</sub> and PM<sub>10</sub> concentrations at key receptor locations surrounding the site and at specified distances from all roads expected to be affected by the temporary site operation.

#### 3.3 Existing and Predicted Traffic Flows

Traffic flows for the 'with' and 'without' scenarios are summarised in Table 3.1 below. Traffic flows input into the model have verified the monitoring data obtained from the site and this is considered a good representation of current traffic conditions. However it is important to note that the absolute pollutant levels are not being assessed as all are well below the standard and the difference between the two scenarios should be looked at to appreciate the magnitude in impact difference over baseline conditions. With regard to proposed HGV traffic the model used a worst case of a 200 AADT (8 movements/hour) increase. A marginal increase of light good vehicles (LGV) was also input into the model to account for new employee trips to the Rabbit Ings site. The worst case assumptions include for additional HGV requirements in the opening year of the development. Current forecasted operational HGV traffic flows are estimated to be 38 movements per day (19 arrivals and 19 departures), however this figure may change – hence the use of the worst case scenario.

**Table 3.1 Traffic Flows**

| Road Link         | AADT    |      | Speed (kph) | %HGV without Development | %HGV with Development |
|-------------------|---------|------|-------------|--------------------------|-----------------------|
|                   | Without | With |             |                          |                       |
| Church Lane North | 4800    | 5280 | 50          | 10                       | 10                    |
| Midland Road      | 4800    | 5280 | 48          | 5                        | 5                     |
| Lund Hill Lane    | 7200    | 7680 | 60          | 5                        | 5                     |
| Sandybridge Lane  | 2400    | 2880 | 48          | 10                       | 10                    |
| Raven Lane        | 500     | 1440 | 50          | 5                        | 5                     |
| Church lane South | 4800    | 5280 | 48          | 5                        | 5                     |
| Hall Field Lane   | 2400    | 2880 | 50          | 5                        | 5                     |

All roads expected to make a contribution have been included within Table 3.1 above. It is noted that some smaller roads have been excluded, as contributions from these roads will be represented within the background concentrations.

### 3.4 Background Concentrations

Background concentrations used within the ADMS Roads model were originally referenced from the UK National Air Quality Information Archive database based on the National Grid Coordinates of the 1 x 1 km grid square nearest to the receptor.

It is noted that the background air pollution maps were produced using 2010 data. In order to estimate background concentrations for the assessment year (2008), conversion factors were obtained from the Local Air Quality Management web page ([www.airquality.co.uk](http://www.airquality.co.uk)).

#### 4.0 ADMS Modelling Results

The ADMS Model was used to predict concentrations of NO<sub>2</sub> and PM<sub>10</sub> at relevant receptor locations surrounding the Rabbit Ings site. The results of the ADMS modelling exercise are summarised in Table 4.1 and 4.2 below for scenarios 'with' and 'without' the construction impact in the development the year 2008. The contour plots illustrating the difference are contained in SK03.

**Table 4.1 Predicted Annual Concentrations of NO<sub>2</sub> at each Receptor Location**

|       | Receptor                                           | Without 2008 | With 2008 | Difference | % Difference |
|-------|----------------------------------------------------|--------------|-----------|------------|--------------|
| REC 1 | 315 Midland Road, (façade)                         | 27.23        | 27.78     | 0.55       | 1.96         |
| REC 2 | Day Nursery (Lund Hill Lane)                       | 31.85        | 33.90     | 2.05       | 6.06         |
| REC 3 | Lane Ellis Laithe, Church Lane (façade)            | 25.93        | 26.60     | 0.67       | 2.52         |
| REC 4 | Monckton Grange, (Lund Hill Lane) (façade)         | 27.69        | 28.76     | 1.06       | 3.70         |
| REC 5 | Harwood Cottage, Raven Lane (façade)               | 26.27        | 28.10     | 1.84       | 6.54         |
| REC 6 | Front façade of Ellis Laithe, Church Lane (façade) | 28.12        | 29.27     | 1.15       | 3.93         |
| REC 7 | 243 Midland Road, West side (façade)               | 26.30        | 26.69     | 0.39       | 1.48         |

**Table 4.2 Predicted Concentrations of PM<sub>10</sub> at each Receptor Location**

|       | Receptor                                           | Without 2008 | With 2008 | Difference | % Difference |
|-------|----------------------------------------------------|--------------|-----------|------------|--------------|
| REC 1 | 315 Midland Road, (façade)                         | 20.26        | 20.30     | 0.04       | 0.21         |
| REC 2 | Day Nursery (Lund Hill Lane)                       | 20.49        | 20.60     | 0.11       | 0.53         |
| REC 3 | Lane Ellis Laithe, Church Lane (façade)            | 20.12        | 20.10     | 0.02       | 0.10         |
| REC 4 | Monckton Grange, (Lund Hill Lane) (façade)         | 20.23        | 20.30     | 0.07       | 0.34         |
| REC 5 | Harwood Cottage, Raven Lane (façade)               | 20.14        | 20.20     | 0.06       | 0.32         |
| REC 6 | Front façade of Ellis Laithe, Church Lane (façade) | 20.25        | 20.30     | 0.05       | 0.26         |
| REC 7 | 243 Midland Road, West side (façade)               | 20.19        | 20.20     | 0.01       | 0.06         |

Notes: 1. All concentrations are provided in µg/m<sup>3</sup>

The predicted maximum change in NO<sub>2</sub> is 6.54%. The predicted maximum change in PM<sub>10</sub> is 0.53%.

The results for NO<sub>2</sub> levels show that no receptors (those modelled closest to the site) are predicted to have NO<sub>2</sub> levels above the National Objective in 2008 with or without the

development when compared to Table 1.1 above. Therefore at these receptors it is considered that the significance of impact would be 'negligible' to 'slight'.

With regard to  $PM_{10}$  there are also no receptor locations that are predicted to exceed any annual average or short term National Objectives in the opening year when compared to Table 1.1 above. The impacts of the scheme on existing and proposed receptors are considered to be 'negligible'.

#### 4.1 DUST EMISSIONS

The results from the Frisbee type dust gauges are approximately as would be expected for a rural location and the increased levels at D1 probably reflect an increased contribution from the local Monckton Coke and Chemical Works. The baseline survey indicates that deposited dust levels are currently below  $200 \text{ mg/m}^2/\text{day}$ .

#### 4.2 Emissions from General Activities and Haul Roads

There is the potential for dust levels to increase during dry or windy conditions or during specific activities and storage of restoration materials. To minimise windblown dust standard mitigation measures should be applied as detailed below.

Other than negligible emissions from vehicles and equipment the main emissions are likely to be dust and particulate matter generated during earth moving (particularly during dry months). The main potential effects of particulates/dust are:

- 1 Visual – dust plume, reduced visibility, coating and soiling of surfaces leading to annoyance, loss of amenity, the need to clean surfaces;
- 2 Physical and /or chemical contamination and corrosion of artefacts;
- 3 Coating of vegetation and soil contamination ;
- 4 Health effects due to inhalation, e.g. asthma or irritation of the eyes.

A number of other factors such as the amount of precipitation and other meteorological conditions will also greatly influence the amount of particulate matter generated.

The UK Air Quality Standards seek to control the health implications of respirable particulate matter  $PM_{10}$  (less than 10 micrometers in diameter). However, the majority of particles released from the proposed restoration works are likely to be greater than this in size. Never the less mitigation measures should still be taken to minimise these emissions as part of good site practice as detailed in below.

## **5.0 Mitigation Measures**

### **5.1 Direct Mitigation Measures**

#### **A. Wheel Washing and Access Road**

All vehicles using the existing access road at shall use a hard standing facility, to allow any excess dust or materials to settle before entering on to the highway. All vehicles with soils less than 500mm in diameter will be covered and secured. This should remove the majority of excess dust from vehicles. The main access road should ideally have a tarmac topped surface thus will not be a further source of dust. The access road will be wet swept along the full length of the road on a daily basis or more regularly, if necessary, during dry and windy weather conditions or other climatic or working conditions that generate excessive dust. All sweeping activities will be recorded in the site environmental log book.

#### **B. Haul Road Cutting and Bunds**

Together with noise mitigation, dust from the haul road is likely to be further mitigated by the appropriate use of cuttings and bunds.

#### **C. Direct Dousing of Stock Piles and Tipped Materials**

All stock piles and tipped materials will be doused on a daily basis prior to the establishment of a grass sward to help reduce the amount of wind blown particles (total suspended particles at the boundary of the site. Any soil mounds that are constructed for longer term use should be capped and seeded as soon as possible.

Water for such purposes will be permanently available on site including mobile sources such as a water bowser. As earthworks progresses close to the Lund Hill Lane dust suppression will be undertaken continually when wind is from the South East so as to minimise the amount of wind blown particles at this sensitive location.

### **5.2 Management Measures**

#### **D Location of Dust emitting Plant**

The location of plant should be sympathetic to any residence and should ideally be placed away from the prevailing down wind met conditions so that dust nuisance is minimised.

#### **E Signage and Customer Information**

Signs with 'all HGV vehicles must go through the wheel wash' will be appropriately displayed. In addition to this preferred network routes will be provided to HGV drivers to ensure that main arterial routes are utilised and that smaller routes are not unnecessary used.

10 mph speed limit signs will be appropriately displayed.

All customers will be given copies of the site user rules which will be enforced by the site manager. These rules include the speed, wheel washing and sheeting /securing conditions as above.

### **5.3 Maintenance, Monitoring and Records**

#### **G Daily Checks**

Daily checks of dust conditions will be undertaken together with a site walkover by the site manager to ensure that all dust sources are known and minimised. These checks will be reported in the site environmental log book. Meteorological forecasts will be observed to

ensure that enough provision (water and labour) is made to accommodate dust suppression particularly during hot dry and windy conditions.

#### H Weekly Checks

All road drains from the access road and serving the wheel washing facilities will be checked on a weekly basis and reported in the site environmental log book. The road and wheel washing drains will be cleaned and emptied on a monthly/regular basis and recorded in the site environmental log book.

## 6.0 CONCLUSIONS

Predicted nitrogen dioxide levels from road derived sources associated with the proposed restoration scheme show receptors are predicted not to have NO<sub>2</sub> levels above the annual average National Objective with or without the development in 2008. The maximum increase in NO<sub>2</sub> pollutant levels at residential receptors as a result of the Rabbit Ings activity is predicted to be 2.69 µg/m<sup>3</sup>, which is a 6.5% increase over existing levels directly north of the existing proposed entrance to the site. This is therefore considered to be of 'negligible' significance and 'minor' impact when assessed against the NSCA Significance Matrix in Table 1.3 above.

With regard to PM<sub>10</sub> from traffic there are also no sensitive receptor locations that are shown to be above the annual average or short term National Objectives in the opening year. The impacts of the scheme on existing receptors are also considered to be 'negligible' with a maximum predicted increase of 0.11µg/m<sup>3</sup>, which is a 0.53% increase over baseline conditions.

Baseline dust deposition levels have also been assessed. Existing dust levels are shown to be well below the nuisance guidance values set out in MPS 2 or national objectives for PM<sub>10</sub> at nearby sensitive receptors.

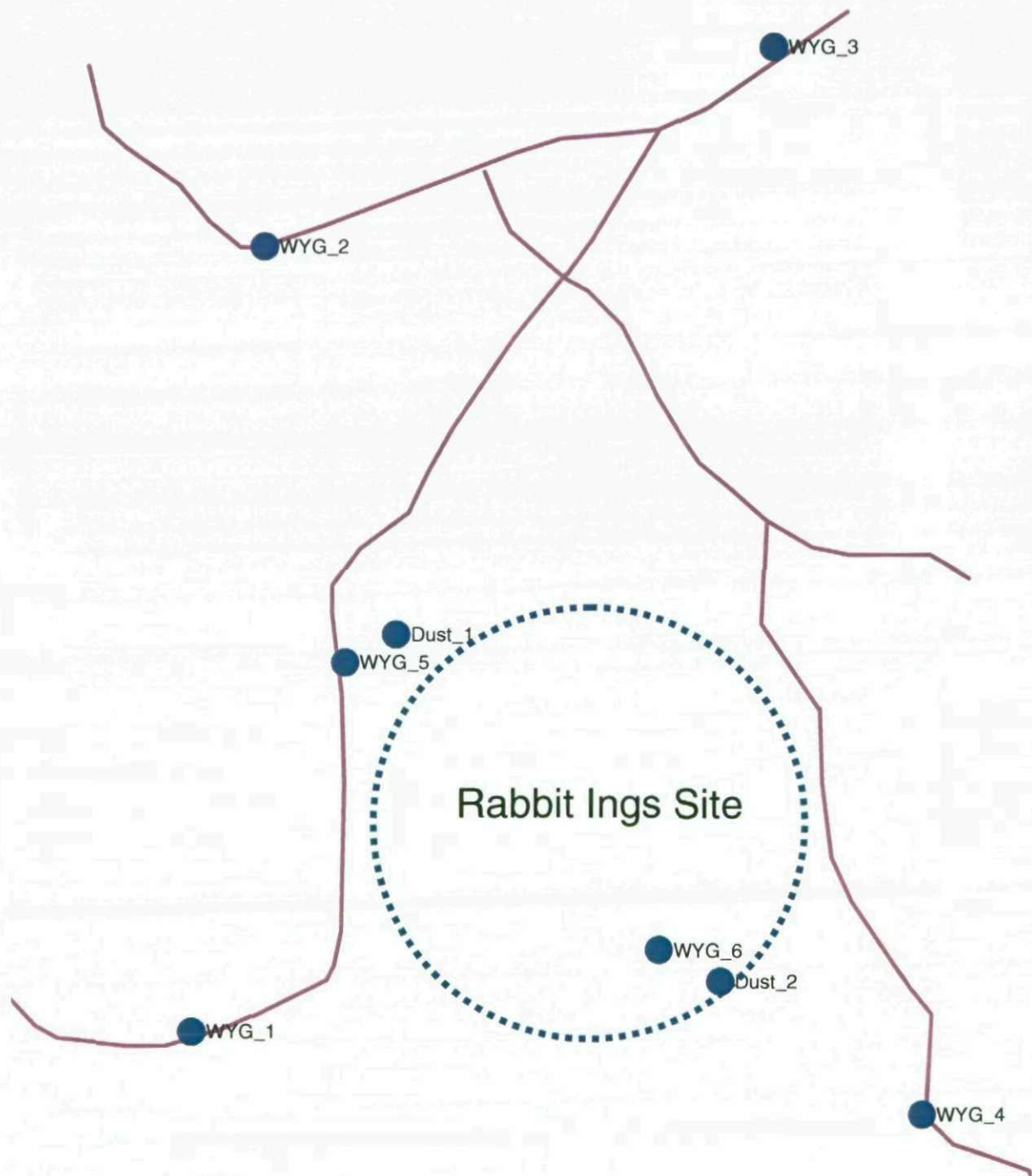
It is considered that the employment of the mitigation measures set out within this report will enable the development to progress in accordance with guidance contained in MPS 2. It is not considered that any increase of emissions from traffic and restoration activities on the proposed development would significantly change existing concentrations of air pollutants or cause concern for nearby sensitive receptors.

**APPENDIX A – SKETCHES**

Drawing SK01 – Monitoring Locations for NO<sub>2</sub> and Dust.

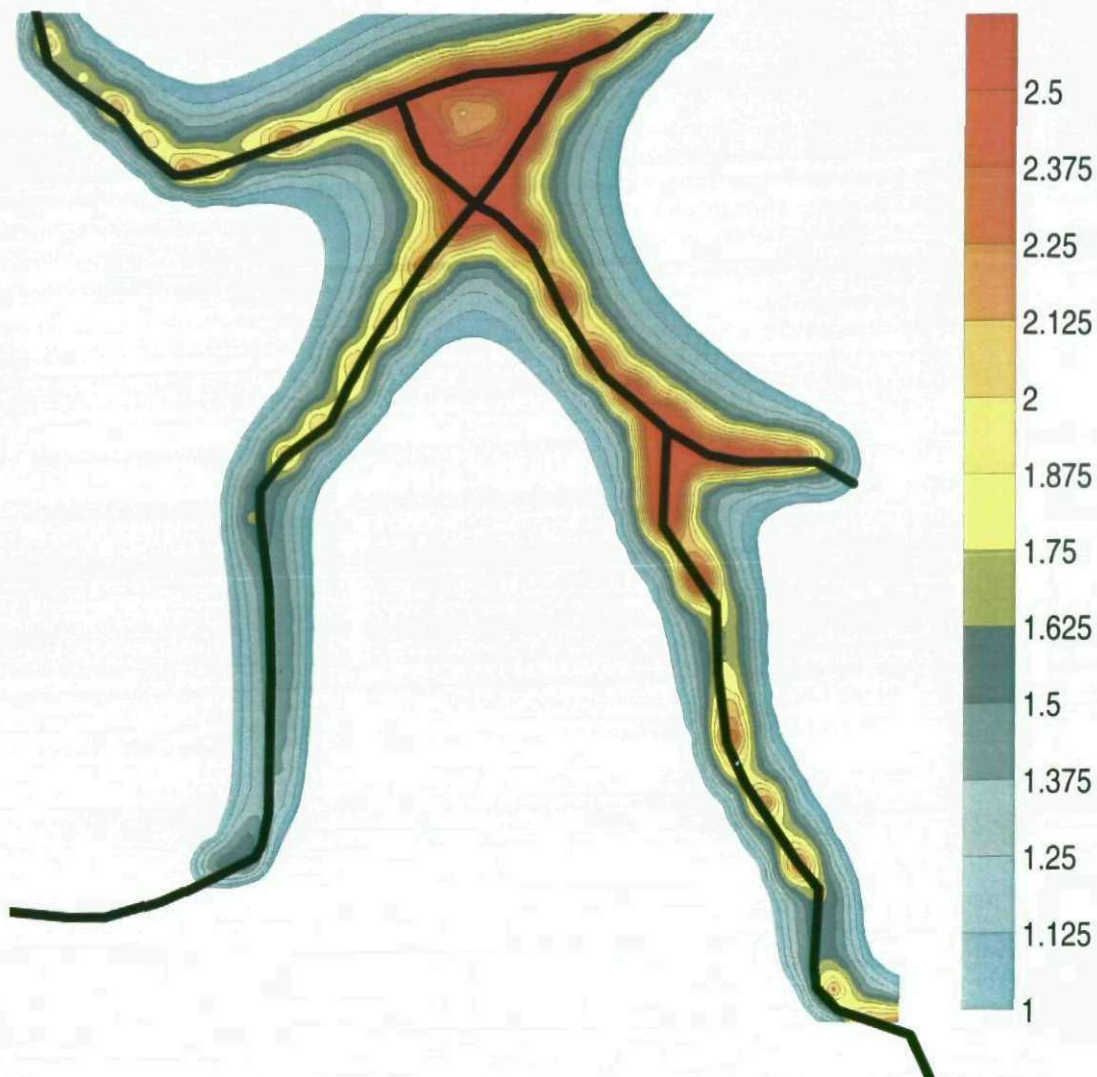
Drawing SK02 – Existing Modelled Receptor Locations

Drawing SK03 – NO<sub>2</sub> Difference concentration 'With' & 'Without' Construction Activity in 2008 µg/m<sup>3</sup>

**SK01 – Monitoring Locations for NO<sub>2</sub> and Dust.**

**SK02 – Existing Modelled Receptor Locations.**

**SK03 – Roadside NO<sub>2</sub> Difference Contribution 'With and without'  
the Rabbit INGS Construction 2008 ug/m<sup>3</sup>**



## APPENDIX B- REPORT CONDITIONS

**WHITE YOUNG GREEN ENVIRONMENTAL****AIR AND DUST IMPACTASSESSMENT****RABBIT INGS, ROYSTON, BARNSELEY**

*This report is produced solely for the benefit of English Partnerships and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise. This report, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site characteristics, especially liquid and gaseous materials, are likely to vary with time.*

*This report is based on a visual site inspection, the physical investigation as detailed and information supplied by those parties noted in the text. Some of the opinions are based on unconfirmed data and information and are presented in good faith without exhaustive clarification. The impact of our assessment on other aspects of the development requires evaluation by other involved parties. The possibility of the occurrence of pollutant levels not revealed by this research cannot be discounted.*

*Whilst confident in the findings detailed within this report, because there are no exact UK definitions in this matters, being subject to risk analysis, we are unable to give categoric assurances that they will be accepted by Authorities or Funds, etc. without question, as such bodies may have unpublished, often more stringent objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to WYGE. In time improved practices or amended legislation may necessitate a re-assessment.*

*The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief.*