

**AVENUE COKING WORKS**  
**AIR QUALITY AND ODOUR MONITORING PROGRAMME**  
**Summary of Results: May 2009**

## **1.0 Introduction**

This summary presents the results of the monitoring programme for May 2009, and an assessment of these results.

Air quality results are evaluated by comparison with the assessment criteria that were developed in the Jacobs report 'The Avenue Air Quality Management Programme Strategy Document' Issue 1, June 2002, and reviewed in 2006. Odour results are evaluated by comparison with the assessment criteria described in Environment Agency and VDI technical guidance documents.

## **1.1 Alterations, Downtime and Technical Difficulties**

During May 2009, the following amendments to the scope of routine fixed monitoring occurred due to equipment downtime:

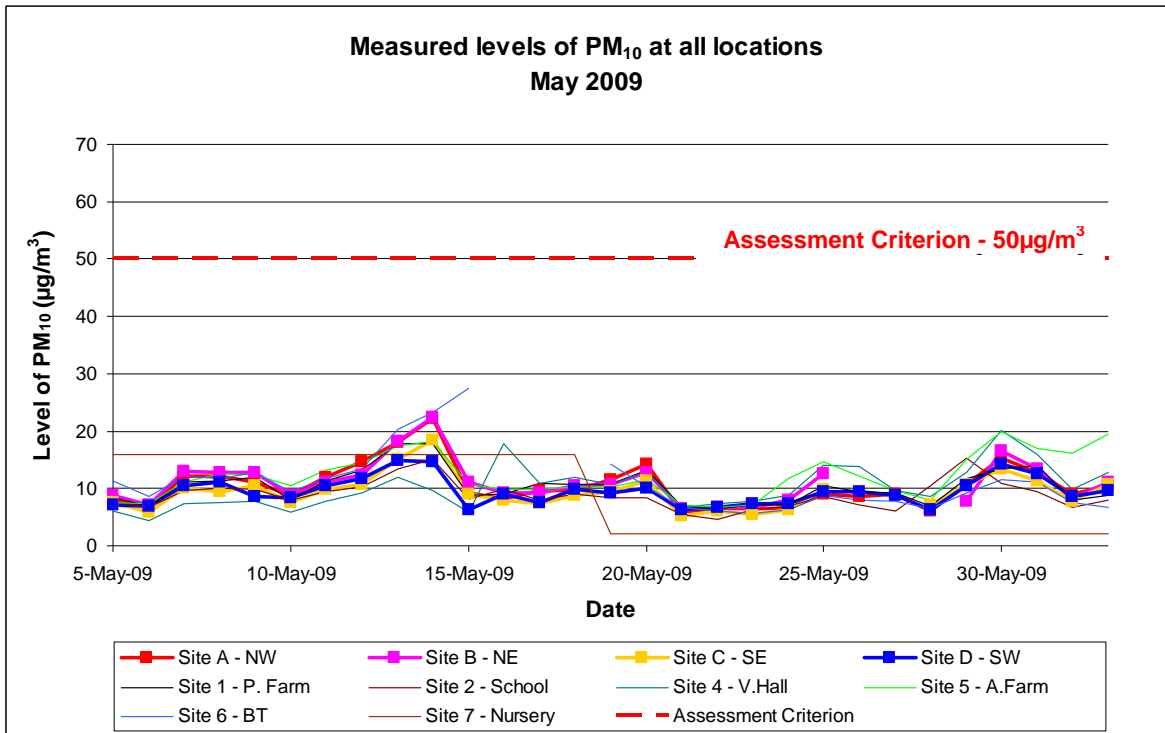
- a power failure at station 6, at 14:30 on 15 May, resulted in the loss of PM<sub>10</sub> data from the APM950 unit between 15 and 19 May. This was discovered and the APM unit restarted at 10:00 on 19 May.
- a power failure at station B at 13:30 on 25 May, due to damage caused by vandals, resulted in the loss of PM<sub>10</sub> data from the APM950 unit between 25 and 29 May. The APM unit did not restart when power was restored on 28 May and thus was manually restarted on 29 May at 13:15.
- a power failure at station C at 13:15 on 25 May, due to damage caused by vandals, resulted in the loss of PM<sub>10</sub> data from the APM950 unit between 25 and 28 May. The APM unit restarted when power was restored on 28 May at 09:45.
- as reported last month, in order to determine the technical feasibility and impacts on quality of rationalising the types/number of automatic monitors used for sampling for metals, cyanide, PAHs and phenols (M-type, Hi-vol and Mini-vol samplers – as proposed by the Air Quality Management Plan prepared by the remediation contractor), a 'filter-splitting trial' is currently being undertaken. This comprises cutting the filter from the duplicate APM950 unit at station A into 4 and undertaking analyses for these determinands on each of the portions, over a period of three months. This trial began at the filter-changeover in mid-April; no duplicate metals results are therefore available for the month.

## **1.2 Results from Routine Air Monitoring**

Of the substances monitored as part of the Avenue programme, statutory limits exist for benzene, PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub> and SO<sub>2</sub>. Graphs depicting monthly levels of these determinands against applicable assessment criteria are presented with the results, with the exception of benzene, as results for benzene are frequently below limits of detection (LODs). Although a statutory limit does not currently exist for deposited dust, a graph has also been prepared as this has been recognised as a potential issue at and around the Avenue site.

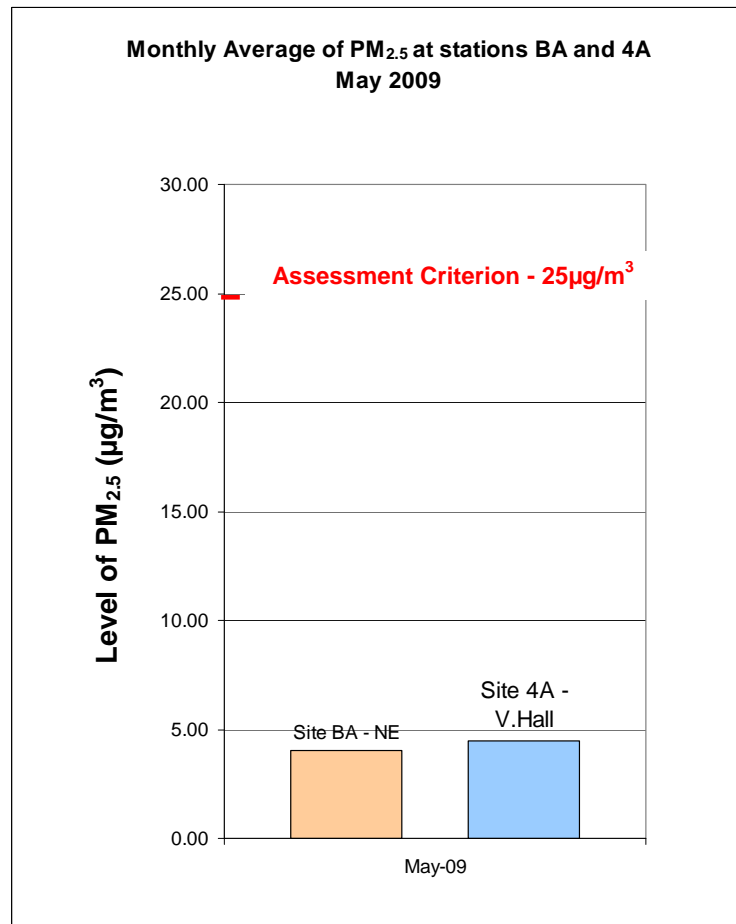
### 1.2.1 PM<sub>10</sub> Levels

The assessment level of 50µg/m<sup>3</sup> was not exceeded during the month, with the highest result being 23.24µg/m<sup>3</sup> at station 6 on 14 May. 27.55µg/m<sup>3</sup> was recorded at station 6 on 15 May; however, this result should be considered with caution due to downtime that occurred on 15 May.



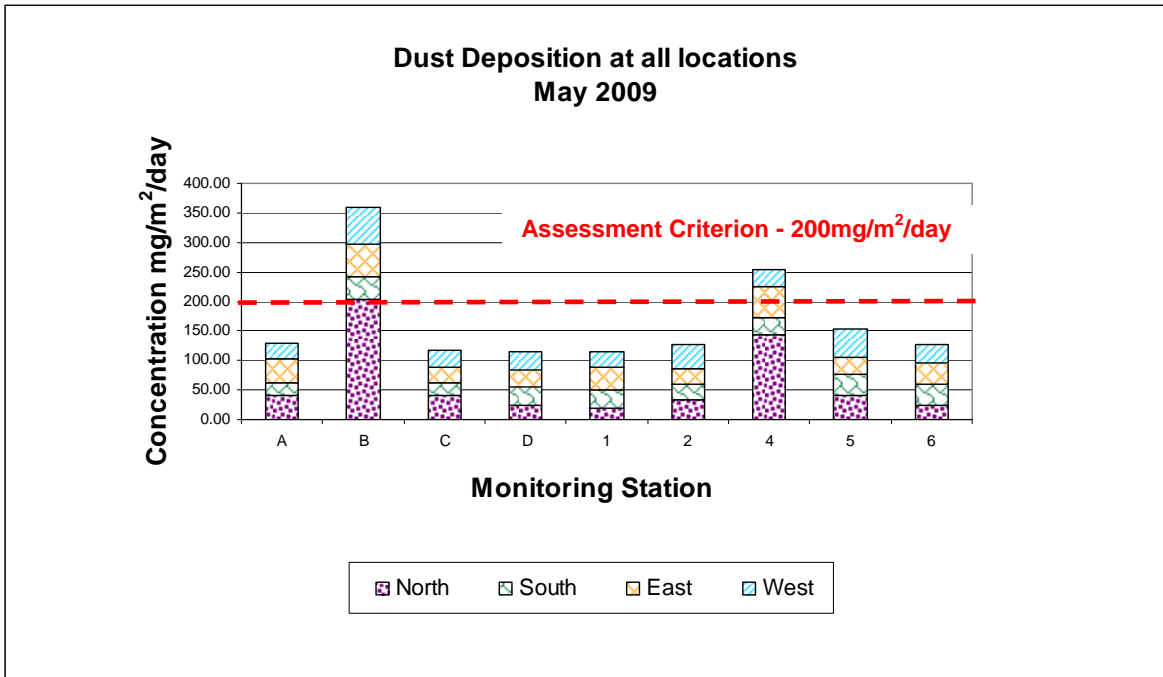
### 1.2.2 PM<sub>2.5</sub> Levels

The assessment level of 25µg/m<sup>3</sup> was not exceeded at on-site station B or off-site station 4 during the month, with the monthly mean result being 4.01µg/m<sup>3</sup> for station B, and 4.49µg/m<sup>3</sup> for station 4.



### 1.2.3 Deposited Dust

The assessment criterion level of 200mg/m<sup>2</sup>/day was exceeded at stations B and 4, with results being 359mg/m<sup>2</sup>/day and 253mg/m<sup>2</sup>/day respectively.

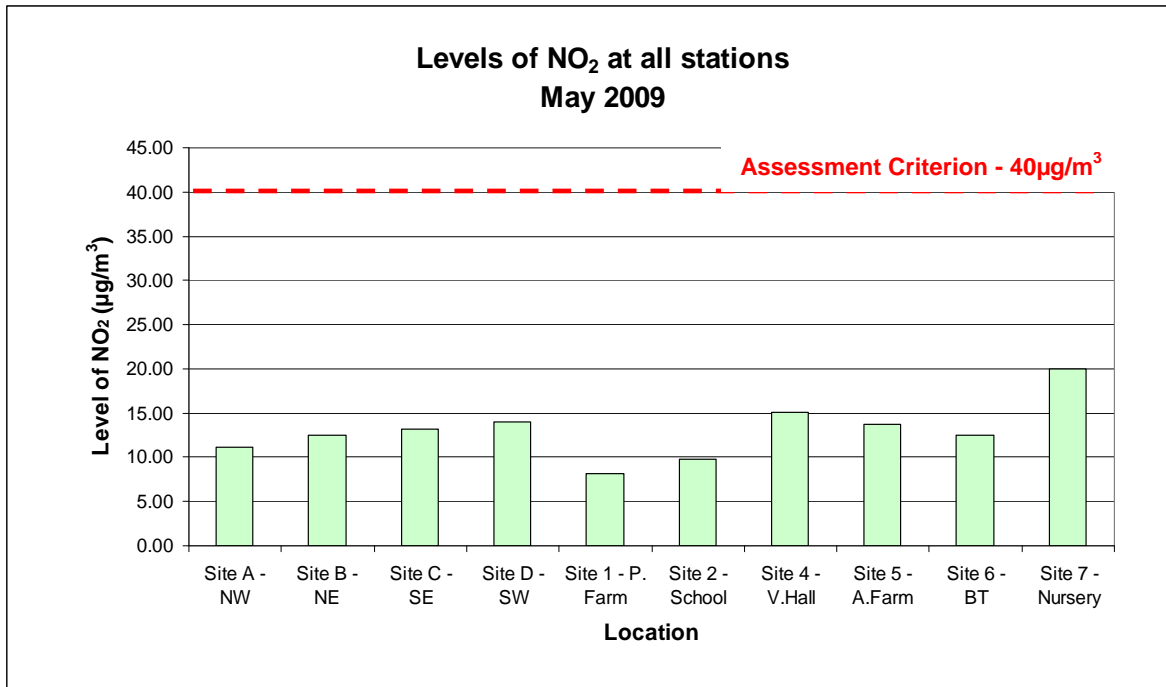


Although the exceedance of deposited dust was recorded at on-site station B, there is no further evidence to suggest that the source of the dust was due to conditions or activities at the Avenue site. No site activities that would be expected to generate significant levels of dust took place during the month, and no occurrences of excessive dust were identified by the Site Condition Manager during his regular visual checks.

The source of the dust does not appear to have impacted on a wider area. No on- or off-site monitoring stations in close proximity to station B experienced similarly high levels of dust, with dust levels at on-site stations A, C, and D being 129, 118, and 114mg/m<sup>2</sup>/day respectively. Although station 4 also recorded an exceedance, this station is of sufficient distance from station B and the results are not considered to be related (the fraction of dust comprising DDG usually settles out within a few hundred metres of source; station 4 is 1.7km from station B). Furthermore the majority of the dust at station 4 was encountered from the north, whereas the predominant wind direction during the period was southerly.

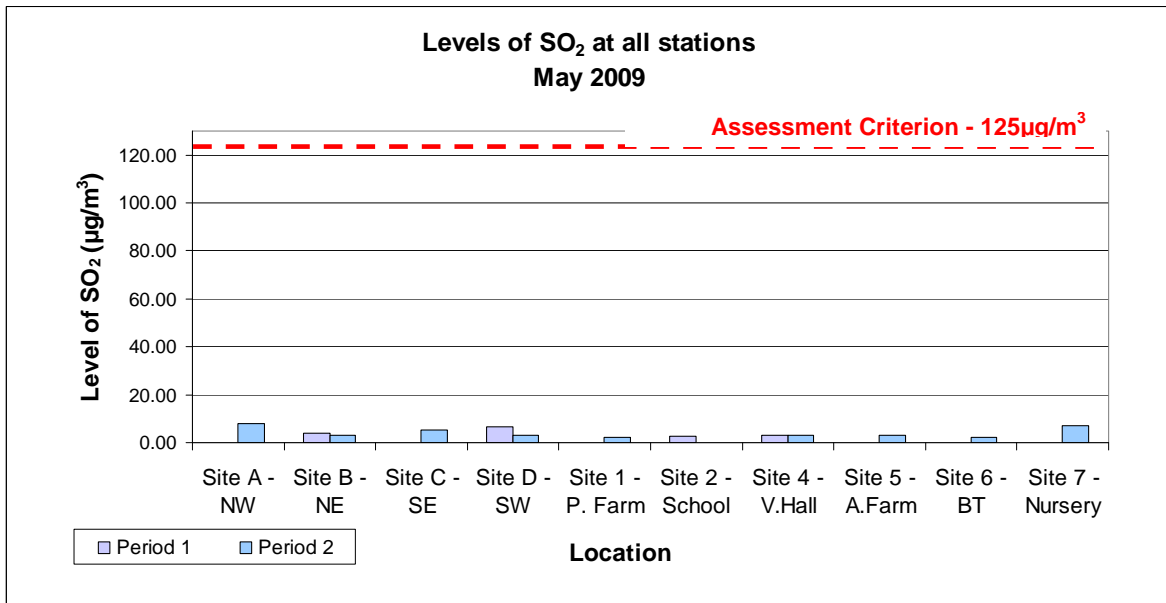
### 1.2.4 Nitrogen Dioxide

The assessment criteria level developed for NO<sub>2</sub> is 40µg/m<sup>3</sup>. No stations recorded NO<sub>2</sub> in exceedance of this level, with the highest NO<sub>2</sub> result being 20.03µg/m<sup>3</sup>, recorded at station 7.



### 1.2.5 Sulphur Dioxide

The assessment criteria levels developed for SO<sub>2</sub> is 125µg/m<sup>3</sup>. No stations recorded SO<sub>2</sub> in exceedance of this level, with the highest SO<sub>2</sub> level being 8.11µg/m<sup>3</sup> at station A in the second monitoring period.



### 1.2.6 BTEX Compounds

The assessment criteria limits for benzene and toluene are 5µg/m<sup>3</sup> and 1.9mg/m<sup>3</sup> per fortnight, respectively. No stations recorded levels of benzene or toluene above the LOD this month.

### 1.2.7 Metals

The only metal currently falling under the control of the UK Air Quality Strategy is lead, at a maximum concentration  $0.5\mu\text{g}/\text{m}^3$  (annual mean). The highest level of lead recorded was  $0.02\mu\text{g}/\text{m}^3$ , recorded at station C during the second period.

All other metals were below the assessment criteria developed for the site, and in many cases below LODs.

### 1.2.8 Cyanide

No National Air Quality Standard has been developed for cyanide; the assessment criteria suggested for the Avenue is a maximum concentration of  $50\mu\text{g}/\text{m}^3$  per fortnight. No stations recorded cyanide levels above the LOD during either monitoring periods.

### 1.2.9 Phenol(s)

The assessment criteria limits for phenol and cresol are  $48\mu\text{g}/\text{m}^3$  and  $220\mu\text{g}/\text{m}^3$  per fortnight, respectively. The reporting of phenols is subject to a LOD of  $0.2\mu\text{g}/\text{m}^3$  and no results were reported above this level.

### 1.2.10 PAHs

The maximum allowable fortnightly concentration of Coal Tar Pitch Volatiles is  $0.48\mu\text{g}/\text{m}^3$ , whilst for naphthalene the figure is  $126\mu\text{g}/\text{m}^3$ . No stations recorded concentrations in exceedance of these criteria during May 2009. The highest concentration of total coal tar pitch volatiles was  $0.01756\mu\text{g}/\text{m}^3$  recorded at station B during the first monitoring period, whilst the highest naphthalene result was  $0.0011\mu\text{g}/\text{m}^3$ , recorded at station A during the second period.

### 1.2.11 Quality Control Samples

As part of the routine monitoring programme, quality control samples are submitted in the form of duplicates for all sample media and blanks for phenols, cyanide, metals, PAHs and BTEX. This is to ensure that results generated are accurate and, essentially, reliable. The outcomes for May 2009 are as follows:

#### Media Blanks

The analysis of media blanks indicated no problems with the contamination of media used for the collection of samples during May 2009.

#### Duplicates

Duplicate  $\text{PM}_{10}$  samples taken at station A correlated well with original data during the month, with duplicate results ranging between 83% and 113% of original results.

Duplicate PAH results from station 1 correlated only moderately well with original results during both monitoring periods, with duplicate results for benzo(a)pyrene, dibenzo(ah)anthracene and benzo(ghi)perylene during the first period being 229%, 200% and 219% of the original, respectively, and the duplicate result for acenaphthene during the second period being 317% of the original.

Duplicate phenol samples were taken at station 1. No results were reported above the LOD of  $0.2\mu\text{g}/\text{m}^3$  during both monitoring periods, and as a result the duplicate results correlated exactly with original results.

Duplicate results for BTEX, cyanide,  $\text{SO}_2$  and  $\text{NO}_2$  taken from stations 6, A and B correlated well with original results during both monitoring periods.

No duplicate metals results were available for analysis due the split filter trial, as described in Section 1.1 above.

## 1.3 Results from Targeted Air Monitoring

Targeted monitoring is undertaken around specific site activities considered to have the potential to liberate airborne contaminants and also to monitor ambient conditions when no works are taking place. Due to the lack of potential for site activities to generate or liberate significant amounts of contaminative materials, targeted monitoring was not required during the month.

## **1.4 Results from Odour Monitoring**

### **1.4.1 Odour Diaries**

Background monitoring using odour diaries was suspended at the end of October 2008 following an 18 month period of monitoring; it was considered that a sufficient level of background data have been collected during this period. The odour diary programme is scheduled to resume prior to the remediation phase.

### **1.4.2 Sensory Field Odour Surveys**

There were no records of 'medium' odour annoyance impact or higher during the month.

### **1.4.3 Complaints**

No odour-related complaints were received during May 2009.