

Capitol Park, Unit D, Barnsley

Air Quality Assessment

Commercial Development Projects Limited

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Quality information

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1. Introduction

AECOM completed an air quality assessment in June 2016 to determine the local air quality impacts associated with a proposed development consisting of industrial and office units, alongside car parking for approximately 300 vehicles on undeveloped land on Capitol Close, Barnsley. The report, 'Capitol Park, Barnsley: Air Quality Assessment' (AECOM, 2016) was submitted as part of an outline planning application.

The outline application was awarded planning permission.

The following assessment appraises the potential local air quality effects of the detailed application for Unit D, within Capitol Park, for use as a Blood Establishment run by the NHS Blood and Transplant (NHSBT). The facility will provide blood components to hospitals in Yorkshire, Derbyshire, Nottinghamshire and Lincolnshire and operate 24 hours per day, 7 days per week and 52 weeks per year.

This assessment considers the change in traffic flow for the proposed NHS use compared to the approved use.

1.1 Site

The proposed Capitol Park development site is located to the north of Dodworth and west of the M1. The site is bounded by Whinby Road, Capitol Close and Higham Lane. Access to the site will be from Capitol Close.

The wider development site gained outline planning consent (ref 2016/0713) in October 2016, in support of proposals to develop an industrial estate within the Capitol Park site, which comprised 16,499sq.m of Industrial Use. As reserved matters application was then submitted for a proportion of the outline consent, which comprised 7,063sq.m of industrial use. However, the proposed NHS development only takes a portion of the wider site and will replace 7,063sq.m of the existing industrial consent.

The nearest receptors to the proposed site are the residential properties to the south on Thornely Avenue and Highams Lane as well as Lane Head Farm adjacent to the northern boundary of the site.

1.2 Summary of the Outline Air Quality Assessment

The air quality assessment for the outline planning application, that covered all of Capitol Park, concluded:

- The annual mean background pollutant concentrations at the proposal site were well below the annual mean objectives for both NO₂ and PM₁₀.
- Annual mean NO₂ impacts described as Moderate Adverse were predicted at one modelled receptor on Dodworth Road, adjacent to Junction 37. This was due to the magnitude of change in concentration at this receptor associated with the proposed development, and also concentrations in excess of the annual mean objective due to the proximity to the M1. However, the predicted change in pollutant concentration was very close to being described as negligible, and based on nearby monitoring results it is considered likely that the model approach has resulted in an overestimation of concentrations at this location.
- Furthermore, the model approach was cautious, and it was assumed that background pollutant concentrations and exhaust emission rates would not change between 2015 to 2021, although it is likely to actually decrease over time.
- Therefore, the overall impact to annual mean NO₂ were considered to be not significant.
- Negligible impacts were predicted at all receptors with regards to the 1-hour NO₂ objective, the annual mean PM₁₀ objective, the daily mean PM₁₀ objective and the annual mean PM_{2.5} objective in all modelled scenarios.

The receptors expected to be most adversely affected by the proposed scheme were the 1-2 properties closest to the motorway. The predicted impacts were related to the high baseline pollutant concentrations in this area, which may continue to exceed the annual mean objective with, or without, the proposed scheme going ahead.

Therefore, it was recognised that the mitigation controls may need to be implemented by the site operators through management and policy with regard to the Barnsley MBC Air Quality and Emissions Good Practice Planning Guidance.

2. Proposed Unit D Traffic Flows

The proposed use of the land for the NHS (Unit D) was predicted to lead to a relative change in the number of vehicle movements compared to the approved scenario for the total Capitol Park development, and which were used in the air quality assessment in June 2016.

The proposed NHS development would lead to a relatively greater number of car movements, but negligible HGV movements. The outline application used traffic flow data based on the general land use and applied a nominal 10% HGV component.

Table 1 presents the traffic flows that were approved for the original outline application, and the subsequent changes associated with the proposed scheme, as follows:

- The approved development trips for the entire site was calculated for B1/B2/B8 uses and a potential development area of 16,499 m²;
- The predicted development trips were adjusted to account for the change of land use for the NHS element, which represented a reduction in development area by 6,503 m²;
- The traffic flow associated with the proposed NHS development was predicted to contribute additional car trips, but negligible HGV movements.

The number of vehicles associated with the approved land use and the proposed NHS development are provided in Table 1.

Table 1. Proposed Change in Traffic Flow

Scenario	Total Capitol Park AADT	HGV	
		%	AADT
Permitted Scenario	884	10%	88
Including Proposed NHS Site	1036	4.8%	50
Change Compared to Permitted	152	-5.2%	-38

2.1 Screening Assessment

The change in total vehicles exceeds the assessment threshold criteria recommended by the IAQM/EPUK (2017) planning and development guidance, whereby an increase of 100 AADT within or adjacent to an AQMA.

Therefore, a screening assessment was undertaken whereby the change in traffic flow was input to the Emission Factor Toolkit (EFT, v7.0) to indicate the change in emissions resultant from the proposed NHS scheme compared to the approved scenario.

The emissions model inputs are provided in Table 2.

Table 2. EFT Model Parameters

Model Parameter	Value
Area	England (not London)
Year	2016 - 2022
Traffic Format	Basic Split
Road Type	Urban (not London)
Speed(kph)	48
No of Hours	24
Link Length (km)	1

The results from the emissions model are provided in Table 3.

The results indicate that the change in traffic flow will result in lower NO_x emissions until approximately 2021, although after this time there may be slightly higher relative NO_x emissions. However, this would only be a 4% higher than the approved scheme.

The predicted slight increase in NO_x emissions in the future is dependent on the older components of the fleet being replaced by lower-emitting vehicles, to achieve significantly lower total emissions. However, it is broadly anticipated that these projections may be over optimistic, and so the 2016 scenario is likely to be more realistic.

The PM₁₀ emissions were predicted to be slightly higher in than the approved scenario, but would not increase beyond 2018 as changes to the fleet will not achieve notable reductions in primary (i.e. exhaust) particulate emissions.

Table 3. Predicted Annual NO_x and PM₁₀ Emissions

Scenario	Traffic Flow		Pollutant	Annual Emissions, kg/yr			
	AADT	HGV%		2016	2018	2020	2022
Approved Traffic	884	10%	NO _x	166.6	126.1	96.7	76.4
			PM ₁₀	14.6	13.8	13.3	13.0
Proposed Traffic	1036	4.8%	NO _x	152.4	119.9	96.2	79.2
			PM ₁₀	14.8	14.2	13.7	13.4
Change	152	-5.2%	NO _x	-14.2	-6.2	-0.5	2.8
			PM ₁₀	0.2	0.4	0.4	0.4

3. Summary and Conclusions

AECOM were appointed to assess the proposed local air quality effects results from the proposed Capitol Park development as part of an outline application. The assessment used traffic flow values derived from the proposed land use and area. The outline application was granted.

This assessment has reviewed the relative changes in traffic flow associated with the detailed planning application for the site for use by the NHS Blood Service.

The changes in traffic flow were summarised, and the effects were:

- Increase AADT by 152, from the approved flow of 884 up to 1036; and,
- Decrease in HGV flow from 88 to 50, as the proposed scheme will have a negligible HGV component compared to the approved scheme.

The increase in total traffic flow exceeds the threshold recommended by IAQM to trigger an air quality assessment. However, due to the reduction in HGV flows, it was anticipated that the change in emissions compared to the approved scheme would not be significant.

A screening assessment was undertaken to appraise the change in emissions resultant from the proposed scheme, compared to the approved scenario:

- NO_x emissions were predicted to be lower than the approved scheme in 2016;
- PM₁₀ emissions were predicted to be slightly higher than the approved scheme in all years;
- NO_x emissions were predicted to be higher than the approved scheme in 2022;

Therefore, it was expected that the change in traffic flow compared to the approved scheme would not lead to significant detrimental local air quality effects, at receptors in the vicinity, compared to the approved scheme.

