

Air Quality Assessment
Oak Street, Cheadle

Client: AG Housing and Building Services Limited

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Report Issue

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Executive Summary

Redmore Environmental Ltd was instructed by AG Housing and Building Services Limited to undertake an Air Quality Assessment in support of a Discharge of Condition application for a residential development on land off Oak Street, Cheadle.

Planning consent for the scheme was granted by Staffordshire Moorlands District Council in August 2021, subject to a number of conditions. These included the requirement for an Air Quality Assessment in order to determine baseline conditions at the site, consider the potential for development users to be exposed to external air pollution and define any requirement for a mitigation scheme

The development may lead to the exposure of future residents to elevated pollution levels. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions at the development and consider site suitability for the proposed end-use.

The potential for exposure of future residents to poor air quality was assessed based on the results of a desk top study. This indicated that pollutant concentrations are likely to be below the relevant criteria at the development location. As such, the site is considered suitable for the proposed end use from an air quality perspective.

Based on the assessment results, air quality issues are not considered a constraint to planning consent for the proposals.

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1.0 INTRODUCTION

1.1 Background

- 1.1.1 Redmore Environmental Ltd was instructed by AG Housing and Building Services Limited to undertake an Air Quality Assessment in support of a Discharge of Condition application for a residential development on land off Oak Street, Cheadle.
- 1.1.2 The Planning Condition requires the developer to consider the potential for future users to be exposed to external air pollution and define any requirement for a mitigation scheme. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions at the site and identify any requirement for control measures.

1.2 Site Location and Context

- 1.2.1 The site is located at Mill House, Oak Street, Cheadle at approximate National Grid Reference (NGR): 400762, 343198. Reference should be made to Figure 1 for a map of the site and surrounding area.
- 1.2.2 The proposals comprise the conversion of an existing store/workshop building to two residential dwellings.
- 1.2.3 Planning consent for the scheme was granted by Staffordshire Moorlands District Council (SMDC) on the 2nd August 2021 subject to a number of conditions. These include the following in relation to air quality:

"11. Prior to the commencement of development an air quality assessment shall be carried out for the proposed development and a scheme for protecting the future residential occupiers of the buildings from the effects of nitrogen dioxide arising from road traffic has been submitted to and approved in writing by the local planning authority. All works which form part of the approved scheme shall be completed prior to the occupation of the buildings hereby approved and thereafter maintained for the lifetime of the development.

Reason: In order to safeguard the amenities of the occupiers of the proposed dwelling[s] in respect of atmospheric pollution."

1.2.4 An Air Quality Assessment has therefore been undertaken to address the above condition. This is detailed within the following report.

2.0 LEGISLATION AND POLICY

2.1 Legislation

2.1.1 The Air Quality Standards Regulations (2010) came into force on 11th June 2010 and include Air Quality Limit Values (AQLVs) for the following pollutants:

- Nitrogen dioxide (NO₂);
- Sulphur dioxide;
- Lead;
- Particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀);
- Particulate matter with an aerodynamic diameter of less than 2.5µm;
- Benzene; and,
- Carbon monoxide.

2.1.2 Air quality target values have also been provided for several additional pollutants.

2.1.3 Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007¹. The AQS sets out AQOs that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

2.1.4 Table 1 presents the AQOs for pollutants considered within this assessment.

Table 1 Air Quality Objectives

Pollutant	Air Quality Objective	
	Concentration (µg/m ³)	Averaging Period
NO ₂	40	Annual mean

¹ The AQS for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.

Pollutant	Air Quality Objective	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
PM ₁₀	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum

2.1.5 Table 2 summarises the advice provided in DEFRA guidance² on where the AQOs for pollutants considered within this report apply.

Table 2 Examples of Where the Air Quality Objectives Apply

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
Annual mean	All locations where members of the public might be regularly exposed Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean	All locations where the annual mean objective would apply, together with hotels Gardens of residential properties	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

² Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

2.2 Local Air Quality Management

2.2.1 Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure, as summarised in Table 2, are likely to be exceeded, the LA is required to declare an AQMA. For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.3 National Planning Policy

2.3.1 The revised National Planning Policy Framework³ (NPPF) was published in July 2021 and sets out the Government's planning policies for England and how these are expected to be applied.

2.3.2 The purpose of the planning system is to contribute to the achievements of sustainable development. In order to ensure this, the NPPF recognises three overarching objectives including the following of relevance to air quality:

"c) An environmental objective - to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

2.3.3 Chapter 15 of the NPPF details objectives in relation to conserving and enhancing the natural environment. It states that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

[...]

³ NPPF, Ministry of Housing, Communities and Local Government, 2021.

e) preventing new and existing development from contributing to, or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality [...]"

2.3.4 The NPPF specifically recognises air quality as part of delivering sustainable development and states that:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

2.3.5 The implications of the NPPF have been considered throughout this assessment.

2.4 **National Planning Practice Guidance**

2.4.1 The National Planning Practice Guidance⁴ (NPPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 and updated on 1st November 2019 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

1. What air quality considerations does planning need to address?
2. What is the role of plan-making with regard to air quality?
3. Are air quality concerns relevant to neighbourhood planning?
4. What information is available about air quality?

⁴ <https://www.gov.uk/guidance/air-quality--3>.

5. When could air quality considerations be relevant to the development management process?
6. What specific issues may need to be considered when assessing air quality impacts?
7. How detailed does an air quality assessment need to be?
8. How can an impact on air quality be mitigated?

2.4.2 These were reviewed and the relevant guidance considered as necessary throughout the undertaking of this assessment.

2.5 Local Planning Policy

2.5.1 The Staffordshire Moorlands Local Plan⁵ was adopted by SMDC in September 2020. Review of the document indicated the following policy of relevance to this assessment:

"Policy SD 4

Pollution and Water Quality

The Council will protect people and the environment from unsafe, unhealthy and polluted environments by ensuring proposals avoid potential adverse effects; and only permitting proposals that are deemed (individually or cumulatively) to result in pollution (including air/ water/ noise/ vibration/ light/ ground contamination) if after mitigation, potential adverse effects are deemed acceptable. This may be achieved by the imposition of planning conditions or through a planning obligation.

[...]."

2.5.2 The above policy was taken into consideration throughout the undertaking of this assessment.

⁵ Staffordshire Moorlands Local Plan, SMDC, 2020.

3.0 **BASELINE**

3.1 **Introduction**

- 3.1.1 Existing air quality conditions in the vicinity of the proposed development site were identified in order to provide a baseline for assessment. These are detailed in the following Sections.

3.2 **Local Air Quality Management**

- 3.2.1 As required by the Environment Act (1995), SMDC has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean NO₂ concentrations are above the AQO within the district. As such, two AQMA's have been declared. The closest of these to the site is the No.2: Cellarhead AQMA, which is described as follows:

"The area shown on the attached map in red is the designated area. The area encompasses the area known locally as the Cellarhead crossroads, which is a busy junction between the A52 and the A520. The AQMA extends 250m (A520) North, 230m South (A520), 480m East (A52) and 210m West (A52) of the junction."

- 3.2.2 The development is located approximately 6.6km south-east of the AQMA. It is considered unlikely that the proposals will cause air quality impacts over a distance of this magnitude. As such, the AQMA has not been considered further in the context of the assessment.
- 3.2.3 SMDC has concluded that concentrations of all other pollutants considered within the AQs are currently below the relevant AQOs. As such, no further AQMA's have been designated.

3.3 **Air Quality Monitoring**

- 3.3.1 Monitoring of pollutant concentrations is undertaken by SMDC throughout their area of jurisdiction. Recent NO₂ concentrations recorded in the vicinity of the development are shown in Table 3. Exceedences of the relevant AQO are shown in **bold**.

Table 3 Monitoring Results

Monitoring Site		Monitored NO ₂ Concentration (µg/m ³)		
		2017	2018	2019
7	Cheadle (Leek Road Rbt Central)	35.2	38.0	36.2
14	Cheadle (Tape Street)	30.6	32.0	26.6
29	Cheadle (Leek Road Rbt North)	33.1	36.9	39.7
30	Cheadle (Leek Road Rbt South)	33.8	33.5	35.5
45	Cheadle Roundabout (Special)	33.2	34.5	35.3
50	Cheadle (Tape St Eastbound) ^(a)	-	28.6	22.7
51	Cheadle (Tape St Westbound) ^(a)	-	24.6	30.2
52	Cheadle (Tape St Westbound 2) ^(a)	-	37.1	40.1

Note: (a) Monitor commissioned in 2018.

3.3.2 As shown in Table 3, annual mean NO₂ concentrations were above the AQO at the 52 - Cheadle (Tape St Westbound 2) monitor in 2019. As the site is positioned at a roadside location, adjacent to the A522, elevated levels are to be expected. Concentrations were below the AQO at the remaining locations in recent years. Reference should be made to Figure 2 for a map of the survey positions.

3.3.3 SMDC do not undertake monitoring of PM₁₀ concentrations within the vicinity of the site.

3.4 Background Pollutant Concentrations

3.4.1 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located in grid square NGR: 400500, 343500. Data for this location was downloaded from the DEFRA website⁶ for the purpose of the assessment and is summarised in Table 4.

⁶ <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>.

Table 4 Background Pollutant Concentration Predictions

Pollutant	Predicted 2021 Background Pollutant Concentration ($\mu\text{g}/\text{m}^3$)
NO ₂	8.80
PM ₁₀	10.37

3.4.2 As shown in Table 4, predicted background NO₂ and PM₁₀ concentrations are well below the relevant AQOs at the development site.

4.0 METHODOLOGY

4.1.1 The proposed development comprises residential land use. This is considered a location of relevant exposure for long and short term AQOs in accordance with the criteria provided within DEFRA guidance⁷, as summarised in Table 2. Existing air quality conditions at the site were therefore assessed through consideration of the following factors:

- AQMA designations;
- Proximity to significant pollution sources;
- Local monitoring results; and,
- Background pollutant concentration predictions.

4.1.2 The findings were subsequently used to determine the potential for exceedences of the relevant AQOs at the development location. Should the assessment indicate significant uncertainty over air quality conditions at the site then further quantitative methods, such as detailed dispersion modelling, could be utilised to refine predictions.

⁷ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

5.0 **ASSESSMENT**

5.1 **Introduction**

5.1.1 The proposed scheme comprises residential land use and therefore may introduce new receptors into an area of poor air quality. As such, existing conditions at the site are considered in the following Sections.

5.2 **AQMA Designation**

5.2.1 The site is located approximately 6.6km south-east of the No.2: Cellarhead AQMA which has been declared due to exceedences of the annual mean AQO for NO₂. The designation does not cover 1-hour NO₂, 24-hour or annual mean PM₁₀, indicating exceedences of these AQOs have not been identified within SMDC's administrative extents. As such, they have not been considered further in the context of this assessment.

5.2.2 As the site is located within a residential area it would be anticipated that there would be a need for an AQMA to cover nearby housing if exceedences of the AQOs had been recorded or predicted locally. As this is not the case, it is considered that exceedences of the AQOs are unlikely to occur at the proposed development.

5.3 **Proximity to Significant Pollution Sources**

5.3.1 A desk-top study was undertaken in order to identify any significant pollution sources within the vicinity of the site. The findings are provided in Table 5.

Table 5 Significant Pollution Sources

Source	Distance to Site (m)	Comment
A521 - Bank Street	Adjacent	Bank Street is a classified A-road with an AADT flow of 5,582 and Heavy Duty Vehicle (HDV) proportion of fleet of 2.41% during 2020 ⁸ . The section of Bank Street adjacent to the site, and to the west and north of the scheme, is a one-way street

⁸ Department for Transport, <https://roadtraffic.dft.gov.uk/basemap-countpoints>

Source	Distance to Site (m)	Comment
		Review of Google Maps ⁹ software indicated that congestion levels are low along Bank Street and traffic is free flowing throughout the day
A522 - Tape Street	240	Tape Street is a classified A-road with an AADT flow of 9,850 and HDV proportion of fleet of 4.72% during 2020¹⁰ Review of Google Maps¹¹ software indicated that congestion levels are moderate along Tape Street with some congestion during peak hours

5.3.2 As shown in Table 5, there are two pollutant sources within the vicinity of the site. The A521 experiences relatively low levels of traffic throughout the day due to one-way nature of the network. In addition, congestion levels are low and traffic is able to move freely throughout the day. The A522 is distanced from the boundary of the site. As such, these sources are unlikely to contribute significantly to pollution levels above background.

5.4 **Local Monitoring Results**

5.4.1 There are a number of monitoring sites located in the vicinity of the development. As shown in Table 3, levels recorded at the majority of positions were below the relevant AQO in recent years.

5.4.2 It is noted that concentrations recorded at the 52 - Cheadle (Tape St Westbound 2) monitor were slightly above the AQO during 2019. As the monitor is located adjacent to the A522, one of the primary two-way routes leading out of Cheadle that experiences moderate levels of congestion, conditions are not considered to be representative of those at the proposed site, which is adjacent to an uncongested one way road.

5.4.3 Based on the above, exceedences of the relevant AQO are considered unlikely at the development location.

5.5 **Background pollutant concentrations**

⁹ <https://www.google.com/maps>

¹⁰ Department for Transport, <https://roadtraffic.dft.gov.uk/basemap-countpoints>

¹¹ <https://www.google.com/maps>

5.3.9 As shown in Table 4, predicted background pollutant concentrations for the site were well below the annual mean AQOs for NO₂ and PM₁₀ during 2021.

5.3.10 Based on the predicted background concentrations, exceedences of the relevant AQOs are considered unlikely at the development location.

5.6 Summary

5.6.1 It is considered likely that pollutant concentrations are below the relevant AQOs at the proposed development site for the following reasons:

- The site is not located within an AQMA;
- The site is distanced from major pollution sources;
- Local monitoring results indicated annual mean NO₂ concentrations are below the relevant AQO; and,
- Predicted background pollutant concentrations are well below the relevant AQOs.

5.6.2 Based on the assessment results, exposure of future residents to the exceedences of the AQOs is not considered likely. As such, the site is considered suitable for the proposed end-use from an air quality perspective, without the requirement for mitigation measures.

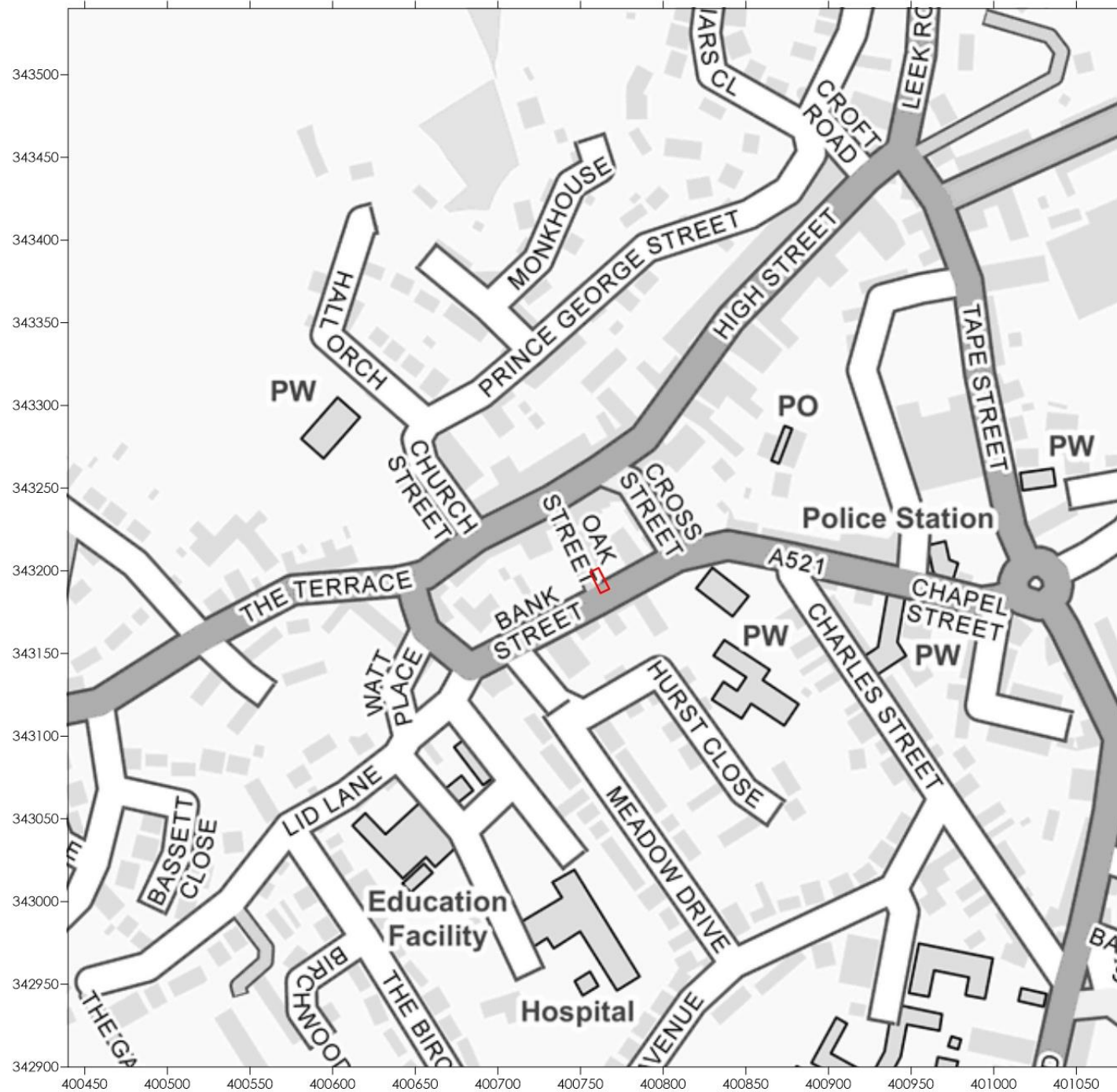
6.0 CONCLUSION

- 6.1.1 Redmore Environmental Ltd was instructed by AG Housing and Building Services Limited to undertake an Air Quality Assessment in support of a Discharge of Condition application for a residential development on land off Oak Street, Cheadle.
- 6.1.2 Planning consent for the scheme was granted by SMDC in August 2021, subject to a number of conditions. These included the requirement for an Air Quality Assessment in order to determine baseline conditions at the site, consider the potential for development users to be exposed to external air pollution and define any requirement for a mitigation scheme.
- 6.1.2 The development may lead to the exposure of future residents to elevated pollution levels. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions at the development and consider site suitability for the proposed end-use.
- 6.1.3 The potential for exposure of future residents to exceedences of the AQOs was assessed based on local AQMA designations, proximity to significant pollution sources, local monitoring results and predicted background concentrations. This indicated that concentrations of NO₂ and PM₁₀ are likely to be below the relevant AQOs at the development location. As such, the site is considered suitable for the proposed use from an air quality perspective, without the requirement for mitigation measures.
- 6.1.4 Based on the assessment results, air quality issues are not considered a constraint to planning consent for the development.

7.0 **ABBREVIATIONS**

AQAP	Air Quality Action Plan
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
DEFRA	Department for Environment, Food and Rural Affairs
HDV	Heavy Duty Vehicle
LA	Local Authority
LAQM	Local Air Quality Management
NGR	National Grid Reference
NO ₂	Nitrogen dioxide
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10µm
SMDC	Staffordshire Moorlands District Council

Figures



Legend



Site Boundary

Title

Figure 1 - Site Location Plan

Project

Air Quality Assessment
Oak Street, Cheadle

Project Reference

4851

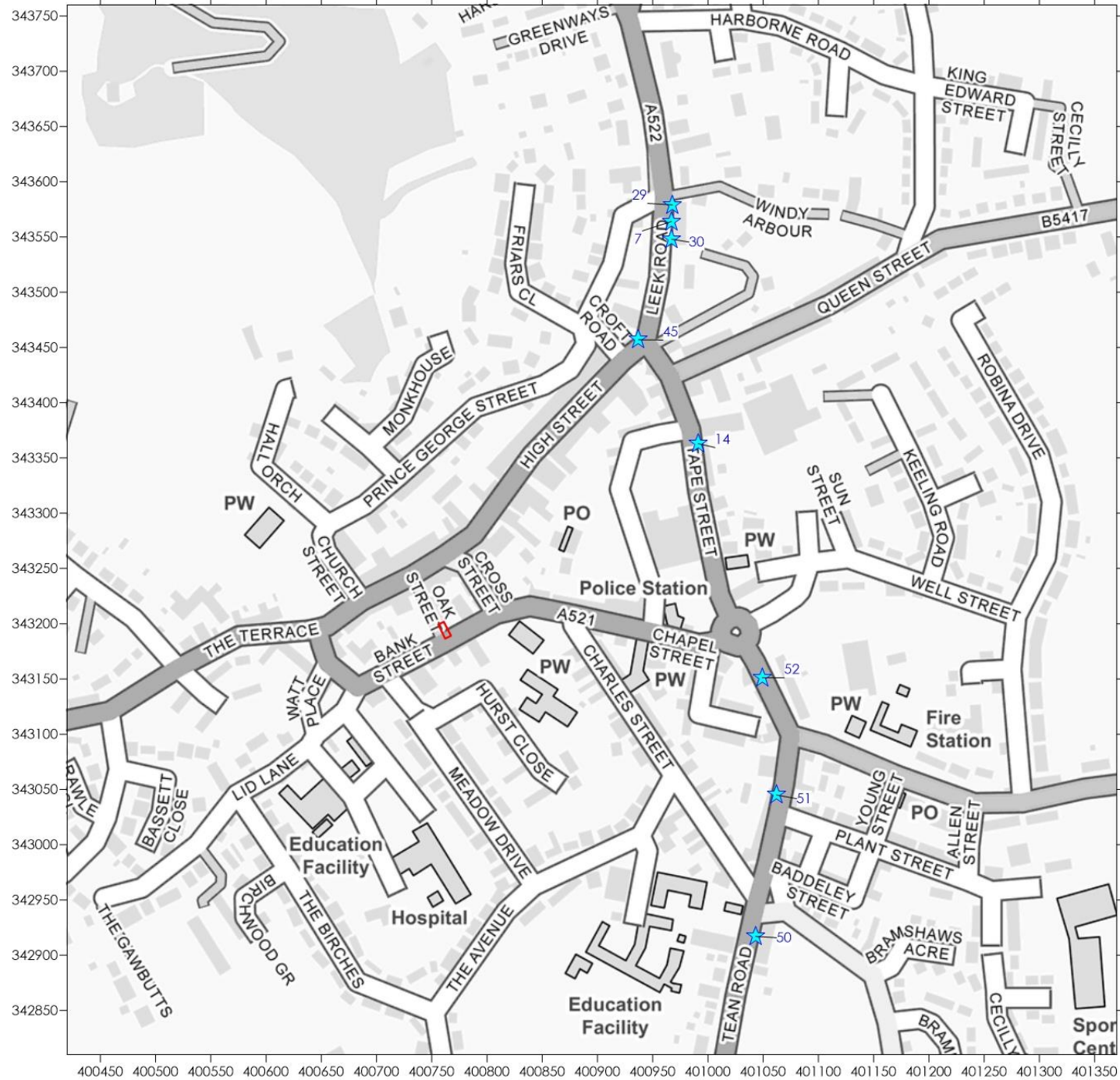
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Legend



Site Boundary



Monitor

Title

Figure 2 - Monitoring Locations

Project

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