

St Modwen Properties Plc

**Habitats Regulations Assessment:
Stage 2- Appropriate Assessment**

**Land to the West of Pye Green
Road, Hednesford**

December 2010

St Modwen Properties Plc

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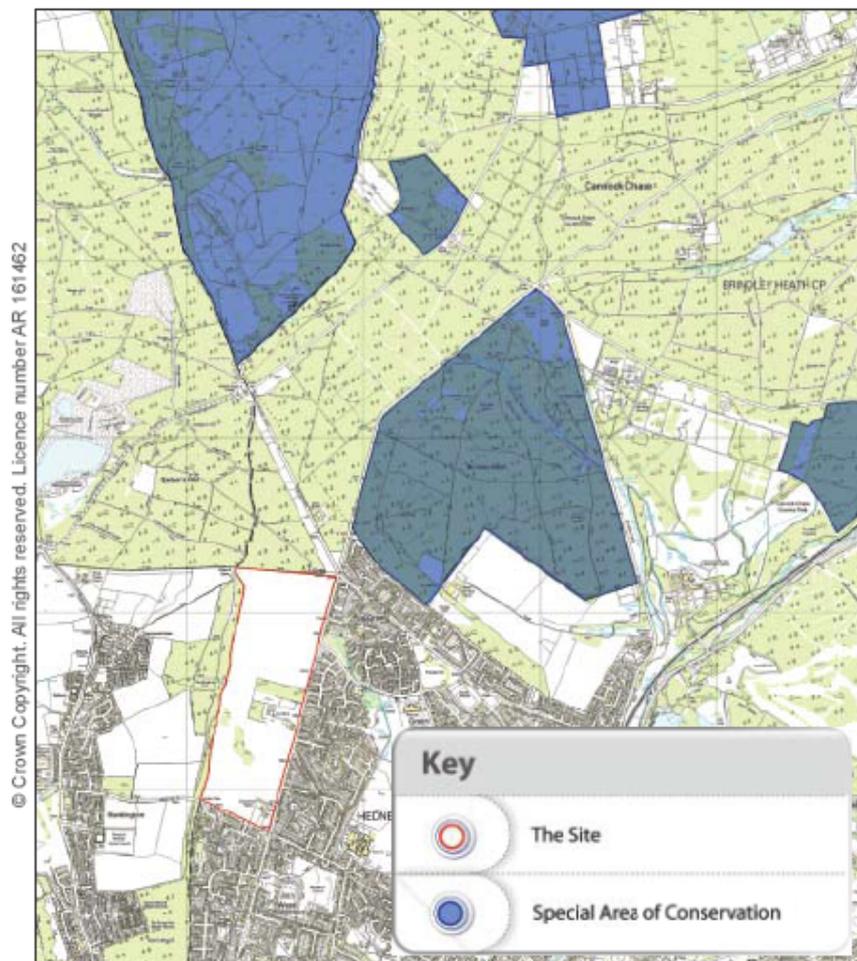
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1. Introduction

- 1.1 This report forms Stage 2 of the Habitats Regulations Assessment process (Appropriate Assessment) for the potential development of 750 houses on the land to the west of Pye Green Road, Hednesford). The Stage 2 – Appropriate Assessment has been completed in relation to Cannock Chase Special Area of Conservation (SAC).
- 1.2 Cannock Chase District Council (the Council) has prepared a *Development Brief for the Land to the West of Pye Green Road, Hednesford* for public consultation purposes. The site has been identified for development in the District Council's emerging Core Strategy as a strategic allocation and when adopted, the Development Brief will assist and guide the shape of any development on the site. This Stage 2 - Appropriate Assessment has therefore been prepared to accompany the *Development Brief* and can also be used as supporting information for an eventual planning application to be submitted by a developer.
- 1.3 Cannock Chase SAC is approximately 230 m north-east of the proposed development. The boundary of the potential development site and its location in relation to Cannock Chase SAC is shown on Figure 1.1 below.

Figure 1.1: Cannock Chase SAC in relation to potential development site



1.1 The Development Brief

- 1.4 The *Land to the west of Pye Green Road, Hednesford Development Brief* provides guidance for the site's development for housing (a total of 750 houses) supported by new educational provision (a primary school), community facilities (a local centre) and open space. The site is approximately 66 ha in size.
- 1.5 Any potential development of the site will be required to provide for the needs of its new community through planning the facilities necessary for the residents to have opportunities and choices and a good quality of life. Access to a range of appropriate services and facilities in a Local Centre will help build a sense of community cohesion and integration with existing communities to the east and south of the proposed development. The planning application process will determine exactly what is to be provided within the Local Centre and the following options are identified in the brief:
- Doctor's Surgery;
 - Dentist;
 - Pharmacist;
 - Community Centre/Hall;
 - Place of Worship;
 - Pre-School Nursery (potentially linked to the primary school);
 - Local retail provision (such as a convenience store/hairdressers/post office) (A1 use);
 - Local Estate Agent/Betting Office (A2 Use);
 - Cafe/public house/takeaway (A3, A4, A5 Use); and,
 - Ancillary developments including car parking, cycle storage, CCTV, live/work units and a recycling facility.
- 1.6 The *Development Brief* provides guidance for the development of the site. This *Development Brief* seeks to establish a design strategy for the site and describes the opportunity to create a high quality environment which is sympathetic to its hinterlands within the Cannock area and creates an attractive environment where people will want to live, work and relax. The *Development Brief* does not set out the exact details of the development, it merely acts as a guide as to how the development will be delivered. However, it does provide a firm basis for the establishment of imaginative proposals and ideas for how the site can be an exemplar development for the Cannock area.
- 1.7 The *Development Brief* provides guidance to landowners, developers and residents alike about expectations with respect to the layout, form and quality. The *Development Brief* also identifies development constraints and opportunities; describes how a high standard of design and layout (relating to new housing, educational and community infrastructure provision and open space) can be achieved; and how integration with the wider environment will be achieved. The following issues are considered in the *Development Brief*:
- Landscape and visual;
 - Ecology and nature conservation;
 - Flood risk and drainage;
 - Transport;
 - Environmental sustainability and climate change;
 - Design.

1.2 Background to Habitats Regulations Assessment (HRA)

- 1.8 A Habitats Regulation Assessment (HRA) is required by Regulation 21 the Conservation of Habitats and Species 2010 (the Habitats Regulations) for all plans and projects which may impact on a European site and/or its interest features. HRA must be completed by the Competent Authority (in this case Cannock Chase Council).
- 1.9 European sites include Special Areas of Conservation (SAC) and Special Protection Areas (SPA). In this case, the European site is Cannock Chase SAC which is in proximity to the proposed development (see Section 1.3 below).
- 1.10 An HRA is also required, as a matter of UK Government policy for potential SPAs (pSPA), candidate SACs (cSAC) and listed Wetlands of International Importance (Ramsar sites) for the purposes of considering plans and projects, which may affect them¹. In this case, these designations are not involved in the HRA process. All of the above designated nature conservation sites are referred to as ‘international sites’ in the following brief descriptions of the stages of the HRA process:
- **Stage 1 – Screening:** To test whether a plan or project either alone or in combination with other plans and projects is likely to have a significant effect on an international site. If it cannot be concluded that there will be no likely significant effect on any international site, Stage 2 is needed;
 - **Stage 2 – Appropriate Assessment:** To determine whether, in view of an international site’s conservation objectives, the plan (either alone or in combination with other projects and plans) would have an adverse effect (or risk of this) on the integrity of the site with respect to the site structure, function and conservation objectives. If adverse impacts are anticipated, potential mitigation measures to alleviate impacts should be proposed and assessed;
 - **Stage 3 – Assessment of alternative solutions:** Where a plan is assessed as having an adverse impact (or risk of this) on the integrity of an international site, there should be an examination of alternatives (e.g. alternative locations and designs of development); and
 - **Stage 4 – Assessment where no alternative solutions remain and where adverse impacts remain:** In exceptional circumstance (e.g. where there are imperative reasons of overriding public interest), compensatory measures to be put in place to offset negative impacts.
- 1.11 Stage 2 of the Habitats Regulations Assessment process (Appropriate Assessment) has been undertaken in respect of the proposed development and Cannock Chase SAC.

1.3 Previous HRA Work

- 1.12 The Council is aware that the Developer completed Stage 1 of the Habitats Regulations Assessment process (Screening) in May 2008². The HRA Screening identified three likely significant effects on one international site, Cannock Chase SAC:
- **Increased recreational use of the SAC.** Given the close proximity of the development site to the SAC, it was concluded that there may be a large number of regular and casual users visiting the site from the proposed development. This would in turn lead to a potential decrease in habitat area, habitat fragmentation, disturbance to key species and changes to soil chemistry (due a potential increase in dog fouling);

¹ *Planning Policy Statement 9: Biodiversity and Geological Conservation*, ODPM (August 2005)

² *Land to the West of Pye Green Road, Cannock: Appropriate Assessment Screening* (Atkins Limited, May 2008)

- **A potential change in air quality.** There may be an increase in the number of cars accessing the proposed housing development and the surrounding area. It was concluded that there may be an increase in nitrogen deposition and acid deposition on the lowland heathland habitats within the SAC; and
 - **A potential increase in water abstraction.** There may be an increased water demand leading to a possibility of an increase in water abstraction from the local Public Water Supply. It was concluded that this may lead to possible impacts on the wetland habitats within the SAC.
- 1.13 At the screening stage it was not possible to determine if the three issues outlined above would not lead to significant effects on Cannock Chase SAC. As such the precautionary principle enshrined with the Habitat Regulations was employed and the next stage of the HRA process, Stage 2 - Appropriate Assessment, was recommended to be carried out.
- 1.14 The Council is also aware that the Developer completed a Stage 2 – Appropriate Assessment in March 2009³. This assessment determined that, with mitigation, there would be no adverse effect on integrity of Cannock Chase SAC.
- 1.15 However, since the time that the Stage 2 – Appropriate Assessment report was produced the details of the proposed development have altered. The March 2009 report was produced on the basis that 600 houses were to be constructed at the site as a proposed first phase of the site's development. As outlined in Section 1.1 above, a total of 750 houses will now be provided at the site as well as community facilities (including an education provision). It has therefore been necessary to update the Stage 2 report to ensure that there is no change in findings in relation to effects of the site on the integrity of Cannock Chase SAC.
- 1.16 This report forms the updated Stage 2 – Appropriate Assessment. It assesses both the *Development Brief* and the construction of 750 houses and associated community facilities that are proposed at the site (in order to support the planning application which will be submitted in early 2011). The purpose of this report is to determine whether the proposed development will lead to adverse effects on the integrity of Cannock Chase SAC (during construction and operation) and to identify any mitigation required to reduce any adverse effects to an insignificant level. A detailed assessment of recreational impacts, air quality impacts and water abstraction impacts has been completed for this assessment.

1.4 Outline of this Report

- 1.17 Following this introduction:
- Section 2 sets out the relevant information about the Cannock Chase SAC;
 - Section 3 outlines the approach taken to the Stage 2 – Appropriate Assessment;
 - Section 4 details the organisations contacted for details on other plans and projects which have the potential for adverse effects upon the international sites (to allow an assessment of in combination effects);
 - Section 5 sets out the assessment of the effects of potential increased recreational pressure on the SAC;
 - Section 6 sets out the assessment of the potential for decreased air quality on the SAC;
 - Section 7 sets out the findings of the assessment of the potential for increased water abstraction on the SAC; and

³ *Information for Habitats Regulations Assessment: Proposed Phase 1 Development on Land West of Pye Green Road, Cannock* (Atkins Limited, March 2009)

- Section 8 provides the conclusions of the Stage 2 – Appropriate Assessment.

2. Information about Cannock Chase Special Area of Conservation

Site Designation Status	Cannock Chase Special Area of Conservation
Distance and direction from plan boundary to the International site	<p>The Cannock Chase SAC is located in Staffordshire, to the north of Cannock.</p> <p>The proposed development is located to the west of Pye Green Road, near Brindley Heath in Cannock. The location and boundary of the development site is shown on Figure 1.1 above. The proposed development is located, at its closest point, approximately 230 m south-west of the international site.</p>
Brief Description of the International Site	<p>The area of lowland heath that forms Cannock Chase SAC is the most extensive in the Midlands. The character is intermediate between the upland or northern heaths of England and Wales and those of southern counties. The dry heath communities present belong to National Vegetation Classification types H8 (<i>Calluna vulgaris</i> - <i>Ulex gallii</i>) and H9 (<i>Calluna vulgaris</i> – <i>Deschampsia flexuosa</i>) heaths (<i>British Plant Communities Volume 2: Mires and Heaths</i>, J.S. Rodwell, 1998). These habitats are the primary reason for the selection of the site.</p> <p>Cannock Chase has the main British population of hybrid bilberry (<i>Vaccinium x intermedium</i>), a plant of restricted occurrence. There are also important populations of butterflies and beetles, as well as European nightjar and five species of bats.</p> <p>Also present are northern Atlantic wet heaths with cross leafed heath (<i>Erica tetralix</i>). This habitat is a qualifying feature of the SAC but is not the primary reason for the selection of this site.</p>
Conservation Objectives of the International Site	<p>The Conservation Objectives⁴ for Cannock Chase SAC are (subject to natural change) to maintain the following habitats in favourable condition:</p> <ul style="list-style-type: none"> • Dwarf shrub heath; • Broadleaved mixed and yew woodland; and • Fen, marsh and swamp. <p>Particular reference should also be paid to any dependent component</p>

⁴ Conservation Objectives: Cannock Chase SSSI (Staffordshire), Consultation Draft (25th March 08 07)

	<p>special interest features (i.e. habitats, vegetation types, species, species assemblages etc.) for which the land is designated.</p> <p>Further details are available in the site citation (www.jncc.gov.uk, www.naturalengland.org.uk).</p>
Site Vulnerability / Issues	<p>The site is vulnerable for a number of reasons, including the threat of:</p> <ul style="list-style-type: none">• track creation and vegetation damage from visitor activity (Cannock Chase is popular and well used as a Country Park). This includes dog walking, horse riding, mountain biking, off-track activities (i.e. orienteering and car parking);• loss of heathland to fragmentation and scrub/woodland encroachment;• invasion of plant species (including bracken invasion and birch and pine scrub);• air pollution and acid deposition (the former may include nitrogen deposition and ozone resulting in potential impacts on heathlands and the latter may have implications for catchment water quality);• a major increase in water abstracted for public and industrial uses from the Sherwood Sandstone aquifer that underlies the European site (this may lead to effects on the wetland features within the SAC);• not being able to re-introduce sustainable management (i.e. in the form of livestock grazing) as the land is registered as Common Land. This poses a threat to the site as the Secretary of State must give approval before fencing can take place, meaning there may be problems obtaining this permission; and• hydrology of the site as, although mining in the area has now ended, the SAC overlies coal measures which have been deep mined, resulting in fissures across the site.

2.1 Documents that have been reviewed for additional information on this site and to help inform the Stage 2 – Appropriate Assessment include:

- *Cannock Chase Area of Outstanding Natural Beauty: Management Plan 2009-14* (Final Draft, Cannock Chase AONB Unit, 2009);
- *Cannock Chase AONB Visitor Survey 2000*; (Cannock Chase Area of Outstanding Beauty (AONB) Unit);
- *The West Midlands Regional Planning Body Habitats Regulations Assessment of the Phase II Revision of the Regional Spatial Strategy for the West Midlands* (October 2007);
- *Evidence Base relating to Cannock Chase SAC and the Appropriate Assessment of Local Authority Core Strategies* (Footprint Ecology, November 2009); and,
- *Cannock Chase Visitor Impact Mitigation Strategy* (Footprint Ecology, March 2010).

3. Approach

3.1 HRA is required for all plans and projects which may impact on an international site and/or its interest features (in accordance with the Habitats Regulations). Regulation 61 states:

1) A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which -

(a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects), and

(b) is not directly connected with or necessary to the management of that site,

must make an appropriate assessment of the implications for that site in view of that site's conservation objectives.

3.2 It also states that:

(5) In the light of the conclusions of the assessment, and subject to Regulation 62 (considerations of overriding public interest), the competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site or the European offshore marine site (as the case may be).

3.3 The assessment must determine whether the project, as proposed, would adversely affect the integrity of the site, in the light of its conservation objectives. For instance the conservation objectives for Cannock Chase SAC are to maintain, in favourable condition, the dwarf shrub heath, the broadleaved mixed and yew woodland and the fen, marsh and swamp⁵. If any plan or project causes the cited interest features of a site to fall into unfavourable condition they can be considered to have had a significant adverse effect upon the site's integrity.

3.4 The integrity of a site is defined as

"...the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified."⁶

3.5 Plans or projects can adversely affect the integrity of a site by:

- Causing delays in progress towards achieving the conservation objectives of the site;
- Interrupting progress towards achieving the conservation objectives of the site;
- Disrupting those factors that help to maintain the favourable conditions of the site; and
- Interfering with the balance, distribution and density of key species that are the indicators of the favourable condition of the site.

⁵ *Conservation Objectives: Cannock Chase SSSI (Staffordshire)*, Consultation Draft (25th March 08 07)

⁶ Part I, Section B, Paragraph 20 of Circular ODPM 06/2005 and Defra 01/2005 and accompanying Planning Policy Statement 9: Biodiversity and Geological Conservation.

- 3.6 Having regard to Natural England's advice, other consultation responses and any other information available, the Competent Authority (in this case Cannock Chase District Council) should decide whether the plan or project, as proposed, would adversely affect the integrity of the site, in the light of its conservation objectives.
- 3.7 The *Development Brief* and the construction and the operation of the proposed development site are not contributing to or required for the management of Cannock Chase SAC. As such an assessment of the *Development Brief* on the integrity of the Cannock Chase SAC, in light of its conservation objectives, is found in Sections 5, 6 and 7 below.
- 3.8 Natural England has produced a Favourable Conditions Table for Cannock Chase SAC⁴. This Stage 2 - Appropriate Assessment draws on the targets and objectives in this Favourable Conditions Table that relate to the conservation of species populations and the maintenance of the habitats within the international site and forms the basis of the assessment of potential effects upon the international site.
- 3.9 The Habitats Regulations Guidance Notes 1, 2 and 4 produced by Natural England have also been taken into account during this assessment (English Nature 1997, 2001).

4. Other Projects and Plans

4.1 The following organisations have been contacted for details on other plans and projects which have the potential for adverse effects, in combination with the proposed development, on Cannock Chase SAC:

- Cannock Chase Area of Outstanding Natural Beauty Unit (AONB Unit);
- Cannock Chase District Council;
- Environment Agency;*
- Forestry Commission;
- Lichfield District Council*;
- Natural England;
- Severn Trent Water;
- South Staffordshire Council;
- South Staffordshire Water;
- Stafford Borough Council;
- Staffordshire County Council; and
- Walsall Metropolitan Borough Council.

* No information received from these organisations to date (25/11/2010).

4.1 HRAs that have been Completed

4.2 The previous Stage 2 – Appropriate Assessment (completed in 2009) noted the following HRAs:

- Stafford Borough Council and Cannock Chase District Council had undertaken an Appropriate Assessment screening on the Stafford Borough and Cannock Chase Local Development Framework documents. These screening assessments concluded that the implementation of the Plans may lead to likely significant effects on the Cannock Chase SAC. Natural England has seen the screening assessments and agreed with this conclusion. A full Appropriate Assessment will therefore be completed on these documents.
- The AONB Unit completed an AA Screening of their final draft of the *Cannock Chase Area of Outstanding Natural Beauty: Management Plan 2009-14*. This Management Plan was found to have no likely significant effects on the Cannock Chase SAC.

4.3 The updated Stage 2 – Appropriate Assessment has noted four additional HRAs that have been completed:

- Walsall Metropolitan Borough Council – HRA Stage 1 Core Strategy of the Black Country Authorities Joint Core Strategy (produced in June 2010). The Stage 1 noted that it was not possible to conclude no likely significant effects on Cannock Chase SAC as a result of air quality and recreational disturbance. Stage 2 of the HRA process (Appropriate Assessment) is to be completed;

- The *Evidence Base relating to Cannock Chase SAC and the Appropriate Assessment of Local Authority Core Strategies* (Footprint Ecology, November 2009) reported on a detailed assessment of effects on Cannock Chase SAC based on the Core Strategies of the four local authority areas surrounding Cannock Chase SAC: Cannock Chase District Council, Lichfield District Council, South Staffordshire District Council and Stafford Borough Council.

The *Evidence Base relating to Cannock Chase SAC and the Appropriate Assessment of Local Authority Core Strategies* identified three issues likely to lead to significant effects on Cannock Chase SAC: increased water abstraction, deterioration in air quality, and an increase in recreational pressure. Due to the conclusions in the report a partnership has been set up to progress with further works. Members of the partnership include Staffordshire authorities, Black Country authorities, Natural England, the AONB Unit and the Forestry Commission. The partnership has commissioned an up to date visitor survey which has started and will be completed in 2011.

- Severn Trent Water (STW) has confirmed that the Review of Consents (RoC) Stage 4 carried out in March 2010 concluded the abstraction licences at Milford and Bednall could adversely impact the qualifying features of Cannock Chase SAC at fully licensed rates. STW are now working with the Environment Agency to ensure no adverse effect on site integrity (e.g. by limiting abstraction at these two points until STW are able to provide evidence of that abstraction at the fully licensed quantity does not lead to significant effects on Cannock Chase SAC). STW will be carrying out a pumping test at fully licensed rates in summer of 2011 (or before if possible).
- South Staffordshire Council – HRA Review of Policy Choices Document (August 2010). A review of the consultation draft of Core Policies and Development Policies was completed to see if they would be likely to have significant effects on international sites (including Cannock Chase SAC). Recommendations were made to highlight how the Draft Core Strategy should be structured to avoid significant effects on international sites. The HRA Review concluded that there would be no likely significant effects on Cannock Chase SAC providing the recommendations provided in the HRA Review were incorporated in the Draft Core Strategy. A Stage 1 – Screening is currently being undertaken of the Draft Core Strategy.

4.2 Future HRA Work

- 4.4 The air quality impact from existing traffic movements upon the SAC has been included in the air quality assessment as part of this Stage 2 – Appropriate Assessment. This has also involved an assessment of traffic movements from major sites which at the date of the HRA had planning permission (such as the Pye Green Valley Housing Development). This ensures that any in combination effects with surrounding development in relation to air quality are captured within the HRA accompanying the Development Brief.
- 4.5 However, in order to ensure that all in combination effects are taken into account in the HRA process for the land covered by the Development Brief, the Applicant will be required to produce an up-dated HRA to support the planning application. As part of this HRA it will be necessary to update the list of other projects and plans (in full consultation with the District Council), therefore capturing all likely in combination effects from major related developments.
- 4.6 The potential for additional traffic flows from the development to materially increase the level of collisions on the local deer population will need to be fully assessed within the future HRA and Environmental Impact Assessment process. This process will need to consider whether there are likely to be significant changes to the vegetation within the SAC as a result of collisions with the existing deer herds.

5. Assessment of Increased Recreational Pressure

5.1 Introduction

- 5.1 The Stage 1 - Screening report⁷ produced by Atkins in May 2008 highlighted that, given the close proximity of the development site to the SAC, it is possible that regular and casual users may visit the site from the new housing development.
- 5.2 A detailed assessment of the potential shifts in visitor demand driven by the proposed development of 600 houses and the effects on Cannock Chase SAC was carried out as part of the previous Stage 2 – Appropriate Assessment completed in March 2009. This involved providing an overview of the development site and the visitor trends at Cannock Chase SAC using visitor research undertaken for the wider Cannock Chase Area of Outstanding Natural Beauty (AONB)⁸, (which the SAC falls within), estimating the likely increase in residential population from the proposed development and using the information on visitor trends to estimate the most likely impact of the proposed development on visitor numbers to the SAC. This assessment concluded there would be no adverse effects on integrity provided mitigation measures were put in place.
- 5.3 This section of the current Stage 2 – Appropriate Assessment examines the potential changes to recreational use at Cannock Chase SAC based on the 750 houses and the associated community facilities (rather than the 600 houses alone). The *Evidence Base relating to Cannock Chase SAC and the Appropriate Assessment of Local Authority Core Strategies* (Footprint Ecology, November 2009) and the subsequent *Cannock Chase Visitor Impact Mitigation Strategy* (Footprint Ecology, March 2010) have been used to inform this assessment.

5.2 Location and Context

- 5.4 The *Development Brief* site is approximately 66 hectares in size and is situated within Hednesford Green Heath ward in Cannock Chase District.
- 5.5 The *Development Brief* provides guidance for the construction of 750 dwellings and associated community facilities (including open space and a new education provision). Any development will provide a range of house types and sizes which will be determined at the detailed Reserved Matters application stage.
- 5.6 It should be noted that the *Development Brief* does not provide any additional aspects that would lead to an increase in recreational pressure at Cannock Chase SAC, other than those outlined above.

⁷ *Land West of Pye Green Road, Cannock: Appropriate Assessment Screening* (Atkins Limited on behalf of St Modwen Properties Plc, May 2008)

⁸ *Cannock Chase AONB Visitor Survey* (Natural England, 2000)

5.3 Assessment of Adverse Effects on the Integrity of Cannock Chase SAC

- 5.7 The *Evidence Base relating to Cannock Chase SAC and the Appropriate Assessment of Local Authority Core Strategies* (Footprint Ecology, November 2009) carried out a detailed assessment of recreation effects on Cannock Chase SAC. This included an assessment of new development to be undertaken in the four local authority areas surrounding Cannock Chase SAC (as outlined in their emerging Core Strategies): Cannock Chase District Council (the proposed development is located in this area), Lichfield District Council, South Staffordshire District Council and Stafford Borough Council.
- 5.8 The *Evidence Base* notes that Cannock Chase SAC currently has a high level of visitor use and that the new housing proposed in the four emerging Core Strategies will lead to an increase in visitor levels to the SAC of at least 9%. Further to this there will also be additional increases as a result of new housing in the districts that were not included in the *Evidence Base*. A total of 23,075 houses will be provided within the four emerging Core Strategies⁹. The proposed development of 750 houses forms a very small proportion of this figure (approximately 3.25%).
- 5.9 The *Evidence Base* concludes that the predicted level of increase will potentially have an adverse effect on the integrity of Cannock Chase SAC through soil erosion, trampling of vegetation, increased fire risk, difficulties in instigating management and enrichment of habitats from dog fouling.
- 5.10 The *Evidence Base* identifies a 'Zone of Influence' around Cannock Chase SAC. The Zone of Influence is defined as the area where the origins of the majority of visitors to the site occur. For Cannock Chase SAC this was determined to be 12 miles (approximately 19.3 km) from the perimeter of the SAC.
- 5.11 The proposed development is located within the Zone of Influence, approximately 230 m south-west of Cannock Chase SAC.
- 5.12 Given the proximity of the proposed development to Cannock Chase SAC and the findings of the *Evidence Base*, it is considered that the provision of 750 dwellings (and associated community facilities) could lead to adverse effects on integrity of the SAC from increased recreational levels¹⁰.

5.4 Mitigation Measures

- 5.13 A number of mitigation measures will need to be put in place as part of any development in order to avoid adverse effects on the integrity of Cannock Chase SAC. These measures are outlined below in Sections 5.4.1 to 5.4.5 and accord with the mitigation measures identified in both the *Evidence Base* and the *Cannock Chase Visitor Impact Mitigation Strategy* (Footprint Ecology, March 2010):

5.4.1 No Development Zone

- 5.14 No development will be undertaken within 400 m of the perimeter of the SAC (in accordance with paragraph 8.3.7 of the *Evidence Base*).
- 5.15 On a precautionary basis, new dwellings will be located approximately 600 m south-west of Cannock Chase SAC at their closest point.

⁹ Taken from Table 1 in the *Evidence Base* (based on the higher/upper growth scenarios provided in this table).

¹⁰ This conclusion is based on the information currently available. The *Evidence Base* is being updated with visitor survey data collected in 2010 and 2011. Should the findings of the *Evidence Base* alter as a result of updated data, and should these findings be available prior to the finalisation of the Development Brief, the findings of this Stage 2 – Appropriate Assessment will be updated accordingly.

5.4.2 Suitable Alternative Natural Greenspaces

- 5.16 In order to retain as much recreational activity within the site as possible, appropriate areas of public open space will be provided. This will be achieved by providing Suitable Alternative Natural Greenspaces (SANGs) which residents can access for frequent use. The provision of SANGs will increase the local space available for recreational activities outside Cannock Chase SAC with the intention that the SAC is used for special visits rather than for general recreational activities that can be undertaken close to home in the SANGs.
- 5.17 The *Cannock Chase Visitor Impact Mitigation Strategy* (henceforth referred to as the *Mitigation Strategy*) and the *Guidelines for the Creation of Suitable Alternative Natural Greenspace (SANGs)*¹¹ state that SANGs may be created from the following:
- Existing open space of SANGs quality with no existing public access or limited public access, which for the purposes of mitigation could be made fully accessible to the public;
 - Existing open space which is already accessible but could be changed in character so that it is more attractive to a specific group of visitors who may otherwise visit the SAC;
 - Land in other uses which could be converted to SANGs.
- 5.18 The site is currently under private ownership and is used for the farming of arable crops. It is not currently accessible to the public. Therefore the site is a suitable area to provide SANGs.
- 5.19 The *Mitigation Strategy* states that 16 ha of SANGs should be provided per 1000 new population (paragraph 5.1.6). It is anticipated that a total of approximately 1,850¹² people will live within a completed development. Using the above standards, this equates to a total requirement for 29.6 ha of SANGs. To ensure that any potential adverse effect from new occupants is fully mitigated, based upon the illustrative Masterplan, the *Development Brief* is providing a total of 34.5 ha of SANGs fully meeting and exceeding the requirements of the *Mitigation Strategy*. With over half the strategic development site being devoted to SANGS, the majority of which being semi-natural open space, this total area of SANGs as indicated on the Ecology and Nature Conservation Strategy Plan includes the provision of formal and informal greenspace linked by footpaths and cycleways (see Appendix A).
- 5.20 Based on the Illustrative Masterplan (see Appendix A), the provision of SANGS is as follows:
- Informal public open space (including Sustainable Drainage System (SUDs) areas): 32.5 ha;
 - Formal public open space (including three children's play areas): 1.5 ha; and,
 - Allotments: 0.5 ha.
- 5.21 SANGs will therefore form a central component of any development proposals for the 66 ha site, contained wholly within the development site boundary. This means that the SANGs will be located immediately adjacent to the new housing, reducing any need for future residents to use cars to access the SANGs. The Ecology and Nature Conservation Strategy Plan indicates the areas of land that the SANGs will occupy within the site and indicates the different types of habitat to be provided within the SANGS in more detail, including:
- Informal public open space;
 - Formal public open space;

¹¹ Document provided by Grady McLean at Natural England (Version Dated 12/06/2008)

¹² This figure is based on the 2001 Census Average Household Size for Cannock Chase District being 2.47 and a total of 750 houses being provided at the proposed development.

- Community allotments;
- Existing areas of woodland and areas of proposed woodland planting;
- Existing hedgerows;
- Proposed tree planting areas;
- Attenuation areas (SUDs); and,
- Wet areas with biodiversity function.

- 5.22 Various routes that link the development to the SANGs will be provided. Routes through the SANGs within the proposed development will include a circular route that is approximately 3 km in length and other strategic footpaths and cycleways within the proposed development as indicated on the Ecology and Nature Conservation Strategy Plan which will involve a mixture of surfaced and unsurfaced pathways. Information boards will be provided to inform the visitors about the proposed development and the available routes, as well as appropriate signage providing directions.
- 5.23 Furthermore, the SANGs will be linked to greenspace adjacent to development (e.g. via existing Public Rights of Way) thus providing a network of sites and providing the potential for interconnected routes through greenspace within the Cannock area (e.g. longer walking routes). These links (referred to as Green Routes) are shown on Ecology and Conservation Habitat Strategy Plan.
- 5.24 Tables 5.2 and 5.3 provide a summary of the SANGs features to be included in development. The Tables acts as a checklist about the quality of the site both before and after development to include the SANGs. The Tables and criteria are taken from the *Guidelines for the Creation of Suitable Alternative Natural Greenspace (SANGs)*.

Table 5.2: SANG quality checklist – Must Haves (Criteria Essential for all SANGs)

No.	Criterion for SANG	Current at Pye Green site	Future SANGs at Pye Green site
1	<i>Parking on all sites larger than 4 hectares (unless the site is intended for use within 400 m only)</i>	There is currently no parking at the proposed development site (it is an arable field with no public access)	The SANGs are intended for use within 400 m of the proposed development only as the SANGs are being provided to mitigate for the 750 dwellings to be provided at the site. Therefore it is not necessary to provide parking for access to the SANGs.
2	<i>Circular walk of 2.3 to 2.5 km</i>	There is currently no public access to this site.	At least one circular route will be provided at the site at a length of approximately 3 km. This is shown on the Ecology and Nature Conservation Strategy Plan. This walk can be shortened by walkers cutting across the open space should they wish to. Additional routes through the SANGs will be provided. Indicative footpath routes are shown on the Ecology and Nature Conservation Strategy Plan. Routes will include a mixture of surfaced and unsurfaced pathways suitable for both pedestrians and cyclists. Hard surfaced pathways will be run alongside housing edges (as they will be formal footways serving front doors). Where pathways run away from the housing within open space areas (i.e. in the north-western and northern edges) and across the wooded depression, informal pathways (in the form of mown grass) will be provided.
3	<i>Car parks easily and safely accessible by car and clearly signposted.</i>	See Criterion 1 above.	See Criterion1 above.
4	<i>Access points appropriate for particular visitor use the SANGs is intended to cater for</i>	There is currently no public access to this site.	The SANGs is to cater for walking (particularly dog walking) and cycling activities, to help alleviate pressures on Cannock Chase SAC. Access to the SANGs will be from areas all over the development (as shown on the Ecology and Nature Conservation Strategy Plan). This will ensure that there is safe and easy access to the SANGs and will help encourage people from within the development to use the SANGs on a regular basis (rather than visit the SAC).
5	<i>Safe access route on foot from nearest car park and/or footpath</i>	There is currently no public access to this site.	Access routes are shown on Ecology and Nature Conservation Strategy Plan.
6	<i>Circular walk which starts and finishes at the car park.</i>	See Criterion 1 above.	There is no specific car park for access to the SANGs (see Criterion 1 above). However, as outlined for Criterion 2 above, a circular walk around the SANGs will be provided.
7	<i>Perceived as safe (i.e. no tree and scrub cover along part of the walking routes).</i>	There is currently no public access to this site and no walking routes present.	The circular route provided through the SANGs will be pass through an area of open space between two woodlands but will not enter areas of dense tree or scrub cover.

No.	Criterion for SANG	Current at Pye Green site	Future SANGs at Pye Green site
8	<i>Paths easily used and well maintained (but most unsurfaced)</i>	There is currently no public access to this site and no walking routes present.	Indicative footpath routes are shown on the Ecology and Nature Conservation Strategy Plan. Routes will include a mixture of surfaced and unsurfaced pathways suitable for both pedestrians and cyclists (as outlined in Criterion 2 above). Footpaths will be tarmac (or similar) or mown grass. As such they will be easy to use and maintain.
9	<i>Perceived as semi-natural with little intrusion of artificial structures.</i>	<p>Within the site there are two areas of semi-natural woodland. These are to be retained as part of the SANGs.</p> <p>The site is bound to the south and east by existing residential properties. To the north is woodland and to the west is Huntington Belt (a woodland strip) and semi-improved grassland fields.</p> <p>A large tower is located in the adjacent to the north-eastern corner of the development site.</p>	<p>The northern part of the site will be completely undeveloped and semi-natural open space will be provided in this area. This part of the SANGs is approximately 16 ha and connects to the other areas of semi-natural open space throughout the development.</p> <p>In addition a green corridor will be provided through the centre of the development, through woodland and adjacent to swales and waterbodies. Although the housing is likely to be visible at this location, the habitats to be provided reflect the existing habitats surrounding the site (e.g. the woodland areas).</p>
10	<i>If larger than 12 hectares then a range of habitats should be present.</i>	The site is a large arable field with two areas of woodland present within it.	<p>The SANGs will be approximately 34.5 ha in size and will provide the following different habitats within it:</p> <ul style="list-style-type: none"> • Informal public open space; • Formal public open space; • Community allotments; • Existing areas of woodland and areas of proposed woodland planting; • Existing hedgerows; • Proposed tree planting areas; • Attenuation areas (SUDs); and, • Wet areas with biodiversity function.

No.	Criterion for SANG	Current at Pye Green site	Future SANGs at Pye Green site
11	<i>Access unrestricted – plenty of space for dogs to fully exercise freely and safely off the lead.</i>	There is currently no public access to this site and therefore no access for dog walking.	A major component of the proposals is the northern part of the SANGs which will be informal greenspace approximately 340 m by 470 m in size (a total area of approximately 16 ha). Access within this area will be unrestricted and will be a suitable area for dogs to be exercised off the lead.
12	<i>No unpleasant intrusions (e.g. sewage treatment smells).</i>	There are currently no unpleasant intrusions within this site.	The development of the site will include the provision of dwellings and community facilities only (including a school and a community hall). The development will not include the construction of any development which could lead to unpleasant intrusions such as smells, noise or vibrations (e.g. recycling centres or sewage works).
13	<i>Clearly sign posted or advertised in some way</i>	There is currently no public access to this site.	As outlined in Section 5.4.4 below, a <i>Local Area Information Pack</i> will be provided to all new home owners within the development (explaining where the SANGs are). Furthermore, information boards will be provided detailing how to access and use the SANGs.
14	<i>Leaflets or websites advertising their location to potential users (distributed to homes and made available at entrance points and car parks)</i>	See Criterion 13 above.	See Criterion 13 above.

Table 5.3: SANG quality checklist – Desirable Features

No.	Criteria	Current	Future
1	<i>Dog owners can take dogs from the car park to the SANGs safely off the lead.</i>	There is currently no public access to this site and therefore no access for dog walking.	Not applicable – see Criterion1 in Table 5.2 above.
2	<i>Gently undulating topography</i>	The topography is gently undulating with two shallow ‘ridges’ falling northwest to south-east.	The whole of the development site is gently sloping downwards towards the southern boundary of the site. The northern part of the SANG (the 16 ha area of informal open space) will be gently undulating from north to south. The green corridor part of the SANG, located in the middle of the development, slopes gently from the north-west to the south-eastern corner of the development.
3	<i>Access points with signage outlining the layout of the SANGs and routes available</i>	There is currently no public access to this site.	As outlined in Table 5.2 above, information boards will be provided detailing how to access and use the SANGs.

	<i>to visitors</i>		
4	<i>Naturalistic space with areas of open (non-wooded) countryside and areas of dense and scattered trees and shrubs. Provision of open water is desirable.</i>	The site is a large arable field with two areas of woodland present within it.	A mixture of naturalistic habitats will be provided within the SANGs including woodlands and open water (as outlined in Criterion 10 in Table 5.2 above).
5	<i>Focal point such as a view point or monument within the SANGS</i>	There is currently no viewpoint or monument within this site.	There is the possibility of developing a viewpoint in the south-western corner of the site (looking out of the site, over the valley).

5.4.3 Access to Areas Outside of the Cannock Chase SAC

- 5.25 People within any proposed development will be encouraged to use areas outside the SAC (and the AONB) for recreation purposes in order to reduce the recreational pressure on the SAC.
- 5.26 Measures will include the provision of targeted signage to encourage people to use the other areas of public space/public rights of way available within and adjoining the site (i.e. the SANGs) and areas of to the east and west of the development site.
- 5.27 These measures will be developed in conjunction with: the Developer; the AONB Unit; Cannock Chase District Council; Staffordshire County Council; and the Forestry Commission.;

5.4.4 Education and Awareness Raising

- 5.28 It is recognised that there is a need to educate the new home owners about the importance of the Cannock Chase SAC (and the AONB). This is also highlighted in the *Mitigation Strategy* (Section 4). Furthermore, discussions between the Developer and the AONB Unit have revealed that there is a real problem in the ability of the AONB Unit to educate visitors to the SAC (and the AONB) about the national and international importance of Cannock Chase and its landscape and natural features and how to take account of this during recreational activities.
- 5.29 The construction of 750 new dwellings at the proposed development provides an excellent opportunity to educate the new home owners who will be located close to the SAC about the importance of the SAC and the need to conserve and protect this internationally important habitat.
- 5.30 A *Local Area Information Pack* will be provided in each of the new 750 dwellings. This document will highlight why the SAC (and AONB) is so important and what the residents can do to help protect the site. For example, the pack will encourage home owners to access the areas of open space outside the SAC/AONB (including the SANGs) and will provide guidance on the types of behaviour to be taken when visits are made to the SAC (e.g. by keeping to designated footpaths/cycleways, by keeping dogs under control and preventing dog fouling).
- 5.31 The *Local Area Information Pack* will be written in consultation with Natural England and the AONB Unit.

5.4.5 Developer Contribution

- 5.32 Discussions with the Forestry Commission are being undertaken to explore the potential to provide enhanced links to Huntington Belt (the woodland to the west of the proposed development) and direct people away from the Cannock Chase SAC. This may include the use of permissive rights of way within the woodland and linking this to existing Public Rights of Way in the vicinity of the site, suitable for usage by walkers and cyclists. The potential links between the Huntington Belt and the site are shown on the Ecology and Nature Conservation Strategy Plan.
- 5.33 This will help to deliver the measures outlined in Section 5.4.3 above, and enhance the links to habitats outside Cannock Chase SAC.

5.5 Consideration of the Area of Outstanding Natural Beauty

- 5.34 The mitigation measures outlined in Sections 5.4.2 to 5.4.5 above are in accordance with the AONB Unit's Final Draft of the *Cannock Chase Area of Outstanding Beauty Management Plan 2009 - 14* (particularly policies RP1, RP5, RP7, RP8, RP10, PP1, PP2 and SP10). These steps have been

discussed with the AONB Unit¹³ and they consider them to be an appropriate way of mitigating the potential of increased recreational pressure on the Cannock Chase SAC and the AONB.

5.6 Conclusions

- 5.35 The construction and operation of 750 new dwellings (and the associated community facilities) may, taking into account the conservation objectives, lead to adverse effects on the integrity of Cannock Chase SAC as a result of increased recreational pressure (through soil erosion, trampling of vegetation, increased fire risk, difficulties in instigating management and enrichment of habitats from dog fouling).
- 5.36 As outlined above, very significant mitigation measures have been outlined in Section 5.4 to ensure that there will not be any adverse effects on the SAC from increased recreational pressure as a result of new development.
- 5.37 With such mitigation measures in place, it is considered that the proposed development 'alone' or 'in combination' with other developments will not lead to adverse effects on the integrity of the Cannock Chase SAC.

¹³ Meeting with Ruth Hytch (Cannock Chase AONB Officer) at the AONB Unit on 23rd March 2009

6. Assessment of Changes in Air Quality

6.1 Introduction

- 6.1 This section of the Stage 2 – Appropriate Assessment describes the assessment of air quality effects on the sensitive ecosystems within Cannock Chase SAC.
- 6.2 The Stage 1 - Screening report¹⁴ identified the effects of nitrogen deposition and acid deposition from the proposed development as potentially of concern for lowland heathland habitats, as found at Cannock Chase SAC.
- 6.3 Acid deposition consists of sulphur dioxide, ammonia and nitrogen oxides. The UK Air Pollution Information System¹⁵ (APIS) website provides data on critical levels for these pollutants in lowland heathland habitat as detailed below:
- Sulphur dioxide: 20 µg/m³ annual mean and half-year (Oct-March) mean;
 - Ammonia: 3 µg/m³ annual mean; and
 - Nitrogen oxides: 30 µg/m³ annual mean NO_x as NO₂; 75 µg/m³ 24-hour mean NO_x as NO₂.
- 6.4 The primary sources of sulphur dioxide emissions are coal or mineral oil-fired combustion for electricity generation and certain other industrial processes such as hydrocarbon and metal refining. The primary source of ammonia emissions is agriculture. Such sources will not be incorporated into the proposed residential development and the effects of these pollutants is not considered further in this assessment.
- 6.5 Oxides of nitrogen are produced in combustion processes with half of UK emissions attributable to motor vehicles. This report has focussed on the effect of additional vehicle emissions due to the proposed development on NO_x concentrations and nitrogen deposition within the SAC.

6.2 Planning Context and Regulatory Framework

6.2.1 Ecological Limit Values

- 6.6 The EU has set limit values for the protection of vegetation for oxides of nitrogen (NO_x) based on the work of the United Nations Economic Commission for Europe (UNECE) and World Health Organisation (WHO). These limit values have been incorporated into the Air Quality Standards Regulations (SI 2010/1001).
- 6.7 The EU limit value for NO_x for the protection of vegetation is 30 µg/m³ as an annual mean. This is the same as the UK Air Quality Strategy (AQS) objective. This limit value applies to locations more than 20 kilometres from towns with more than 250,000 inhabitants or more than five kilometres from other built-up areas, industrial installations or motorways. As monitoring sites need to be representative of an area of 1000 square kilometres, the limit does not have a statutory basis in micro-scale environments such as those close to a road.
- 6.8 The UNECE and the WHO have set a critical level for NO_x for the protection of vegetation. Therefore the Statutory Nature Conservation Agencies' (in England, Natural England) policy is to

¹⁴ *Land to the West of Pye Green Road, Cannock: Appropriate Assessment Screening* (Atkins Limited, May 2008)

¹⁵ www.apis.ac.uk

apply the 30 µg/m³ criterion, on a precautionary basis, as a benchmark, in internationally designated conservation sites and SSSIs.

- 6.9 In addition, critical loads for nitrogen deposition have been set that represent (according to current knowledge) the exposure below which there should be no significant harmful effects on sensitive elements of the ecosystem. These have been established for a number of habitats dependent on low nitrogen levels. Critical loads are expressed in deposition units of kilograms of nitrogen per hectare per year (kg N/ha/yr).

6.3 Methodology

6.3.1 Sensitive Ecosystems

- 6.10 Some air pollutants may have an effect on vegetation. Annex F to the DMRB¹⁶ provides guidance on assessing the potential effect of air quality upon ecosystems. An assessment of concentrations of total oxides of nitrogen (NO_x) and nitrogen deposition is required where any of the following site designations are identified within 200 m of roads affected by the proposals and where the designated features are sensitive to air pollution:

- Special Area of Conservation (SAC);
- Special Protection Area (SPA);
- proposed Special Protection Area (pSPA) or candidate Special Area of Conservation (cSAC);
- sites listed under the Convention on Wetlands and Wildfowl (Ramsar sites); or
- Sites of Special Scientific Interest (SSSI).

- 6.11 The DMRB air quality screening method, as amended following publication of Defra Technical Guidance TG(09)¹⁷, was used to estimate concentrations of nitrogen oxides (NO_x) and nitrogen dioxide (NO₂) on transects through Cannock Chase SAC at intervals from the roadside up to a distance of 200 m (see Table 6.1 below).

- 6.12 The screening method takes into account:

- annual average daily vehicle flows and speeds;
- the proportion of heavy duty vehicles (HDVs)¹⁸;
- changes in future exhaust emissions due to legislation;
- road type;
- background concentrations; and
- the distance between the receptor and the roads carrying the traffic.

- 6.13 Assessments were made on five transects through the SAC (Table 6.1) in the vicinity of the proposed development at intervals from the roadside up to a distance of 200 m for the following scenarios:

- Base Case (2008); and

¹⁶ Highways Agency Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 1, *Air Quality* (revised May 2007, Ref: HA 207/07).

¹⁷ Defra, *Local Air Quality Management*, Technical Guidance, LAQM.TG(09) (February 2009)

¹⁸ Any vehicle with a gross weight greater than 3.5 tonnes, including heavy goods vehicles (HGVs) and coaches.

- Opening year (2011) both with and without the development, termed the 'Do-Something' and 'Do-Nothing' scenarios respectively.

Table 6.1: Identification of Air Quality Transects

Transect	Road
T1	A460 Rugeley Road
T2	Brindley Road
T3	Brindley Heath Road
T4	Penkridge Bank
T5	Camp Road

6.3.2 Traffic Data

6.14 Traffic flow data used in the assessment was sourced from the Pye Green EIA Scoping Report (September 2008). The number of houses in the *Development Brief* has increased from 600 to 750 along with the addition of a school and other community facilities. The transport engineers have concluded that the traffic data is robust enough to cover the additional houses¹⁹. However a 25% increase²⁰ to the traffic flows in the future Do-Something scenario has been included to account for the increase in traffic due to the school and other community facilities to be provided within the proposed development. A summary of the traffic data, including the new flows, is provided in Appendix B.

6.3.3 Background Concentrations

6.15 Estimates of background concentrations were obtained for the study area for the air quality assessment from 1 km square resolution grid data provided by Defra²¹. This data provides total concentrations of NO_x and NO₂ for each grid square. In addition a set of source sectors are provided for NO_x to enable the individual emission sectors to be subtracted from the total concentrations when modelling of that sector has been carried out. This should avoid double counting of sources. To be conservative no sectors have been subtracted for total grid square backgrounds for this assessment. The background concentrations for the 1 km grid squares containing the transects are provided in Table 6.2 below. Assessment of the additional contribution of road traffic emissions follows in Section 6.4 to allow comparison of total pollutant concentrations with air quality objective levels for NO_x and calculation of expected nitrogen deposition rates.

²⁰ There is an increase of 25% of houses being provided within the proposed development (from 600 to 750 houses). Increasing the traffic flows by 25% will therefore be sufficient to allow for the additional houses and community facilities to be provided within the proposed development.

²¹ <http://laqm1.defra.gov.uk/review/tools/background-maps-info.php?year=2008>

Table 6.2: Background Concentrations of NO_x and NO₂

Transect	Grid Square	2008		2011	
		NO _x (µg/m ³)	NO ₂ (µg/m ³)	NO _x (µg/m ³)	NO ₂ (µg/m ³)
T1	401500,314500	18.1	12.7	14.7	10.6
T2	399500,314500	17.8	13.0	14.5	10.8
T3	400500,314500	17.8	12.5	14.5	10.4
T4	399500,316500	15.1	11.2	12.2	9.2
T5	398500,315500	16.2	11.9	13.1	9.8

- 6.16 The APIS website provides information on nitrogen deposition rates and critical loads for designated features within SACs. The Cannock Chase SAC is described as European dry heaths and Northern Atlantic wet heaths with cross-leaved heath (*Erica tetralix*), being the primary reason and qualifying feature habitats for the SAC designation respectively.
- 6.17 The critical load for nitrogen deposition in this heathland habitat is:
- 10-20 kg N/ha/yr for dry heaths; and
 - 10-25 kg N/ha/yr for wet heaths.
- 6.18 The effects of nitrogen deposition in excess of these ranges may lead to a transition of heather to grass, a decline in lichens, and ericaceous species susceptible to frost and drought.

6.4 Assessment of Air Quality for Sensitive Ecosystems

6.4.1 Assessment of NO_x Concentrations

- 6.19 NO_x concentrations were estimated at 10, 20, 70, 115, 175 and 200 m from the road centreline on five transects identified in Table 6.1 through Cannock Chase SAC to assess whether the annual mean limit value for NO_x for the protection of vegetation of 30 µg/m³ was exceeded.
- 6.20 The results are presented in Table 6.3.
- 6.21 Concentrations of NO_x are estimated to be below the 30 µg/m³ annual mean ecological limit value (see Section 6.2.1 above) in all scenarios for all transect locations.

Table 6.3: Estimated Annual Mean NO_x Concentrations (µg/m³)

	2008 Base Year	2011 Do-Nothing	2011 Do-Something
Transect 1			
*65 m	20.9	17.0	17.5
115 m	19.0	15.4	15.5
175 m	18.4	15.0	15.0
200 m	18.3	14.9	14.9
Transect 2			
10 m	20.4	16.5	17.3
20 m	19.8	16.0	16.6
70 m	18.4	14.9	15.1
115 m	18.0	14.6	14.7
175 m	17.9	14.5	14.6
200 m	17.9	14.5	14.5
Transect 3			
10 m	22.1	18.3	19.5
20 m	21.0	17.4	18.3
70 m	18.8	15.4	15.6
115 m	18.1	14.8	14.9
175 m	17.9	14.6	14.7
200 m	17.9	14.6	14.6
Transect 4			
10 m	20.6	17.7	21.7
20 m	19.3	16.4	19.4
70 m	16.3	13.4	14.3
115 m	15.5	12.6	12.9
175 m	15.2	12.4	12.5
200 m	15.2	12.3	12.4
Transect 5			
10 m	21.2	17.7	19.0
20 m	20.0	16.6	17.6
70 m	17.3	14.1	14.4
115 m	16.6	13.4	13.5
175 m	16.3	13.2	13.3
200 m	16.3	13.2	13.2

* Transect 1 doesn't overlap with the SAC until a distance of 65 metres from the road centreline.

6.4.2 Assessment of Nitrogen Deposition

6.22 The nitrogen deposition rate was determined based on background deposition rates plus the increment due to the selected road for the "Do-Nothing" and "Do-Something" scenarios. The change

in deposition rate due to the scheme was noted and the total deposition rate compared with the UNECE critical load for dry heath habitats (10-20 kg N/ha/yr).

- 6.23 The total nitrogen deposition rate was determined for the five kilometre square within which each transect lies. Deposition rate data for 2007 were obtained from APIS, and adjusted for the opening year scenarios by reducing rates by 2% per year in accordance with the methodology given in Annex F to the DMRB. Background NO₂ and NO_x concentrations were obtained from Defra²¹ for the 5 km square within which each transect lies.
- 6.24 Deposition rates obtained for 2007 are shown in Table 6.4.

Table 6.4: Deposition Rates from Air Pollution Information System (APIS) website

Transect	5 km Grid Square	Deposition rate (kg N/ha/yr)
T1	400000,310000	19.6
T2	395000,310000	24.6
T3	400000,310000	19.6
T4	395000,315000	20.0
T5	395000,315000	20.0

- 6.25 Concentrations of NO₂ were determined at every interval on each transect in each scenario using the DMRB air quality screening method. The dry nitrogen deposition rate is estimated at each transect interval NO₂ concentration and for the 5 km square average background NO₂ concentration, using Equation 1:

$$\text{Equation 1: } 1 \mu\text{g/m}^3 \text{ of NO}_2 = 0.1 \text{ kg N/ha/yr.}$$

- 6.26 Annex F of the DMRB states that a road contribution dry deposition rate should be calculated by subtracting the transect interval dry deposition rate from the APIS 5 km square dry deposition rate.
- 6.27 Cannock Chase SAC is located between the urban areas of the West Midlands conurbation and Stafford. The surrounding area also includes a number of busy motorways. The average background five kilometre square concentrations were higher than the one kilometre grid squares containing the transects used in the DMRB screening tool calculations. On this basis the road increment dry deposition rate was determined from the NO₂ roads contribution concentration, to avoid having a negative road contribution. The APIS 5 km square dry nitrogen deposition rate was added to the transect interval road increment dry nitrogen deposition rate to give the total deposition rate.
- 6.28 The changes in total deposition rate on each transect are presented in Table 6.5 to Table 6.9.

Table 6.5: Estimated Annual Mean Nitrogen Deposition Rate (kg N/ha/yr) for Transect 1

	Total N deposition rate	Road increment	Road increment as % of total
Do-Nothing			
65 m	18.2	0.1	0.7
115 m	18.1	<0.1	0.2
175 m	18.0	<0.1	0.1
200 m	18.0	<0.1	<0.1
Do-Something			
65 m	18.2	0.1	0.8
115 m	18.1	<0.1	0.2
175 m	18.0	<0.1	0.1
200 m	18.0	<0.1	<0.1

Table 6.6: Estimated Annual Mean Nitrogen Deposition Rate (kg N/ha/yr) for Transect 2

	Total N deposition rate	Road increment	Road increment as % of total
Do-Nothing			
10 m	22.7	0.1	0.5
20 m	22.7	0.1	0.3
70 m	22.7	<0.1	0.1
115 m	22.6	<0.1	<0.1
175 m	22.6	<0.1	<0.1
200 m	22.6	<0.1	<0.1
Do-Something			
10 m	22.8	0.1	0.6
20 m	22.7	0.1	0.5
70 m	22.7	<0.1	0.1
115 m	22.6	<0.1	<0.1
175 m	22.6	<0.1	<0.1
200 m	22.6	<0.1	<0.1

Table 6.7: Estimated Annual Mean Nitrogen Deposition Rate (kg N/ha/yr) for Transect 3

	Total N deposition rate	Road increment	Road increment as % of total
Do-Nothing			
10 m	18.2	0.2	1.1
20 m	18.2	0.2	0.8
70 m	18.1	<0.1	0.2
115 m	18.0	<0.1	0.1
175 m	18.0	<0.1	<0.1
200 m	18.0	<0.1	<0.1
Do-Something			
10 m	18.3	0.3	1.4
20 m	18.2	0.2	1.1
70 m	18.1	0.1	0.3
115 m	18.1	<0.1	0.1
175 m	18.0	<0.1	0.1
200 m	18.0	<0.1	<0.1

Table 6.8: Estimated Annual Mean Nitrogen Deposition Rate (kg N/ha/yr) for Transect 4

	Total N deposition rate	Road increment	Road increment as % of total
Do-Nothing			
10 m	18.7	0.3	1.5
20 m	18.6	0.2	1.2
70 m	18.5	0.1	0.3
115 m	18.4	<0.1	0.2
175 m	18.4	<0.1	0.1
200 m	18.4	<0.1	<0.1
Do-Something			
10 m	18.9	0.5	2.6
20 m	18.8	0.4	2
70 m	18.5	0.1	0.6
115 m	18.5	0.1	0.3
175 m	18.4	<0.1	0.1
200 m	18.4	<0.1	0.1

Table 6.9: Estimated Annual Mean Nitrogen Deposition Rate (kg N/ha/yr) for Transect 5

	Total N deposition rate	Road increment	Road increment as % of total
Do-Nothing			
10 m	18.7	0.3	1.4
20 m	18.6	0.2	1.1
70 m	18.5	0.1	0.3
115 m	18.4	<0.1	0.2
175 m	18.4	<0.1	0.1
200 m	18.4	<0.1	<0.1
Do-Something			
10 m	18.7	0.3	1.7
20 m	18.6	0.2	1.3
70 m	18.5	0.1	0.4
115 m	18.4	<0.1	0.2
175 m	18.4	<0.1	0.1
200 m	18.4	<0.1	<0.1

- 6.29 The additional road contribution to the total deposition rates at the modelled locations is below 2.6% of the total in both the future Do-Nothing and Do-Something scenarios at all locations.
- 6.30 The difference between the two scenarios is less than 0.1 kg N/ha/yr, at most roadside locations. Transect 4 roadside has a difference of 0.2 kg N/ha/yr which has diminished by a distance of 70 m from the road. Road contributions lessen with increasing distance from the road.
- 6.31 Differences between the Do-Something and Do-Nothing scenarios at all locations are so small they can be considered negligible.
- 6.32 At all transects apart from Transect 2, the total deposition exceeds the lower bound of the critical load but remain below the upper bound of the critical load in both future Do-Nothing and Do-Something scenarios. However, Transect 2 exceeds the upper bound of the critical load in both future Do-Nothing and Do-Something scenarios before the road contribution is included.
- 6.33 It is considered that the data used to formulate these figures presents a worst case scenario. The previous traffic figures used for the HRA (based on 600 houses) are robust enough to cover the 750 houses to be provided at the site. However, as a precaution a 25% increase to traffic numbers has been added (to take into account the community facilities at the site). Using the previous data, the total deposition exceeds the lower bound of the critical load but remain below the upper bound of the critical load in both future Do-Nothing and Do-Something scenarios for all five transects (with only a 2% additional road contribution to the total deposition rates).
- 6.34 The proposed development has been designed in order to minimise these effects. In order to reduce the need to travel from the development (particularly by the private car) and to deliver sustainable patterns of movement, the Development Brief outlines that any proposed development should provide on-site facilities including: a local centre (including local day-to-day retail units, GP's facility and community hall), a primary school and public open space (including allotments, formal sports

pitches and a range of play facilities). An indicative layout is shown on the Illustrative Masterplan²². The school and local centre are provided centrally to the housing area to minimise travel distances and encourage internal trips by foot and cycle and the design of the transport network reflects the priority for sustainable transport modes through the site (with particular emphasis on movement towards the complementary facilities to be provided on site). Furthermore, the site and the surrounding area are well served by the very frequent circular bus service towards Cannock and Hednesford. There is potential to upgrade and provide additional bus stops around the perimeter of the site which will enhance accessibility and linkages to the development. The transport strategy therefore assists in the reduction of emissions, helping to reduce adverse effects from air quality on Cannock Chase SAC.

6.5 Conclusions

- 6.35 Taking into account the conservation objectives, there will be no adverse effects on the integrity, of the Cannock Chase SAC 'alone' or 'in combination' from NO_x. This is because concentrations of NO_x at all transects in the base, Do-Nothing and Do-Something scenarios are estimated to be below the 30 µg/m³ annual mean limit value for the protection of vegetation present in the SAC.
- 6.36 At present, the total deposition rate of nitrogen deposition is currently within the critical load for the protection of vegetation within most parts of the SAC. On Transect 2 where the deposition rate exceeds the upper bound of critical load the road contribution accounts for less than 1% of the total deposition in both future Do-Nothing and Do Something scenarios. The air quality assessment at all other locations has shown that the difference between the future Do-Nothing and Do-Something scenarios is below 2.6% of the total. The differences between the Do-Something and Do-Nothing scenarios at all locations are so small they can be considered negligible and in the change in nitrogen deposition due to proposed development is not considered significant. Therefore, taking into account the conservation objectives and the overall design layout and land uses within the potential development, there will be no adverse effects on the integrity, of the Cannock Chase SAC 'alone' or 'in combination' from nitrogen deposition.

²² Drawing No 500_004 (produced by RPS in November 2010)

7. Assessment of Increased Water Abstraction

7.1 Introduction

- 7.1 This section of the Stage 2 – Appropriate Assessment describes the assessment of the potential for increased water abstraction and the possible effects on the sensitive ecosystems within Cannock Chase SAC.
- 7.2 The Stage 1 - Screening report²³ identified that the construction of new dwellings on the development site may lead to additional pressure on the public water supply. This in turn may lead to increased water abstraction and ultimately may have adverse effects on the integrity of the wetland habitats within Cannock Chase SAC.
- 7.3 There are two water utility companies operating in this part of Staffordshire: Severn Trent Water (STW) and South Staffordshire Water (SSW). The Stage 2 – Appropriate Assessment completed in March 2009 determined that SSW would be supplying water to the proposed development site to the west of Pye Green Road, Cannock (see Appendix C). A summary of the HRA work completed to date by both water utility companies is provided below.

7.2 Water Abstraction by Severn Trent Water

- 7.4 At the Stage 1 - Screening stage of the proposed development (completed in May 2008), it was understood that both STW and the Environment Agency (EA) were undertaking Stage 1 - Screenings investigating the impact of their abstractions on Cannock Chase SAC. These assessments were considered particularly pertinent to the Stage 2 – Appropriate Assessment of the proposed development completed in March 2009 as they were examining the impacts of public water supply abstractions and their effects on Cannock Chase SAC. Two of STW's abstraction points were noted to be of concern including abstraction at Milford and Bednall
- 7.5 Following submission of the HRA Stage 1 - Screening of the proposed development to Natural England, they requested that a review of the HRA Stage 1 - Screenings being undertaken by the EA and STW were reviewed as part of the Stage 2 – Appropriate Assessment²⁴.
- 7.6 When the previous Stage 2 – Appropriate Assessment was completed in March 2009, these assessments had not yet been completed due to insufficient information about the impacts on the SAC at certain locations (suggesting that there may be likely significant effects on the SAC). Therefore, it was not possible previously to review the findings of the EA/STW HRA work as part of the previous Stage 2 assessment.
- 7.7 However, as outlined in Section 4 above, there has been ongoing work between the EA and STW in relation to effects on Cannock Chase SAC. Stage 4 of the Review of Consents (RoC) process was carried out in March 2010 and this concluded the abstraction licences at Milford and Bednall could adversely impact the qualifying features of Cannock Chase SAC at fully licensed rates.
- 7.8 The EA has limited abstraction rates at Milford and Bednall until STW are able to provide evidence that abstraction at the fully licensed quantity does not lead to significant effects on Cannock Chase

²³ *Land to the West of Pye Green Road, Cannock: Appropriate Assessment Screening* (Atkins Limited, May 2008)

²⁴ Page 3 of *EIA Screening Opinion for Residential Housing Development: Land West of Pye Green Road, Cannock* letter from Natural England to Cannock Chase District Council (Ref: SJ91/STS/1 sent on 10/10/2008)

SAC (STW will be carrying out a pumping test at fully licensed rates in summer of 2011 or before if possible). Furthermore, the STW Water Resources Management Plan (WRMP) has been subject to HRA Stage 1 Screening²⁵ and this has concluded that there are no likely significant effects on international sites (including Cannock Chase SAC). Given the abstraction limits that have been enforced by the EA at Milford and Bednall, and the conclusion of the HRA of STW WRMP, water can be supplied to the areas of new growth to be constructed in the parts of Staffordshire covered by STW without causing likely significant effects on Cannock Chase SAC.

7.3 Water Abstraction by South Staffordshire Water

- 7.9 In accordance with EA standards, SSW has completed the Review of Consents (RoC) process of all of their abstraction points. The RoC process has determined that none of the SSW abstraction points are having significant effects on any international sites (including Cannock Chase SAC). These findings have been agreed with both the EA and Natural England.
- 7.10 SSW have completed their Water Resources Management Plan²⁶ and this has confirmed that they have sufficient water within their current abstraction licence and dry year resource availability to provide the additional demand raised by the construction of the development site. SSW has confirmed that there is no deficit in water supplied for the over the next 25 years (to supply the whole area covered by SSW) and that there will be no change to current consented abstraction licences and no schemes for new water resources.
- 7.11 SSW has not been required to progress to the next stage of the RoC process and there is no need for HRA work to be undertaken on their Water Resources Management Plan (WRMP)²⁷. SSW can therefore supply water to the proposed development (in addition to the increased levels of housing likely to occur in Staffordshire over the next 25 years) without this operation leading to likely significant effects on Cannock Chase SAC.

7.4 Assessment of Adverse Effects on the Integrity of Cannock Chase SAC

- 7.12 SSW will be supplying water to the proposed development. SSW has determined through the RoC process that their water abstraction points are not having likely significant effects on Cannock Chase SAC. SSW can therefore supply water to the proposed development without this operation leading to adverse effects on the integrity of Cannock Chase SAC.

7.5 Conclusions

- 7.13 For the reasons outlined in Section 7.3 and 7.4 above, taking into account the conservation objectives, there will be no adverse effects on integrity 'alone' or 'in combination' on Cannock Chase SAC as a result of increased water abstraction to supply the development of the site.

²⁵ At the time of writing this HRA report was not available to the public. However, the findings of this report were summarised in Section 4.4.6 of STW's WRMP.

²⁶ *South Staffordshire Water: Response to Representations On The 2008 Draft Water Resources Management Plan* (January 2009). This document is essentially the final Water Resources Management Plan as it incorporates all changes to the Plan following the consultation process and gives responses to all comments from the Stakeholders.

²⁷ Personal communication with Matt Hudson (Water Resource Manager at South Staffordshire Water) on 30/06/2010.

8. Conclusions

- 8.1 This Stage 2 - Appropriate Assessment has been completed in accordance with the Conservation of Habitats Species Regulations 2010 (the Habitat Regulations). This Habitats Regulations Assessment (HRA) of the proposed development of 750 houses and the associated community facilities on the land to the west of Pye Green Road, Cannock. This Stage 2 – Appropriate Assessment ascertains whether the construction and operation of the development site will have adverse effects on the integrity of Cannock Chase Special Conservation Area (SAC).
- 8.2 The Council is aware that a Stage 1 - Screening was carried out by the Developer in May 2008 identified three main potential impacts on the Cannock Chase SAC which may have a likely significant effect (alone or in combination) on the international site. These included:
- Increased recreational use of the SAC;
 - A potential deterioration in air quality; and
 - A potential increase in water abstraction.
- 8.3 It was not possible to determine if these effects were significant at the Stage 1 - Screening stage. The precautionary principle enshrined with the Habitat Regulations was employed and the next stage of the Habitats Regulations Assessment, a Stage 2 - Appropriate Assessment, was recommended to be carried out.
- 8.4 The Developer then completed a Stage 2 – Appropriate Assessment to consider these likely significant effects further in order to determine if they would lead to adverse effects on the integrity of Cannock Chase SAC.
- 8.5 A Stage 2 – Appropriate Assessment was completed in March 2009²⁸. This assessment determined that, with mitigation, there would be no adverse effect on the integrity of Cannock Chase SAC. However, since the time the Stage 2 – Appropriate Assessment report was produced the details of the proposed development have altered. The March 2009 report was produced on the basis that 600 houses were to be constructed at the site. As outlined above, a total of 750 houses are now identified in the *Development Brief* for the site as well as community facilities (including an education provision). It has therefore been necessary to update the Stage 2 report to ensure that there is no change in findings in relation to effects of the site on the integrity of Cannock Chase SAC.
- 8.6 This updated Stage 2 – Appropriate Assessment has determined that, taking into account the conservation objectives, there will be no adverse effects on the integrity of Cannock Chase SAC from a deterioration in air quality or an increase in water abstraction as a result of the *Development Brief* or the construction and operation of 750 houses (and the associated community facilities).
- 8.7 Potential adverse effects on the integrity of the SAC (and its conservation objectives) have been identified through an increase in recreational use of the SAC once the development is completed. However, significant mitigation measures to address these adverse impacts have been determined and will include the following:
- No development to be constructed within 600 m of the SAC;
 - The provision of 34.5 hectares of Suitable Alternative Natural Greenspace within the proposed development;

²⁸ *Information for Habitats Regulations Assessment: Proposed Phase 1 Development on Land West of Pye Green Road, Cannock* (Atkins Limited, March 2009)

- Encouraging access to areas outside Cannock Chase SAC (and the AONB) for recreational purposes;
- Educating and raising awareness of new home owners about the importance of Cannock Chase SAC (and the AONB); and
- Ongoing discussions with the Forestry Commission, through joint working, provide enhanced links to and within the Huntington Belt (a woodland to the west of the site). This will help encourage people away from the SAC.

8.8 Taking account of these mitigation measures which will be implemented, it is considered that there will be no adverse effects on the integrity of Cannock Chase SAC (alone or in combination with other projects and plans).

Appendix A

Drawings

Appendix B

Traffic Data Used in the Air Quality Assessment

Table B.1 - Traffic Data Used in the Assessment

Transect	Link ID	Link Name	AADT			%HDV ²⁹	Speed (kph) ³⁰
			Base 2008	DM 2011	DS 2011		
T1	10	A460 Rugeley Road	9,160	9,300	11,513	5 ³¹	64
T2	6	Brindley Road	2,390	2,430	3,325	4 ³²	48
T3	5	Brindley Heath Road	4,010	4,480	5,888	4	48
T4	1	Penkridge Bank	5,230	6,440	11,175	4	48
T5	4	Camp Road	4,720	5,480	7,000	4	48

²⁹ Any vehicle with a gross weight greater than 3.5 tonnes, including heavy goods vehicles (HGVs) and coaches.

³⁰ Assumed average speeds based on road type.

³¹ HDV ratio of 5% for this link was obtained from DfT data.

³² In the absence of site specific traffic count data, 4% HDV for links 6, 5, 1 and 4 was consistent with the assumptions made in the earlier EIA scoping study

Appendix C

Response from Water Resources Manager at South Staffordshire Water

From: Matthew J. Hudson [mailto:matthewhudson@south-staffs-water.co.uk]
Sent: 11 March 2009 15:37
To: Novak, Steven
Subject: RE: Pye Green - Water Supply Confirmation required

Steve

please see my response below

Matt

From: Novak, Steven [mailto:Steven.Novak@atkinsglobal.com]
Sent: 11 March 2009 14:41
To: Matthew J. Hudson
Subject: Pye Green - Water Supply Confirmation required
Importance: High

Matt,

Further to our brief discussion yesterday and to previous conversations that you have had with Cat Warner (Atkins Ecologist), we need to have in writing from the Water Authority that would potentially supply potable water to the above site (namely South Staffs Water), confirmation of the following aspects to incorporate with our Appropriate Assessment that is currently being undertaken.

Please can you confirm the following details:

- That South Staffordshire Water are indeed the supplier to the site Pye Green site; [yes South Staffs would be the supplier](#)
- That they are able to supply the site within their current abstraction limits; [yes south Staffs has sufficient abstraction licence and dry year resource availability to meet this demand. we are forecasting a surplus of supply over demand for the next 25 years](#)
- That the abstraction points for the water to supply the site do not have any connection with the aquifers underneath Cannock Chase SAC (you may need to double check this against the SAC catchment); and [South Staffordshire Water has a single resource zone, whereby water can be transferred around all parts of the Company. None of our abstractions have been identified by Natural England or the Environment Agency as being a risk to the designated Cannock Chase SAC site. This has been confirmed as part of the existing Review of Consents Process.](#)
- That South Staffordshire water have looked at their abstraction points and that they have concluded that there are no likely significant effects on the Cannock Chase SAC (with evidence/reasoning explaining this conclusion). [Under the existing Review of Consents Process we are not required to assess impact unless identified by EA/NE. Only Severn Trent Water sources have been identified by EA/NE.](#)

We have previously submitted a development enquiry to request availability and supply costs for the site (your ref - DS/SPEC/SC)

Your earliest response would be appreciated as we have to provide the client with a draft by this Friday (13/3)

Thanks again for your time and look forward to your response.

Please do not hesitate to call to discuss any of the above.

Kind regards

Steve

Steve Novak
Civil Engineer
Water & Environment

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