

National Park / long distance route / recreational route

National / regional cycle route

National Trust

Nature reserve

Garden

Forestry Commission access land

Places of tourist interest

Picnic site

Community forest

AONB

Open access land (indicative area / boundary)

0 km

4 km

The Crown Estate

Gorhambury LDF Submission

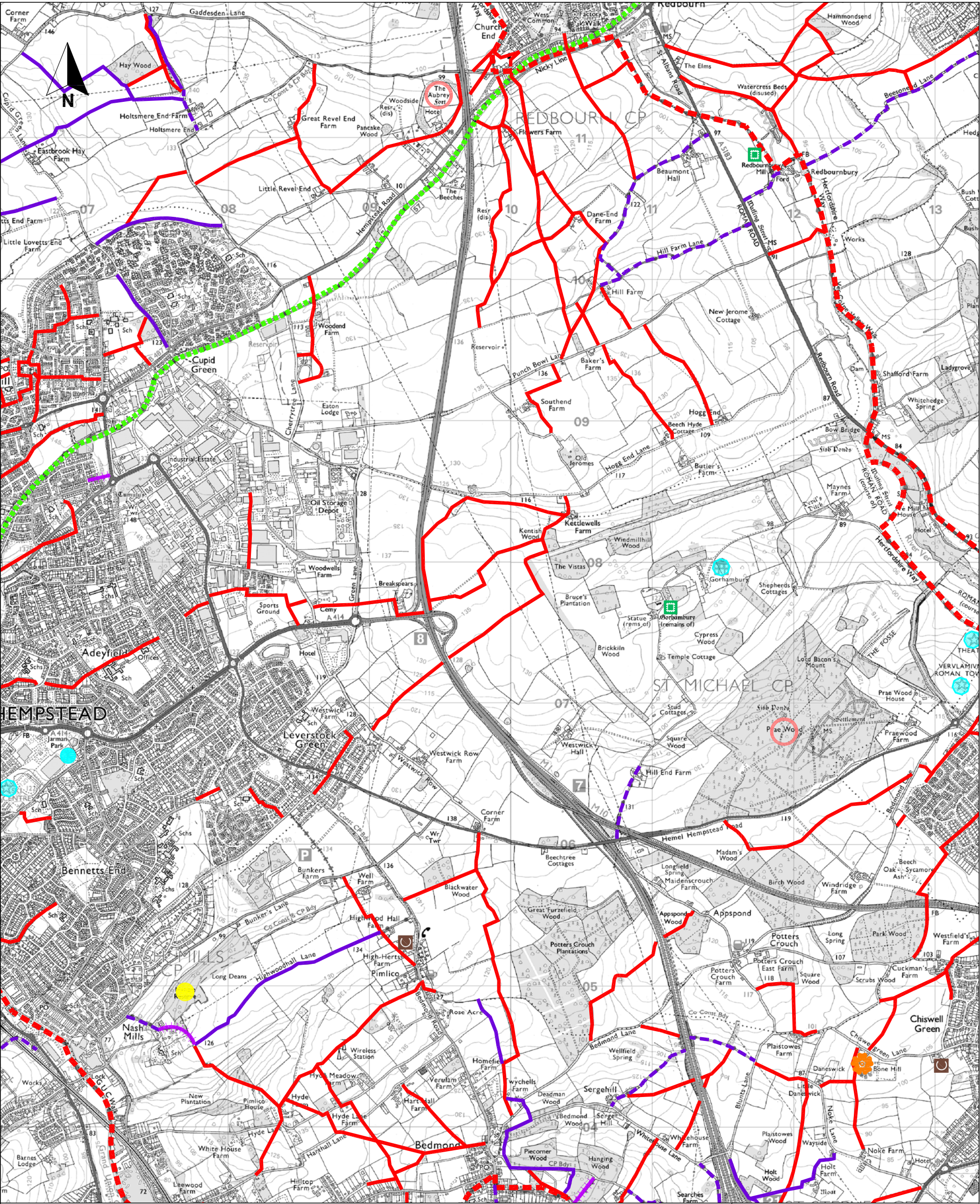
Figure B9.1

Existing Informal Recreation and Public Access Provision - Strategic

November 2007

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Key

National Park / long distance route / recreational route

National / regional cycle route

Footpath

Bridleway

Road used as a public path

Other route with public access

National Trust

Nature reserve

Garden

Historic feature

Horseriding

Sports / leisure centre

Tourist feature

English Heritage Site

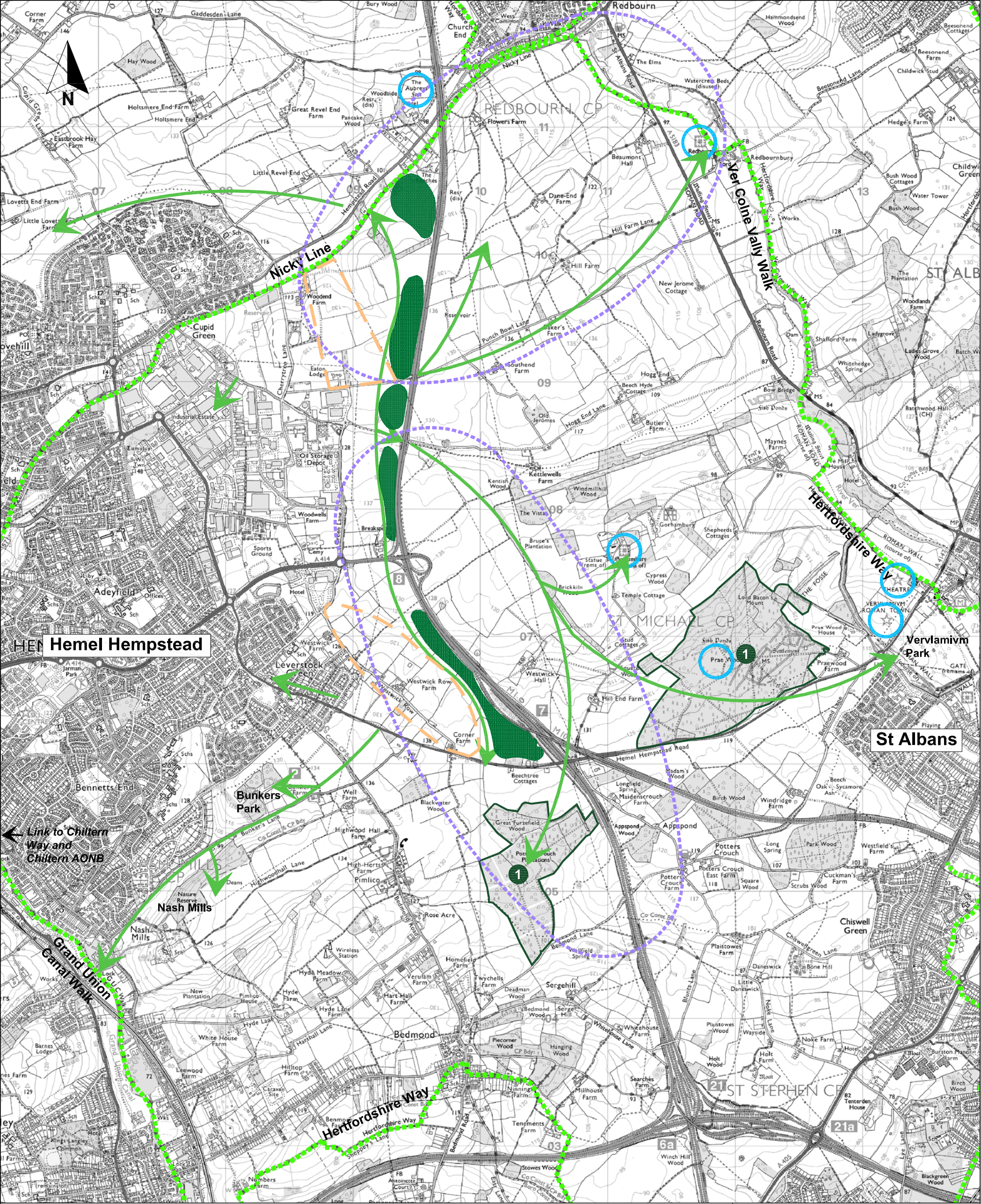
The Crown Estate
Gorhambury LDF Submission

Figure B9.2
Existing Informal Recreation and Public Access Provision - Local

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National Park / long distance route / recreational route/ National / regional cycle route

Potential green links

Potential to provide access to woodland

Potential site for new woodlands (with public access)

Potential short route 2km adjacent to residential areas

Potential medium distance route 6-8km

Place of interest

The Crown Estate
Gorhambury LDF Submission

Figure B9.3
Potential Opportunities for Informal Recreation and Public Access

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10. Noise and Air Quality

10.1 Introduction

This section of the report sets out the methodology used to look at issues relating to air quality and noise and sets out relevant constraints and opportunities. **Please note that this work was undertaken in 2001 and will be updated once new traffic data is made available.**

10.2 Air Quality Assessment

10.2.1 Scope

The air quality assessment undertaken had the following scope.

- Pollutants: NO₂ and PM10, since all others are either non-significant or, in the case of benzene, a conclusion has already been drawn based on all available data.
- Physical extent: Up to 200m from major road sources.
- Sources: From the scope of the physical extent, impact from traffic on the M1 and A414 has been assessed. Other roads are either too far away to have direct impact on the Concept site or will have an insignificant impact relative to these two sources.
- Year: Impacts have been assessed for 2025 which for the purpose of this assessment is the year that the Development is defined to begin, although depending on circumstances at the regional and local level, development could be substantially complete by 2025.
- Criteria: Impacts have been assessed against the Air Quality Objectives for NO₂ and PM10 listed in Table A4.1. The exposure criteria in terms of designating areas of exceedance for the Air Quality Objectives relate to all background locations where members of the public might be regularly present and exposed over the averaging period of the objective. For the annual mean objective this relates to building façades of residential properties, schools, hospitals and other public buildings. For the 24-hour mean PM10 objective, this is likely to extend to gardens of residential properties, while for the 1-hour mean NO₂ objective, this would also include kerbside sites of busy shopping streets and any other outside location where the public might reasonably be expected to have regular access, including the tube station.

10.2.2 Method

The Design Manual for Roads and Bridges (DMRB) model was used to predict impacts from road emission sources. Its output is suitable for assessment against the Air Quality Objectives. This model has been specifically developed to assess impact from vehicle emissions and takes into account relevant parameters which are distance



from source, background concentrations, vehicle flow rates, vehicle speeds, proportion of heavy goods vehicles and adjustments for the future year being assessed. Traffic flow rate and proportion of heavy goods vehicles data for both 1999 and 2025 were obtained from the traffic section of this report and from traffic data provided by DBC. Traffic speeds were assumed from knowledge of likely speed limits on the relevant sections of roads. The most relevant source of background air quality data for the location is the DBC report 3 and this has been used. Currently, guidance on adjusting background concentrations for future years allows extrapolation to 2015 and no further. Therefore, the predicted background levels in 2015 were used in the assessment.

The DMRB model results were validated using the 1999 DBC roadside monitoring results for the A414 and the Theale motorway roadside results. Validation allowed systematic model bias to be adjusted. The predictions for 2025 are therefore, representative of the specific Concept location based on the 1999 monitoring results and model validation.

10.3 Air Quality - Opportunities and Constraints

10.3.1 Opportunities

- Given The Crown Estate's extensive landholdings in the area, there is an opportunity to build stand off zones into the Concept at this stage in order to demonstrate compliance with relevant guidance.

10.3.2 Constraints

- As a result of the current Objectives and guidance on air quality management, residential areas are advised to be located beyond any possible exceedance zone, particularly in terms of the M1 and A414.
- Non-residential land uses including recreational uses are advised to be in the order of 50m from the M1 and 20m from the A414. The same distances can be broadly applied to residential development. The area in close proximity to the motorway could be planted but is unlikely to be suitable for public access.
- The likelihood of the Buncefield Oil Depot still operating in 2025 should be ascertained. If it is likely then an assessment of its impacts (in terms of minimum distances at which compliance with the Objectives relating to Benzene can be demonstrated) is advised.
- A detailed assessment of traffic impacts both from existing and proposed roads is recommended to accompany the finalised Concept design in 2025.
- It is advised that on going developments in air quality management in the UK will continue to be monitored for their impact on the Concept design. In particular, long-term aims of the EU and UK Government include the potential tightening of existing air quality standards.



10.4 Noise Assessment

10.4.1 Scope

Due to the site's location alongside the M1 motorway, it is significantly affected by road traffic noise. Other roads in the vicinity of the site will contribute to the overall noise climate, however, in terms of the residential areas in the design concept, it is the M1 which has the main impact and which has been the focus of this preliminary noise assessment.

10.4.2 Method

Entec has carried out noise predictions following the accepted methodology set out in the Calculation of Road Traffic document (CRTN, 1988). The aim of the work was to assess the need for a buffer zone alongside the M1 in order to protect residential amenity. The noise predictions have been calculated with the following assumptions:

- either soft ground or barrier attenuation - not both;
- barrier attenuation of 10dB which assumes the source is completely screened from the receptor using a barrier at the edge of the motorway;
- traffic flow data was obtained from the traffic study and the assessment years were 2001 (existing situation) and Year 2025 (assumed completion year, although as stated above, depending on circumstances at the regional and local level, development could be substantially complete by 2025); and
- traffic composition and traffic speed data was assumed from the available data and road speed limits.

10.4.3 Planning Policy Guidance on Noise

Planning Policy Guidance 24 Planning and Noise gives advice regarding planning considerations for noise sensitive development, e.g. housing, hospitals and schools. PPG24 presents Noise Exposure Categories (NEC) A-D which are described as follows.

NEC

- A Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as a desirable level.
- B Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise.



C Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.

D Planning permission should normally be refused.

Local Planning Authorities are guided by PPG24 (as well as other considerations) in terms of permitting noise sensitive development. For this assessment, it has been assumed that as a minimum, NEC C would be required. However, this does not necessarily mean that permission would be granted, even if mitigation measures were included.

For road traffic noise, the corresponding noise levels are:

Table B10.1 NEC Noise Levels for Road Traffic as LAeq,T dB

	A	B	C	D
07:00-23:00	<55	55-63	63-72	>72
23:00-07:00	<45	45-57	57-66	>66

10.4.4 Results

The assessment has considered the potential impacts of noise from the M1 affecting proposed residential areas within the Gorhambury site. The results of the noise predictions are given in Table B10.1 as L10, 18 hour. In order for the results to be compared with the appropriate Noise Exposure Category from PPG 24 they have been converted to an LAeq,16 hour as set out in the PPG. These results are given in Table B10.2.

Table B10.2 Results of Traffic Noise Predictions, as LA10 18 hour

Road Section	Scenario	LA10 dB at Distance from M1					
		50m		100m		150m	
		Yr 2001	Yr 2025	Yr 2001	Yr 2025	Yr 2001	Yr 2025
M1 J7-8	L10, 18 hour with soft ground	76.4	77.3	73.0	73.9	69.8	70.7
	L10, 18 hour with barrier	70.4	71.3	67.5	68.4	65.8	66.7
M1 J8-9	L10, 18 hour with soft ground	75.9	76.8	72.5	73.4	69.3	70.2
	L10, 18 hour with barrier	69.9	70.8	67.0	67.9	65.3	66.2



Traffic flow will increase with or without the scheme and the worst case situation based on the average of high and low traffic growth factors has been assessed. As can be seen from the table, a barrier would give greater noise attenuation than reliance on soft ground absorption. However, this would need a substantial length and height of barrier in order to provide at least 10dB attenuation. This could be improved by increased height of barrier, but will also depend on local topography and building height.

The noise levels in Table B10.1 have been converted to approximate 16 hour LAeq's as detailed in PPG24 (i.e. by subtraction of 2dB) and rated according to the PPG24 NECs for traffic noise. The results are given in Table B10.3.

Table B10.3 Noise Levels as LAeq,16 hours showing PPG 24 Noise Exposure Categories (no road surface correction)

Road Section	Scenario	L _{Aeq} , 16 hour dB at Distance from M1					
		50m		100m		150m	
		Yr 2001	Yr 2025	Yr 2001	Yr 2025	Yr 2001	Yr 2025
M1 J7-8	Leq, 16 hour with soft ground	74.4 D	75.3 D	71.0 C	71.9 C	67.8 C	68.7 C
	Leq, 16 hour with barrier	68.4 C	69.3 C	65.5 C	66.4 C	63.8 C	64.7 C
M1 J8-9	Leq, 16 hour with soft ground	73.9 D	74.8 D	70.5 C	71.4 C	67.3 C	68.2 C
	Leq, 16 hour with barrier	67.9 C	68.8 C	65.0 B	65.9 B	63.3 B	64.2 B

Due to the higher traffic flow on the section between Junctions 7 and 8, the traffic noise levels are higher for this section of the site, i.e. to the south of Junction 8. It is considered that the area within 50m of the motorway would not be developable without a barrier as it would fall within NEC D.

No correction has been made for the effect of the road surface itself, as the type of surface material is not known. However, for impervious surfaces 1dB(A) should be subtracted and for pervious road surfaces 3.5dB(A) should be subtracted. Applying a road surface correction would further reduce the predicted noise levels. In order to demonstrate how this could affect the NECs for Gorhambury, the predictions have been revised by assuming a further 3.5dB correction for a pervious road surface. The results are given in Table B10.4.

Table B10.4 Revised Noise Exposure Categories for Gorhambury site with road surface correction

Road Section	Scenario	L _{Aeq} , 16 hour dB at Distance from M1					
		50m		100m		150m	
		Yr 2001	Yr 2025	Yr 2001	Yr 2025	Yr 2001	Yr 2025
M1 J7-8	Leq, 16 hour with soft ground	70.9 C	71.8 C	67.5 C	68.4 C	64.3 C	65.2 C
	Leq, 16 hour with barrier	64.9 C	65.8 C	62.0 B	62.9 B	60.3 B	61.2 B
M1 J8-9	Leq, 16 hour with soft ground	70.4 C	71.3 C	67.0 C	67.9 C	63.8 C	64.7 C



Road Section	Scenario	L _{Aeq} , 16 hour dB at Distance from M1					
		50m		100m		150m	
		Yr 2001	Yr 2025	Yr 2001	Yr 2025	Yr 2001	Yr 2025
	Leq, 16 hour with barrier	64.4 C	65.3 C	61.5 B	62.4 B	59.8 B	60.7 B

10.5 Noise - Opportunities and Constraints

10.5.1 Opportunities

- For planning purposes, residential development is categorised as a noise sensitive development, as are schools. Employment related uses are not categorised as noise sensitive.
- A preliminary desk top appraisal of noise associated with the M1 Motorway has been carried out. For the purposes of the appraisal we have assumed that a barrier at the edge of the motorway is provided, giving at least 10dB attenuation and that the motorway surface is pervious. On this basis the majority of the site falls within daytime noise exposure category B (as defined in PPG24 Planning and Noise). Where sites fall within this category PPG24 (Planning and Noise) states that noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise. Closer to the motorway and with only soft ground attenuation, the site would be classed as NEC C or D.
- In addition it is not unreasonable to assume that further advances in tyre technology and improvements to road surfacing will lead to further reductions in noise. Such improvements are likely to be driven by legislation at the European level.

10.6 Constraints

- It will need to be demonstrated that noise will not impact on the suitability of Gorhambury as a location for development.
- In relation to noise a 100 metre stand off zone from the M1 for residential areas should be provided for in the concept at this stage. For less sensitive employment areas, a stand-off of 50m is proposed. The zone could be utilised for recreational purposes - with account taken of the stand off zone relating to air quality (i.e. land within 50m of the motorway could not be used for recreational purposes but the land 50-100m away could be).

10.7 Conclusions

Given the proximity of part of the proposed development to the M1 motorway, air quality and in particular noise issues are a key influence on the design of the proposals. However, the scale of The Crown Estate's landholdings



at this location is an advantage in that there is opportunity to plan for buffer zones and stand off zones which will minimise noise impacts. Employment development is proposed in the central part of the proposed development which is closer to the M1. The proposed development Concept takes into account the need for buffers to the M1 for different land uses. Further assessment will be undertaken once updated traffic data is available. This will also take into account improved technology, such as new road surfaces which reduce noise, and which may now be in place as a result of the M1 widening works.





Creating the environment for business



11. Buncefield Oil Depot and Associated Pipelines

11.1 Introduction

The purpose of this chapter is to consider issues relating to the proximity of the proposed development site to the Buncefield Oil Depot. This considers the existing planning policy advice and consultation distances relating to the Depot and sets out details of the revised guidance that will be introduced in 2008. This chapter also sets out details of the pipelines associated with Buncefield, although full details can be found in chapter 8 on infrastructure and utilities.

11.2 Buncefield Oil Depot and Consultation Distances

Figure B11.1 (source: Health and Safety Executive (HSE)) shows the existing consultation zone around the Buncefield Oil Depot. Within this zone HSE recommends against certain land uses, although a number of uses are still appropriate.

In Summer 2007, HSE consulted on two papers, as follows:

- CD211 “Proposals for revised policies for HSE advice on development control around large-scale petrol storage sites”; and
- CD212 “Proposals for revised policies to address societal risk around onshore non-nuclear major hazard installations”.

The first of these papers proposed a series of options involving possible amendments to consultation distances and the uses proposed within them. The maximum distance that it was proposed the consultation distance could be extended to was 400 metres (more than twice the current distance). The second consultation paper considered issues associated with societal risk, and the risks associated with large numbers of people being in close proximity to facilities such as Buncefield.

The responses to this consultation have now been reviewed and HSE has decided to go ahead with Option 4 as set out in the Consultation document. Option 4 involves changing the size of Consultation Distance informed by risk and adopting a new Development Proximity Zone to give more restrictive advice. This would extend the consultation distance and planning zones around the depot, with the Outer Zone extending to 400m and introduce a new ‘Development Proximity Zone’ (DPZ) with increased sensitivity levels. These zones are shown in Figure B11.2. The new DPZ would be at a radius of 150m from the site. Within this zone HSE would advise against new development other than that involving not normally occupied structures. The new consultation zone will come into effect in Summer 2008. HSE recognises that further research will be undertaken into what took place at Buncefield and land use planning advice may be reviewed again if appropriate.



A very limited area of The Crown Estate's overall landholding is directly affected by the current consultation zones, and a large part of the site is some extensive distance away from the depot. The proposals and Concept that is set out as part of this document takes into account the maximum possible new consultation zone distance as proposed in the CD211 Consultation Paper (400m) and now accepted as the new consultation zone, to come into effect in summer 2008. It is important to bear in mind that even within the consultation distance, particularly in the outer zone, a number of land uses are acceptable. This is illustrated in Part D of this document which sets out possible land uses for different parts of the proposed development site. For instance, parts of the consultation zone can be used for small scale employment, car parking areas and landscaping.

If the Depot is to remain in situ and start operating again as before the fire, then it is important that the best use is made of land in this part of Hemel Hempstead. This will enable regeneration of the area, so that the whole environment can be improved and new investment can be encouraged, both to the Maylands area and to any associated new development to the east of Hemel Hempstead.

In addition to the increased safety measures to be implemented at the Oil Depot (following Buncefield additional safety measures are to be implemented at all such sites), there are other measures that can be incorporated in the vicinity of the Depot. For instance additional walls can be built and earth banks can be a way of shielding the area beyond the site. They also have the effect of mitigating noise and visual impacts. However, a number of these measures would need to be undertaken on site by the site operators. Any new buildings in the vicinity of the Depot could be specifically designed to minimise the impact of any future incident, although it is recognised by the Buncefield Investigation Board in its response to the HSE consultation that the likelihood of a similar explosion was low and could be made lower still be a programme of actions designed to increase the reliability of primary containment.

Any design measures introduced would be specific to the site and land use, but could for instance incorporate measures such as extended buffer zones, locating less sensitive uses such as storage, limited use of glass facing the Depot, buildings situated site on rather than end on to the depot and in buildings very close to the depot floor supports can be strengthened.

Therefore whilst the Buncefield fire will clearly influence future use of land to the east of Hemel Hempstead, it should not in any way be a restriction on development to the east of the town, particularly given the distance of much of The Crown Estate's land from Buncefield. Development to the east of the town is in fact likely to act as a catalyst to development in this area through environmental improvements and investment in and provision of new infrastructure.

11.3 Pipelines Associated with Buncefield

There are three pipelines associated with the Oil Depot which run through the Gorhambury area, although one of these runs parallel with the M1 so has little impact on the proposed development south of the A414. Please see Figure B8.1 (chapter 8, after page B129) for the location of the pipelines. These are multi product pipelines which carry refined petroleum products at pressure up to 1500psi. The pipelines are laid at a nominal depth of 1 metre



across open countryside. They are protected at existing road crossings by concrete protection slabs. There is an easement width of three metres either side of each pipeline. There is also a 'construction and maintenance' strip, which is 20 metres in width, although this does not impose any restrictions upon the landowner. Within the three metre easement no building or tree planting can take place. The British Pipeline Agency (BPA) has advised that this easement area can be used as linear parkland, amenity areas, footways, cycle paths and car parking. Roadways are permitted within the easement, although additional protection for the pipelines would be required if roadways are built.

The Buncefield Investigation Board, in its response to the HSE Consultation Paper CD212 (reference above) noted that an anomaly is that major pipelines carrying gasoline are not subject to land use planning controls. Pipelines carrying gasoline are subject to the Pipelines Safety Regulations (1996), but are excluded from additional duties for pipelines conveying fluids with a major accident hazard potential.

As part of the deed of grant relating to the pipelines crossing The Crown Estate's land there is some provision for diverting sections of pipeline onto other areas of Crown Estate land. Therefore if necessary, there is the possibility that sections of pipeline could be diverted away from the proposed development.

11.4 Conclusions

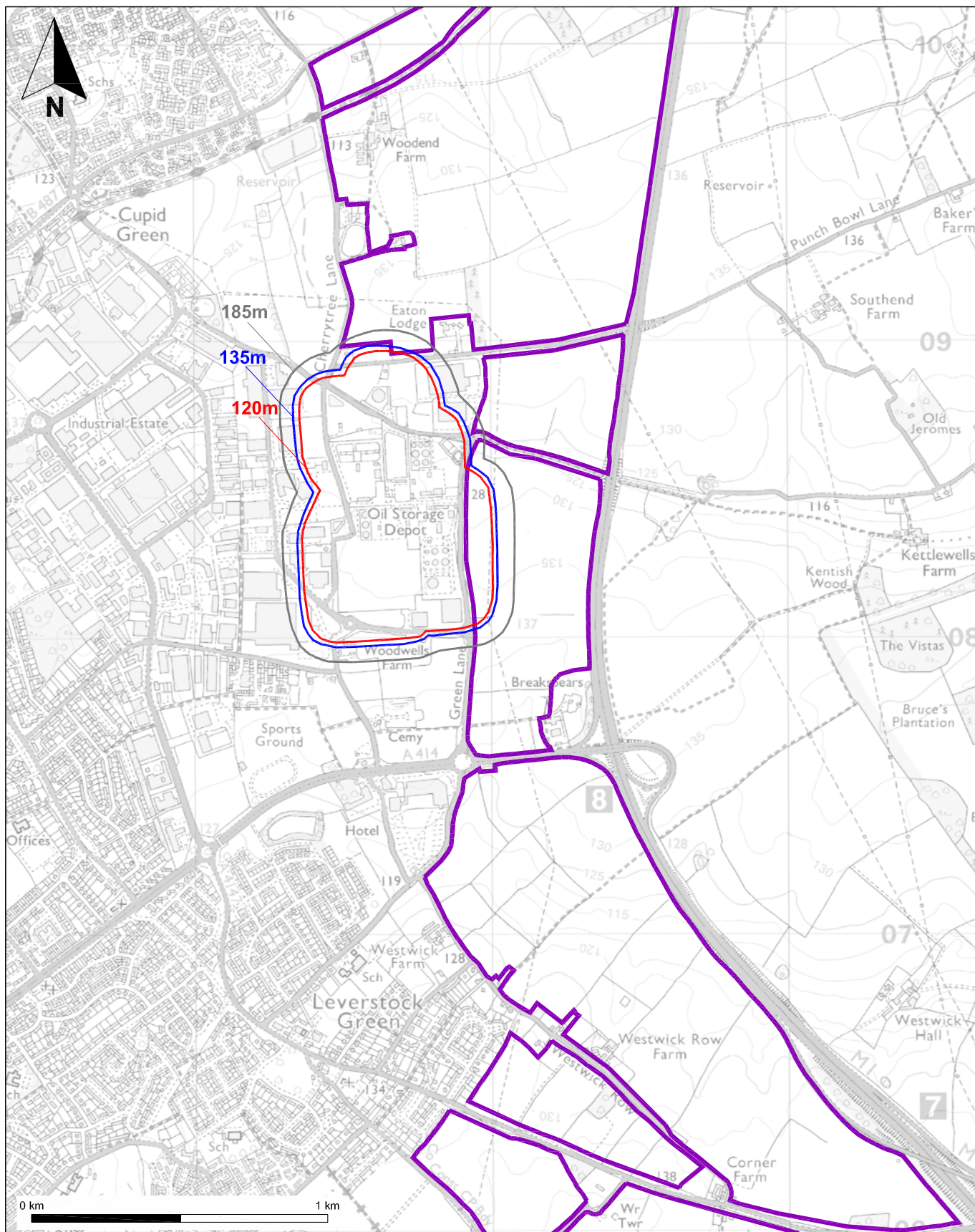
The Gorhambury Concept proposals as set out in this document take into account the new consultation distance that HSE has recently decided will form the basis of its revised planning guidance, to be applied from summer 2008. Given the scale of the proposed development area, a limited area of The Crown Estate's land is affected by this revised consultation zone as a large part of the site is some extensive distance away from the Oil Depot. Therefore, whilst the presence of the Oil Depot will clearly influence future use of land to the east of Hemel Hempstead, the presence of the Oil Depot should not be used to restrict development to the east of the town, particularly given the distance of much of The Crown Estate's land from Buncefield and the opportunities that exist for environment improvement and regeneration in this part of the town.





Creating the environment for business





Key

- Inner Zone
- Middle Zone
- Outer Zone
- Crown Estate's Land Ownership West of the M1

The Crown Estate
Gorhambury LDF Submission

Figure B11.1
Existing HSE Consultation Zone and
The Crown Estate's Land Ownership

Source of Zones: HSE (Feb 07)

November 2007
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12. Conclusions

This Part B of the document has set out the baseline information and identified key opportunities and constraints associated with each of the main topic areas. This forms part of the evidence base for taking forward proposals for development to the east of Hemel Hempstead. It has also informed development of the proposals set out in Part D of this document.

The key conclusion from these baseline assessments is that there are no major constraints to development at this location and there are considerable opportunities for enhancement and mitigation associated with the proposed development which would provide benefits to local residents for instance in terms of infrastructure provision and wider environmental benefits. There are no major environmental designations, no flood risk constraints and no access constraints. This technical work demonstrates that the land to the east of Hemel Hempstead is a logical and sustainable location for growth and that this area should be carried forward in the relevant Development Plan Documents as the preferred location for growth at Hemel Hempstead.

A summary of the key issues identified within each topic area is set out below.

Employment and Socio-Economics: This baseline review of information relating to the economy of Hemel Hempstead and local property market in the Maylands area shows that the residents of Dacorum are relatively prosperous, particularly in terms of skills and entrepreneurship. In the office market it is particularly a shortage of quality space that is an issue. There has however been slow take up of office space in Hemel Hempstead in recent years. Therefore a joint approach to working with nearby proposed developments at Maylands is recommended. The proposed development should build on the proximity of Maylands by seeking to extend a new high quality office environment, creating a high profile and attractive Gateway site off the M1. This will also assist in improving the environment of Hemel at the key gateway off the motorway junction and diversifying the mix of land uses in the area.

Community Facilities: This assessment identifies the availability and accessibility of key services and community facilities in and around the proposed development area. This concludes that Hemel Hempstead is generally well served with large facilities, although there is a recognised need for a new town stadium. There is potential to incorporate such a stadium as part of the proposals for eastern Hemel Hempstead. Locating a stadium in the Gateway to Hemel Hempstead would assist in increasing the profile of the town. Due to the elongated nature and size of The Crown Estate's land to the east of Hemel Hempstead, a number of local community services and facilities will need to be provided for the new population. Facilities such as primary schools, local shops, post offices, doctor's surgeries, community centres and possibly a secondary school or extension to existing secondary schools would be required to ensure that the new residents are within reasonable walking distance of key facilities and to ensure that pressure is not placed on existing facilities. Such facilities would be provided in the neighbourhood centres and would not only benefit new residents but could also be used by the existing population. There are also opportunities to provide for other facilities that will not only benefit the new community, but also the existing community.



Landscape and Visual Context: This assessment shows that the proposed development area has several characteristics of urban fringe areas heavily influenced by the detracting presence of urban elements including large/small scale industrial/commercial development along the eastern edge of Hemel Hempstead, the M1, overhead transmission lines and pylons, and fly-tipping.

Opportunities for advanced planting in addition to that already undertaken by The Crown Estate are identified as this will assist in setting a more established landscape framework and in screening existing negative visual elements, such as the M1 corridor in advance of development. It will allow individual phased development to be introduced upon sites with an established framework e.g. shelterbelts, wildlife corridors, small woodlands. There are opportunities to improve and plant up hedgerows, many of which are very gappy.

Transport: This initial policy review provides the policy context including details of the Hemel Hempstead Urban Transport Plan that Dacorum Borough Council and Hertfordshire County Council are producing. This also sets out the initial response of the Highways Authorities to potential development at Gorhambury, which confirmed that there are currently no transport models for Hemel Hempstead and existing data is considered too old for meaningful analysis. Therefore new data will be required for more detailed work associated with the transport implications of any urban extension to the town. Based on the limited data available and initial assessment of the maximum potential traffic impact of the development has been undertaken. This is in effect a 'worse case scenario' and we would anticipate a minimum 20-25% reduction in these as a result of the sustainable transport measures proposed.

Historic Environment: This assessment has considered the opportunities and constraints associated with the historic environment. There are no Scheduled Ancient Monuments, Conservation Areas, Registered Historic Parks and Gardens or Registered Historic Battlefields within the Concept Area. There are a number of Grade II Listed Buildings, primarily agricultural buildings and three non-statutory Local Plan designations (Areas of Archaeological Importance) are located within or in the immediate vicinity of the Concept Area. In particular there are opportunities to respond positively to the residual elements of the medieval settlement and field patterns around Westwick Row which can be reflected in the new development. The assessment also looks at the wider historic environment beyond the proposed development area, to the east of the M1 as there are opportunities to utilise this area to the benefit of local residents. This chapter also recognises the need to anticipate potential further archaeological remains and to anticipate the need for a phased archaeological programme at the detailed stage.

Ecology: The arable farmland forming the majority of the Estate is of negligible nature conservation importance. The key features in the proposed development area are woodlands and hedgerows, which are particularly found in the southern part of, and to the south of the proposed development area. These key features would be incorporated within the proposed development as far as possible. The site provides potential habitat for a number of protected species, and surveys for these would need to be undertaken at the more detailed planning stages. There are a number of opportunities for mitigation or compensation and biodiversity enhancement both within the proposed



development area and the land within The Crown Estate's ownership to the east of the M1 which is not proposed for development.

Infrastructure and Utilities: This section identifies the location and extent of existing services in and around the vicinity of the site. There is one overhead 400kV transmission line within the proposed development area. Development can be planned around this, and Part D of this document refers to National Grid's guidelines on design around overhead lines. There are two British Pipeline Agency oil pipelines and one Total operated pipeline in or in the immediate vicinity of the site. No development will be permitted within the easement corridor of these. If necessary, these pipelines or parts of them can be diverted to elsewhere on The Crown Estate's land. Discussions with Three Valleys Water Plc confirmed that water resources are scarce in the Gorhambury area, and that it intends to focus its efforts on demand management measures and a small aquifer storage and recovery scheme. The development site is not within an area at risk of fluvial or tidal flooding (as defined by the Environment Agency's flood risk maps). However, a flood risk assessment will be required at the appropriate planning stage to demonstrate how runoff will be managed and how drainage solutions will be implemented.

Informal Recreation and Public Access: This section provides an overview of existing informal recreation and public access provision in eastern Hemel Hempstead and an indication of local recreational needs. It goes on to identify potential opportunities for informal recreation and public access associated with the proposed development. This is likely to involve utilising what already exists, for instance creating circular footpath/cycle routes of different lengths, more accessible routes, routes that link settlements and link up with the existing network and that provide access to key attractions/facilities to the east of the M1. There are a number of opportunities to enhance the green infrastructure in the locality, and to enhance links for the new and existing population to the open countryside and to areas of woodland.

Noise and Air Quality: An air quality assessment has been undertaken previously and advises that residential areas should be located beyond a certain distance from the M1 and A414 and that there are opportunities for planting up these buffer areas. Given The Crown Estate's extensive landholdings in the area, there is an opportunity to design these stand off zones into the Concept at this early stage to ensure that the proposed development will be compliant with the relevant guidance. In relation to noise, at this stage it is recommended that a 100 metre stand off zone be identified from the M1, and for less sensitive employment uses, a stand-off of 50 metres is proposed. Further more detailed assessments would be required at planning application stage, as there could be reductions in noise associated with further advances in tyre technology and also improvements to road surfacing. Further assessments are also required to up date the work that was undertaken in 2001 and to take into account the latest traffic data.

Buncefield Issues: A very limited area of The Crown Estate's proposed development land is directly affected by the consultation zones around Buncefield, and a large part of the site is some extensive distance away from the Depot. The proposals and Concept that is set out as part of this document takes into account the new consultation zone distance that HSE will put in place in summer 2008. It is important to bear in mind that even within the consultation distance certain land uses are acceptable.



If the Depot is to remain in situ and start operating again as before the fire, then it is important that the best use is made of land in this part of Hemel Hempstead to act as a catalyst for regeneration of the area, so that the whole environment can be improved and new investment can be encouraged, both to the Maylands area and to any associated development to the east of Hemel Hempstead.

With regard to the pipelines associated with Buncefield development can be planned around these and as noted above there is the possibility of diverting parts of these lines to elsewhere on The Crown Estate's land.

No major constraints to development have been identified, and a number of opportunities have been identified which offer potential enhancement to the existing environment, such as opportunities associated with provision of new community facilities, new landscaping and areas of open space/recreational space and new recreational links, ecological enhancement, enhancing links to existing historic resources, and new measures to encourage use of sustainable transport. These opportunities are taken forward in Parts C and D of this document. The evidence base of technical work set out in this Part should be used by the local authorities in making decisions on the most appropriate direction for growth at Hemel Hempstead.



Appendix A

Preliminary Archaeological Appraisal

Introduction

Cultural heritage is represented by a wide range of features, both visible and buried, that result from past human use of the landscape. These include standing buildings, many still in use, sub-surface archaeological remains and artefact scatters. It also includes earthwork monuments as well as landscape features such as field boundaries and industrial remains.

The importance of cultural heritage remains is recognised in both legislation as well as national and local policy. Certain features that are deemed to be of particular importance are given legal protection through the Ancient Monuments and Archaeological Areas Act 1979 (Scheduled Ancient Monuments), and through planning legislation (Listed Buildings). Further advice on how cultural heritage should be treated is given in Planning Policy Guidance Notes (PPGs) 15 and 16. PPG15 deals with the historic environment, including listed buildings and conservation areas whilst PPG16 deals with archaeology. PPG16 describes archaeological remains as a finite and non-renewable resource that should not be thoughtlessly or needlessly destroyed.

The presence of cultural heritage features is a consideration in determining planning applications, and early consultations with the local authority are encouraged in planning guidance. Where there is a reason to believe that cultural heritage features may be affected by a development proposal then the first step is often the preparation of a desk-based assessment. This involves the collection of existing information that can assist in the assessment of the likely or potential impact of the development.

Site-based investigations may subsequently be required to clarify further the nature and extent of identified features. This is termed archaeological evaluation and includes field walking, geophysical survey and limited area excavation. The County Archaeologist may request that such investigations are carried out prior to determination of a planning application if there is insufficient information available from desk-based research to allow an ‘informed and reasonable’ decision to be reached.

Scope

In completing a desk-based assessment of the effects of any development on cultural heritage it is crucial to define the known and potential nature of features that may be involved. This requires consideration of a number of factors.

- Development can affect features of cultural heritage interest not only through direct impacts (e.g. land take) but also indirect impacts, such as the setting of monuments.



- Desk-based assessment involves a review of current information only and there may be further features within the site that are not yet known. The potential for this may be assessed from the conditions of the site, features within the wider area and a history of land use within the site.
- Not all cultural heritage features are considered of equal 'importance' and it is important to identify the significance of the features. This is done through reference to legislation, policy guidance and professional judgement.

Direct Effects

Information is required on any features that are known to be or could potentially be within the area directly affected by the proposed development. This includes the footprint of both the built area and those to be landscaped and managed as part of the overall scheme. To this end the following sources were consulted:

- Sites and Monuments Record (a county based register of known archaeological and historical sites);
- cartographic and historic documents;
- aerial photographs;
- place and field name evidence; and
- published sources.

These were obtained from the following organisations:

- Hertfordshire Sites and Monuments Record;
- Hertfordshire Archives and Local Studies; and
- English Heritage (National Monuments Record).

The assistance of these bodies is gratefully acknowledged.

The Sites and Monuments Record is a summary of the known information on archaeological sites and finds locations within the county. It should therefore not be regarded as a comprehensive record, as its content relies on previous desk-based and field investigation.

A site visit was also made in order to view known sites of potential significance and to assess the general ground conditions.



Indirect Effects

Indirect effects on features of cultural heritage interest can occur as a result of significant changes to the setting of a feature, whether permanent or temporary. Based on national policy guidance, this is normally considered more relevant to designated features of national importance, such as Scheduled Ancient Monuments and Listed Buildings.

Registers of designated sites within the surrounding area have been reviewed, and these show that there are no designated cultural heritage features within the site. There are also no designated cultural heritage features within the surrounding areas that it is considered could potentially be indirectly affected by the proposed development. No further assessment of indirect effects has therefore been undertaken.

Baseline Description

Designated Features

Scheduled Ancient Monuments

There are no Scheduled Ancient Monuments (SAMs) within the site. There are two that are within the immediate vicinity:

Table A.1 **Scheduled Ancient Monuments within the vicinity of the site**

Entec No.	SAM No.	Grid Ref.	Name/Description
1	SAM 27921	TL 08240786	Romano-Celtic temple complex at Wood Lane End
2	SAM Herts 2	TL 09501120	The Aubreys. Fort

There are further SAMs to the east of the site and in the vicinity of St. Albans. These are within an important complex of archaeological sites centred on the Roman town of Verulanium and the Iron Age settlement at Prae Wood.

Listed Buildings

There are a number of listed buildings (all Grade II) within the site, all of which are farm buildings dated from the medieval period to the nineteenth century. They are:



Table A.2 **Listed Buildings within the site**

Entec No.	Grade	Grid Ref.	Name/Description
3	II	TL 09760611	Corner Farmhouse
4	II	TL 09760611	Corner Farm. West range of outbuildings
5	II	TL 09760611	Corner Farm. North and east range of outbuildings
6	II	TL 09760611	Corner Farm. South and east sides of east yard
7	II	TL 09350662	Westwick Row Farmhouse
8	II	TL 09360658	Westwick Row Farm. Range of barns on south side
9	II	TL 09210669	King Charles II Cottage
10	II	TL 09080663	Westwick Cottage

In addition, there are further listed buildings within the immediate vicinity of the site:

Table A.3 **Listed Buildings within the immediate vicinity of the site**

Entec No.	Grade	Grid Ref.	Name/Description
11	II	TL 10001100	Flowers Farmhouse
12	II	TL 09501112	Restaurant at Aubrey Park Hotel
13	II	TL 10240600	No 1 Beechtree Cottages

Hertfordshire Sites and Monuments Record

The following features are recorded on the Hertfordshire SMR from within the site:

Table A.4 **Features recorded on the HSMR within the site**

Entec No.	HSMR	Grid Ref.	Name/Description
14	2552	TL 09350662	Site of Blackwater Farm
15	602	TL 09300650	Bronze hoard, found c. 1927
16	9038	TL 0902207445	Cropmark of circular enclosure
17	9042	TL 0902607148	Cropmark of linear feature



Entec No.	HSMR	Grid Ref.	Name/Description
18	4595		Hemel Hempstead Road. Possible Roman road
19	9739	TL 08790735	Earthworks on site of Bottom House Farm
20	9623	TL 09650624	Possible site of tithe barn
21	9741	TL 09690629	Possible house site, possibly a manor
22	9740	TL 0906	Possible site of manor of Markyate
23	9742	TL 09050653	Prehistoric flint scatter
24	6823	TL 094077	Possible Roman building, evidence found during M1 construction
25	9043	TL 09210817	Cropmarks of linear parallel features. Probably modern
26	9045	TL 0925508932	Cropmarks of a circular enclosure. Possible roundbarrow
27	9046	TL 0953110558	Cropmarks of linear features. Possible former field boundaries
28	9643	TL 096072	Medieval and RB finds. Geophysical survey negative.
29	9664	TL 08330982	Site of Quaker meeting house and burial ground
30	8909	TL 08861000	Former railway line. The Nicky Line.
31	10357	TL 09020615	Crop/soilmark of a linear feature. Possible road.
32	10535	TL 08810697	Westwick Farm. Site of Tudor farmhouse
33	10536	TL 08820700	Westwick Farm. Two farm buildings possibly of C17 origin
34	10537	TL 08860695	Westwick Farm. Linear depression visible on APs
35	9548	TL 09470570	Trackway. Possible Roman road
36	10358	TL 09230577	Cropmark of a linear feature. Possible road

In addition, there are further HSMR recorded sites within the immediate vicinity of the site:

Table A.5 Features recorded on the HSMR within the immediate vicinity of the site

Entec No.	HSMR	Grid Ref.	Name/Description
37	4789	TL 103059	Rectangular cropmark features
38	6824	TL 08120786	Watching brief. Roman features found
39	9203	TL 08370797	Archaeological evaluation. LBA/IA occupation evidence
40	9204	TL 08210799	Archaeological evaluation. RB field system and occupation evidence
41	9205	TL 08430800	Archaeological evaluation. Medieval ridge and furrow found
42	9622	TL 08980678	Archaeological evaluation. RB building materials found in ditch
43	9625	TL 09751000	Watching brief. RB ditch found
44	9641	TL 09550945	Medieval pottery found. Geophysical survey negative.
45	9647	TL 09490887	Slag found. Possible smelting site
46	1818	TL 109067	Supposed shrunken medieval village. Considered doubtful.
47	9037	TL 10380577	Cropmarks of a linear feature. Possible road or track



Aerial Photographs

A search was made at the air photo library (specialist collection) within the National Monuments Record, Swindon for any oblique aerial photographs showing potential archaeological features within the site. This collection holds no photographs of land within the site.

Aerial photographs showing potential archaeological features are held by the Hertfordshire Sites and Monuments Record.

Documentary Sources

Published Sources

Published and historic cartographic sources were consulted at the Hertfordshire Archives (HA) and Local Studies Library. The results of documentary searches conducted during previous cultural heritage assessments have also been used.

The site is located within the historic parishes of Redbourn in the north, and St. Michaels in the south. Both parishes have similar land ownership histories, being substantially owned by St. Albans Abbey up to dissolution and then eventually coming in to the possession of the Grimston family. In 1815 James Walter Grimston was made the Earl of Verulam.

The Manor of Redbourn is recorded as being given to St. Albans by Aethelwine and Wynfleda during the reign of Edward the Confessor. It was later confirmed as a possession of the Abbey by Kings Henry II and John and held until the dissolution in 1539.

In 1550 the manor was granted to Princess Elizabeth, who as queen leased the manor and demesne lands to Richard, Jane and Elizabeth Rede. It passed through various hands before sold in 1652 to Sir Harbottle Grimston, from whom it descended to the Earl of Verulam.

The Manor of Westwick, in the parish of St. Michaels, was bequeathed by Aethelgifu to St. Albans Abbey in 942-6, and later confirmed by King Ethelred in 996. During the eleventh and twelfth centuries a succession of Abbots took the manor away from the Abbey and granted it to laymen. Abbot Paul (1077-93) granted it to Humbald for life, though it reverted to the Abbey on his death. Abbot Geoffrey de Gorham (1119-46) built a hall at Westwick and granted this with lands to a kinsman called Hugh, probably the son of Humbald. This grant was made without the consent of the monks and in an understandable act of gratitude Hugh changed his name to 'de Gorham'. This grant was later confirmed by Abbot Robert de Gorham (1151-66) and the manor remained with various branches of the de Gorham family until the early fourteenth century.

In 1307 Westwick was inherited by Alphonsus de Vere who passed in on to his son John. John's grandson Robert became a cousin by marriage of Richard II and was granted a number of honours including being made the Duke of



Ireland in 1386. However, he soon became the victim of political intrigue and was denounced as a traitor, forfeiting all his lands to The Crown.

St. Albans Abbey recognised the opportunity to regain the manor, and did so at a cost of 800 marks. Following this re-acquisition, it remained with the Abbey until the dissolution of 1539, when the manor reverted to The Crown.

Henry VIII granted the manor to Ralph Rowlett in 1540, and it passed through various hands before being acquired by Sir Nicholas Bacon in 1560. The Victoria County History records that he pulled down the existing hall of Geoffrey de Gorham and built Gorhambury House, completing this in 1568.

Sir Nicholas was succeeded by Anthony Bacon in 1579 and then Sir Francis Bacon, who rose to Lord Chancellor by 1618 and was made Baron Verulam and Viscount St. Albans. The manor descended in the Bacon family before being sold in 1652 to Sir Harbottle Grimston and subsequently remained in the same ownership as Redbourn, similarly descending to the Earl of Verulam.

The location of Gorhambury House built by Sir Nicholas Bacon is not in doubt. It is illustrated on an estate plan of 1634 and the remains are located near to the current house. The fate and location of the earlier hall, built by Geoffrey de Gorham are less clear. The Victoria County History records that this was demolished by Sir Nicholas Bacon in the 1560's, and implies that it was somewhere near to Gorhambury House. However, some recent researches have proposed an alternative. This locates the original Westwick manor house, together with a tithe barn on Westwick Row, being demolished around the 1630's. It is suggested that this house served as a demesne farm following the construction of Gorhambury House in 1568, but was allowed to run down and was demolished to be replaced by Westwick Hall in the early 17th century.

There is no clear cartographic evidence to prove either suggestion and the latter argument is based on inferences from the written Gorhambury Records. It does not appear likely that either case can be conclusively proved on the basis of historical evidence alone.

Historic Cartographic Sources

The earliest known map to include land within the site is a 1634 map of the Gorhambury estate (HA D/EV P1), when it was still in the possession of the Bacon family. The estate was quite limited in extent at this time, in comparison to the much larger estate later established by Harbottle Grimston, and only a limited amount of land within the site is shown. This shows enclosed fields, together with a house alongside a small length of Westwick Row at the western extremity of the estate.

It has been suggested that this house is the twelfth century Manor house built by Geoffrey de Gorham. It is worth noting that this was the only house shown on this map, other than Gorhambury House itself, and that Westwick Hall had not yet been built.



The next estate map shows a considerably enlarged estate held by the Grimston family in 1766 (HA D/EV P2). This shows not only land to either side of the length of Westwick Row, but also all land within the site that is in Redbourn.

The map shows a number of cottages along Westwick Row, some of which are still present, but most of which are not. It also shows field boundaries and names. The pattern of field boundaries is the same as shown on the OS map of 1899, though some had been removed by this time. Land to the north-east of Westwick Row is shown as being accessed through a series of lanes.

Within Redbourn a farm is shown at the currently occupied site of Woodend Farm. Land immediately to the north of this (named as Cross Lanes Orchard) is shown as being occupied by two cottages. By 1899, the southern of these cottages had gone. No other buildings are shown as present within the site.

Tithe maps were prepared for St. Michaels (HA DSA 4/87/1-2) and Redbourn (HA DSA 4/79/1-2) in 1843 and these show only limited changes from the earlier estate plan. Westwick Row continued to be occupied, with a number of cottages along its length and the field boundary pattern remained largely unchanged. Within Redbourn two farms called Cherrytree Farm are shown. The northern of these continued to be called Cherrytree Farm and is within the site, whilst the southern one was later called Three Cherrytrees Farm and is outside the site.

Table A.6 Features identified from documentary sources not recorded on the HSMR

Entec No.	Grid Ref.	Name/Description	Source
48	TL 08830698	Site of cottage	HA DSA 4/87/1-2
49	TL 09450655	Site of cottage	HA DSA 4/87/1-2, HA D/EV P2
50	TL 09630631	Site of cottage	HA DSA 4/87/1-2, HA D/EV P2
51	TL 09860607	Site of cottage	HA DSA 4/87/1-2
52	TL 09450645	Site of cottage	HA DSA 4/87/1-2
53	TL 08680719-TL 08810752	Parish boundary, marked by hedgerow	HA DSA 4/87/1-2
54	TL 08580990	Site of cottage	HA D/EV P2

Currie C K 1998: An archaeological desk-based assessment of Westwick Row Farm estate, Hemel Hempstead, Hertfordshire

In 1998 an archaeological desk-based assessment of the Westwick Row Farm estate was undertaken by Christopher Currie on behalf of The Crown Estate. This assessment was undertaken in order to assess the archaeological significance of the estate and to make recommendations on its management. The study area comprised the southern half of the current review area.

This identified a number of features of archaeological and cultural heritage within the estate, all of which have been considered in this assessment. In particular, the evidence was considered for Medieval settlement along Westwick



Row, including a possible manorial site and tithe barn which are referred to in documentary sources. The report also includes details on a geophysical survey that was completed with a view to identifying the location of the tithe barn, the results of which were inconclusive.

Site Visit

The site was visited by an Entec archaeologist on 13 November 2000 in order to inspect the area and to note any visible features of cultural heritage interest.

The northern part of the site consists predominantly of arable land sloping down to Hempstead Road. This part of the site is bisected by an abandoned railway line, known as the Nicky Line, which is now used as a footpath/cycle route. For most of its route across the site the Nicky Line is on an embankment and is flanked by trees. At the western edge it enters a shallow cutting and goes underneath Cherry Tree Lane, which crosses it on a brick arched bridge. The north-eastern corner of the site is close to Aubrey Fort SAM, which is located on the northern side of Hempstead Road. However, due to the presence of the Nicky Line embankment and a substantial tree cover around the fort, the SAM is not readily visible from the site.

Woodend and Cherry Tree Farm, both in the north-western part of the site, were not examined in detail. However both appeared to be probably nineteenth century farms with a range of mainly twentieth century farm buildings.

There is a small amount of woodland within the northern part of the site. This was examined carefully in case it preserved upstanding archaeological remains. No such remains were found.

The central part of the site consists of a narrow neck of arable land between the M1 and an industrial estate. There were no visible features of cultural heritage interest within this area.

The southern part of the site consists of agricultural land to either side of Westwick Row, with further land to the south of Hemel Hempstead Road.

The southern part of Westwick Row contains a number of historic agricultural buildings as well, retaining their rural setting. The agricultural land adjacent to Westwick Row is mostly arable, with some pasture to the south. Hedgerows within the southern part of Westwick Row screen most of this land from the lane. The northern part of Westwick Row is more open on the eastern side and has the housing of Leverstock Green to the west.

The fields to either side of Westwick Row tend to have a linear pattern leading away from the road. As previously stated they are mostly used for arable cultivation and do not contain any visible remains of cultural heritage interest. The single exception to this is the site of Bottom House Farm at NGR TL 08790735 within a pasture field immediately to the east of Green Lane. The remains of the farm are visible as earthworks which include a rectangular enclosure together with a series of banks and depressions.



To the south of Hemel Hempstead Road is further arable land, together with a small area of mature woodland called Blackwater Wood, which is managed by The Crown Estate. It was inspected in detail but was not found to contain any visible features of cultural heritage interest.

Assessment of Findings

Criteria

Features of cultural heritage interest are normally considered as being of either local, regional or national importance. Designated sites, such as SAMs must always be considered to be of national importance. These classifications are based on a number of criteria, contained within PPG16. Only information identified during this research has been used to assess significance, and it is possible that this assessment may change if further information becomes available.

Assessment

There are no are SAMs within the site, but there are a number of listed buildings that can be considered as being of national importance. A single SAM is located near to the extreme northern end of the site and development within this area could affect its setting. There are a number of listed buildings on Westwick Row and it is considered that these have a significant impact on the suitability of this immediate area for development.

Other features of potential archaeological interest have been identified within the estate and include:

- evidence of medieval occupation, including abandoned farm and cottage sites;
- a Quaker meeting house and cemetery;
- evidence for Roman occupation, including possible building remains and a road;
- crop mark features that may represent Prehistoric occupation;
- finds of flint and bronze artefacts that may represent Prehistoric occupation; and
- nineteenth century railway, the Nicky Line.



Conclusions: Potential Constraints to Development

Constraints - National

There are a number of possible constraints to development within certain parts of the site. There are eight listed buildings along Westwick Row, all of which are farmhouses, cottages or barns. Possibly the most important of these may be Westwick Cottage, which has been identified as being built around a twelfth century aisled hall.

Any work to demolish or alter a listed building requires listed building consent, which is administered by the local planning authority. In dealing with any application for development within the vicinity of a listed building the planning authority is also required to consider the impact on the setting of the listed building. Westwick Row retains a rural character within the immediate vicinity of the listed buildings and so development will need to consider the impact on this setting. Screening in the form of hedgerows and contours can be used to retain the existing setting.

The two SAMs within the vicinity of the site do not affect the development potential of any part of the site as both are effectively screened. Aubreys Fort is screened from the northern part of the site by the tree-lined embankment of the Nicky Line as well as by trees within the SAM itself. The temple is screened by existing buildings to the west of Green Lane.

It is not considered that any other features noted in this assessment are of national importance.

Constraints - Regional

Based on the limited information currently available, it is difficult to be certain about the significance of the known archaeology. However, it is possible that some of the features may be of regional significance.

The site of the Quaker meeting house and burial ground is likely to be considered as of regional significance. This is more as a result of the presence of burials than the remains of the meeting house. Records indicate that it was used for burial during the eighteenth century, and possibly the seventeenth century though the precise extent of burials is not known. It is possible to arrange for the archaeological excavation and removal of any burials in advance of any development. However, this may attract objections and dependant on the number of graves could be costly. However, this is only a very small part of the proposed development area.

There are a number of other potential features that may be of regional significance.

- It has been suggested that a Manor house and tithe barn may have been located within the immediate vicinity of Westwick Warren. Well preserved remains associated with such a site would be likely to be of regional significance.
- There is further evidence for medieval and post-medieval settlement within the site. This includes physical and documentary evidence for the presence of farmhouses and cottages within the site from



the mid-seventeenth century onwards, some of which are no longer present but may survive as archaeological remains. It is highly likely that settlement of this area will date to the medieval period and it has been noted that Westwick Cottage is built around a twelfth century structure. As no information is available on the extent or nature of any archaeological remains associated with medieval settlement it is not possible to be clear about the significance of such remains.

- There is evidence for Prehistoric occupation within the site, and particularly within land to the south of the A414. There is no direct evidence for Prehistoric settlement, but the presence of flint artefacts and crop marks (including a possible round barrow) suggest that this is a possibility. Settlement evidence would be likely to be of regional evidence, whilst other Prehistoric evidence, possibly representing agricultural use of the area would be more likely to be of local significance.

It is likely that restrictions on development that affect remains of regional importance can be overcome through agreement on alternative mitigation measures, such as excavation and recording. An archaeological research strategy might assist in reaching agreements on individual cases where excavation might be proposed, as it could demonstrate the enhancements and benefits that would result from a strategic approach.

In addition to the known archaeological sites, it would be prudent to anticipate further archaeological remains, which are, as yet, unknown. Until these are identified it would be premature to dismiss the possibility that there may be further sites of national or regional importance. It would be sensible, therefore, to anticipate the need for a phased archaeological evaluation programme, to be co-ordinated with development design stages, which could form part of an archaeological research strategy and would ensure appropriate design treatment if important features are to be preserved.

References

Surveyor unknown, 1634	Gorhambury Estate
Surveyor unknown, 1766	Map of Lord Grimston's Estate
Currie C K. 1998	An archaeological desk-based assessment of Westwick Row Farm estate, Hemel Hempstead, Hertfordshire, report prepared on behalf of The Crown Estate.
OS Map, 1899	6" Sheet 34 SW
OS Map, 1899	6" Sheet 34 NW
OS Map, 1899	6" Sheet 27 SW
OS Map, 1925	6" Sheet 34 SW
OS Map, 1925	6" Sheet 34 NW



OS Map, 1925

6" Sheet 27 SW





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