LAND AT OAKLEY FARM, BATTLEDOWN, CHELTENHAM

PREPARED BY PEGASUS GROUP | JANUARY 2020
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ENVIRONMENTAL STATEMENT VOLUME 1:
MAIN TEXT

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Project Directory **Statement of Competence**

The following competent experts have been involved in the preparation of this Environmental Statement on behalf of the Applicant.

Pegasus Group	Pegasus Group is a Member of the Institute of Environmental Management and Assessment (IEMA) and one of the founding members of the IEMA Quality Mark. Competent experts involved in the co-ordination of the Environmental Statement include Chartered members of the Royal Town Planning Institute and IEMA.
Pegasus Group	The Economics team at Pegasus Group leads on socio-economic analysis as part of Environmental Impact Assessments, regularly undertaking demographic and economic research around the country to support planning applications. The team is comprised of demographers and economists, while Pegasus Group is also a member of the Institute of Economic Development.
Air Quality CONSULTANTS	Competent experts involved in the assessment and preparation of the Air Quality chapter have full membership of the Institution of Environmental Sciences (MIEnvSc) and Institute of Air Quality Management (MIAQM).
PFA consulting	Competent experts involved in the assessment, preparation and checking of the Traffic and Transport chapter variously have Chartered membership of the Institute of Logistics & Transport (CMILT), Membership of the Chartered Institute of Highways & Transportation (MCIHT) or Membership of the Institution of Civil Engineers (MICE).
Phoenix Design Partnership	Competent experts involved in the assessment, preparation and checking of the Hydrology and Flood Risk chapter variously have full membership of the Chartered Institution of Water and Environmental Management (MCIWEM) and are Chartered Water and Environmental Managers (C.WEM) and Chartered Environmentalists (CEnv) or

	are Chartered Engineers registered with the Engineering Council.
Wilson Associates	Competent experts involved in the assessment and preparation of the Ground Conditions chapter have full membership of the Chartered Institution of Water and Environmental Management (MCIWEM), Chartered membership of the Institution of Structural Engineers (MIStructE), Institution of Civil Engineers (MICE) and are fellows of the Geological Society (FGS).
LFAcoustics consulting engineers	Competent experts involved in the assessment and preparation of the Noise chapter have full membership of the Institute of Acoustics (MIOA).
ecology solutions	Competent experts involved in the assessment and preparation of the Ecology chapter have full membership of the Chartered Institute of Ecology and Environmental Management (CIEEM) and are suitably licensed with regard to protected species surveys and mitigation requirements.
CHARTERED LANDSCAPE ARCHITECTS mhp	MHP is a LI Registered Practice and the LVIA has been prepared by a Chartered Member of the Landscape Institute. The Arboricultural survey as been carried out by a member of the Arboricultural Association.
rps MAKING COMPLEX EASY	RPS Consulting Services specialise in varied projects, including input to numerous EIAs in the form of Cultural Heritage chapters covering both buried archaeological remains and built heritage. RPS is a Registered Archaeological Organisation with the CIfA.

CONTENTS

FIGURES

1. Introduction

2. Assessment Methodology

3. Application Site and Proposed Development

4. Alternatives

5. Socio Economics

No Figures

6. Landscape and Visual

No Figures – See Appendices

7. Biodiversity

8. Cultural Heritage

9. Transport and Access

10. Air Quality

11. Noise and Vibration

No Figures

12. Hydrology, Flood Risk and Drainage

No Figures

13. Ground Conditions and Contamination

No Figures

14. Summary

No Figures

APPENDICES

1. Introduction

No Appendices

2. Assessment Methodology

Appendix 2.1 Scoping Opinion Request
Appendix 2.2 Cheltenham Borough Council Scoping Opinion

3. Application Site and Proposed Development

Appendix 3.1 Agricultural Land Classification Survey

4. Alternatives

No Appendices

5. Socio Economics

No Appendices

6. Landscape and Visual

Appendix 6.1 Figures and Viewpoints
Appendix 6.2 Arboricultural Survey and Statement

7. Biodiversity

Appendix 7.1 Information obtained from MAGIC
Appendix 7.2 Weather Conditions during Bat Surveys 2019
Appendix 7.3 Habitats Regulations Assessment – Cotswold Beechwoods SPA
Appendix 7.4 Suitable Examples of Bat Boxes
Appendix 7.5 Suitable Examples of Bird Boxes

8. Cultural Heritage

Appendix 8.1 Built Heritage Statement
Appendix 8.2 Archaeological Desk Based Assessment
Appendix 8.3 Geophysical Survey
Appendix 8.4 Archaeological (Trial Trench) Evaluation

9. Transport and Access

Appendix 9.1 Transport Assessment

Appendix 9.2 Residential Travel Plan

10. Air Quality

Appendix 10.1 Construction Dust Assessment Procedure

Appendix 10.2 Modelling Methodology

Appendix 10.3 EPUK & IAQM Planning for Air Quality Guidance

Appendix 10.4 Professional Experience

Appendix 10.5 Construction Mitigation

11. Noise and Vibration

Appendix 11.1 Noise and Vibration Technical Report

12. Hydrology, Flood Risk and Drainage

Appendix 12.1 Flood Risk Assessment & Drainage Strategy

13. Ground Conditions and Contamination

Appendix 13.1 Geoenvironmental Desk Study Report

Appendix 13.2 Phase 2 Ground Investigation Report

14. Summary

No Appendices

GLOSSARY AND ACRONYMS

Term / Acronym	Description
AEP	Annual Exceedance Probability. Used to express flood frequency E.g. A 1% AEP Flood has a 1% chance (1 in 100) of being exceeded in any year.
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
ALC	Agricultural Land Classification
AOD	Above Ordnance Datum - Baseline standard for measuring height usually measured in metres.
AQMA	Air Quality Management Area
AQAP	Air Quality Action Plan
Appropriate Assessment	An assessment required by the Habitats Directive where a project (or plan) would be likely to have a significant effect on a European site, either alone or in combination with other plans or projects (part of the Habitats Regulations Assessment process in the UK and the Appropriate Assessment process in Ireland).
ATC	Automatic Traffic Count - Two pneumatic rubber tubes, which are laid on either side of a carriageway. The tubes are connected to a separate recording device, to record traffic flow and speed by classification and time.
BAP	Biodiversity Action Plan. UK strategy for the conservation of biological resources, now largely succeeded by The 'UK Post-2010 Biodiversity Framework' but lists of priority species and habitats and forms the basis of much biodiversity work.
Baseline	Existing environmental conditions which are described in the ES
Bedrock deposits	The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.
Biodiversity	The biological diversity of the earth's living resources. The variety and abundance of species, their genetic composition, and the natural communities, ecosystems, and landscapes in which they occur.
Birds Directive	EC Directive on the conservation of wild birds (2009/147/EC)
Best and Most Versatile land	Is defined as Grades 1,2 and 3a by guidance in the NPPF. This is land that is most flexible, productive and efficient in response to inputs and which can best deliver future crops for food and non-food uses such as biomass, fibres and pharmaceuticals.
BMP	Biodiversity Management Plan

Term / Acronym	Description
BMV	Best and Most Versatile (Agricultural Land)
BoCC	Birds of Conservation Concern, as detailed in Eaton et al. (2015)
Building Emission Rate	The annual CO2 emitted by a building expressed in kg/m2
CadnaA	Computer Aided Noise Abatement – leading software for calculation, presentation, assessment and prediction of environmental noise.
CBC	Cheltenham Borough Council
CCTV	Close Circuit Television
CEMP	Construction Environmental Management Plan
Chartered Institute for Archaeologists	Professional organization for archaeologists working in the U.K
Chartered Institute of Ecology and Environmental Management	Professional body of which most professional consultant ecologists are members. Its aim is to raise the profile of professional ecological and environmental management and to promote the highest standards of practice for the benefit of nature and society.
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists
CMP	Construction Management Plan
CO_2	Carbon Dioxide
CO2e	Carbon dioxide equivalent - the internationally recognised measure of greenhouse emissions. The concentration of CO2 that would cause the same level of radiative forcing as a given type and concentration of greenhouse gas.
Conceptual Site Model	One of the primary planning tools that can be used to support the decision-making process managing contaminated land and groundwater on a large scale. The CSM organizes available information about a site in a clear and transparent structure and facilitate the identification of data and information gaps.
Conservation Area	Nearly always applies to an area (usually urban or the core of a village) considered worthy of preservation or enhancement because of its special architectural or historic interest.
Construction Environmental Management Plan	A site or project specific plan designed to ensure best practice and/or appropriate environmental management practices are applied throughout the construction, operation and/or demolition phases of a project.
Culvert	A means of allowing infrastructure (generally a highway, railway or waterway) to cross a watercourse.
dB	Decibel – A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1/s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa.
dB (A), L_{AX}	(noise quality) 1. Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which

Term / Acronym	Description
	differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
DAS	Design and Access Statement
Design and Access Statement	A statement accompanying and supporting an application that sets out the rationale for the design approach and how the Proposed Development would be accessed for a range of users
Design Manual for Roads and Bridges	A comprehensive manual system which accommodates all current standards, advice notes and other published documents relating to the design, assessment and operation of trunk roads (including motorways)
Detention Basins	A vegetated depression that is normally dry except following storm events. Constructed to store water temporarily to attenuate flows.
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
EC	European Commission - European Union's executive body. It represents the interests of the European Union as a whole (not the interests of individual countries).
EcIA	Ecological Impact Assessment is part of an EIA and assesses the potential effects of a development on habitats and species, particularly those protected by national and international legislation or considered to be of particular nature conservation importance.
Ecological feature/receptor	An ecological feature is a living system or entity that exists because of specific limiting factors such as the soils and nutrients, availability of water, climate, etc. An ecological receptor is a feature that is sensitive to or has the potential to be affected by an impact
eDNA	Environmental DNA is DNA that is collected from a variety of environmental samples such as soil, seawater, or even air rather than directly sampled from an individual organism
Emissions Factor Toolkit	Published to assist local authorities in carrying out Review and Assessment of local air quality as part of their duties under the Environmental Act 1995
Environmental Agency	An executive non-departmental government body working with responsibilities to protect and improve the environment, including flood risk management
Environmental Impact Assessment	Process for identifying the likely significance of environmental effects (beneficial or adverse) arising from a Proposed Development, by comparing the existing environmental conditions prior to development (the baseline) with the environmental conditions during/following the construction,

Term / Acronym	Description
	operational and decommissioning phases of a development should it proceed.
Environmental Statement	Document setting out the findings of an Environmental Impact Assessment.
EPS	European Protected Species
European Landscape Convention	The first international treaty dedicated to the protection, management and planning of all landscapes in Europe
Extended Phase 1 Habitat Survey	A habitats survey method originally published by the Nature Conservancy Council in 1990. It is intended to rapidly provide a record of semi-natural vegetation and wildlife habitat over large areas of countryside. It has been modified slightly, or extended, for the purposes of carrying initial assessments as to the likely ecological value of a site and its potential to support protected or notable species.
Flood Risk Assessment	An assessment as to the current and future flood risk of an area where development is proposed. A FRA is supporting information for a planning application.
Flood Zone 1	Low Probability – Land having a less than 1 in 1,000 annual probability of river flooding.
Flood Zone 2	Medium Probability – Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding.
Flood Zone 3a	High Probability – Land having a 1 in 100 or greater annual probability of river flooding.
Flood Zone 3b	The Functional Floodplain – This zone comprises land where water has to flow or be stored in times of flood.
Floodplain	This land where water has to flow or be stored in times of flood.
Forebay	A small basin or pond upstream of the main drainage component with the function of trapping sediment.
FRA	Flood Risk Assessment
GCN	Great Crested Newt
Geographical Information System	A system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data.
GHG	Greenhouse Gas
GLVIA3	'Guidelines for Landscape and Visual Impact Assessment. Third Edition'
Groundwater	Water below the surface of the ground and in direct contact with the ground or found subsoil in cracks and spaces in soil, sand and rock.
Groundwater Daughter Directive	Clarifies certain objectives of the Water Framework Directive relating to prevention and control of groundwater pollution and establishes groundwater quality standards.
'Guidelines for Landscape and Visual Impact Assessment. Third Edition'	Published in April 2013 by the Landscape Institute and the Institute of Environmental Management and Assessment. Guidance providing advice on the process of assessing the landscape and visual effects of developments and their significance.

Term / Acronym	Description
ha	Hectare – unit of measurement 100m x 100m, or 10,000m^2
Habitat connectivity	Linkage between areas of habitats, such as corridors to allow dispersal of wildlife
Habitats Directive	EC Directive on the conservation of natural habitats and of Wild Fauna and Flora (92/43/EEC)
Habitat of Principal Importance	Identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan (UK BAP). Statutory lists of priority habitats in England, are provided under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (England) – see also Priority habitat or species
Habitat Suitability Index (HSI)	A numerical index that represents the capacity of a given habitat to support a selected species. Most commonly used for pond habitats and great crested newts following a method developed by Oldham et al. (2000)
HDV	Heavy Duty Vehicles, (HGVs + buses)
Heavily modified waterbody	Bodies of water which as a result of physical alterations by human activity are substantially changed in character and cannot, therefore, meet "good ecological status"
Heavy Duty Vehicle	A vehicle with a gross vehicle weight greater than 3.5 tonnes. Includes Heavy Goods Vehicles and buses
Heavy Goods Vehicles	This comprises vehicles gross mass (i.e. including cargo) of 3.5 tonnes or over
HGV	Heavy Goods Vehicles
Hydrology	Movement, distribution, and quality of water on Earth.
IEMA	Institute of Environmental Monitoring and Assessment
Impact Risk Zone	A GIS tool developed by Natural England to make rapid initial assessment of the potential risks posed by development proposals to: Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites.
Institute of Environmental Monitoring and Assessment	Professional body for EIA and environmental practitioners
Invasive Non-native species	An alien plant or animal which is listed under Schedule 9 of the WCA, making it an offence to allow the species to be spread into the wild
JNCC	Joint Nature Conservation Committee
km	Unit of measurement for distance, 1km = 1000m
Landscape and Visual Impact Assessment	A documented and unbiased assessment of effects projects / developments may have on the identified landscape and visual resource.
Landscape Character Area	Single unique areas which are the discrete geographical areas of a particular landscape type. Each has its own individual character and identity, even though it shares the same generic characteristics with other types.

Term / Acronym	Description
Landscape Character Type	These are distinct types of landscape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation, historical land use, and settlement pattern.
LBAP	Local Biodiversity Action Plan. Local strategy for the conservation of biological resources, now largely succeeded by The 'UK Post-2010 Biodiversity Framework' but lists of priority species and habitats and forms the basis of much biodiversity work. The LBAP relevant is the Northamptonshire LBAP
LCA	Landscape Character Area
LCT	Landscape Character Type
Lead Local Flood Authority (LLFA)	Lead Local Flood Authorities (unitary authorities or county councils) are responsible for developing, maintaining and applying a strategy for local flood risk management in their areas and for maintaining a register of flood risk assets. They also have lead responsibility for managing the risk of flooding from surface water, groundwater and ordinary watercourses.
Listed Building	Marks and celebrates a building's special architectural and historic interest, and also brings it under the consideration of the planning system, so that it can be protected for future generations.
Local Wildlife Site	Non statutory designated site identified and selected for their local nature conservation value and protected through planning policy.
Local Planning Authority	The Council (County, Borough or District) that is empowered by law to exercise statutory town planning functions for a particular area (administrative boundary) of the UK
LPA	Local Planning Authority
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
Main River	Main rivers are usually larger rivers and streams. The Environment Agency carries out maintenance, improvement or construction work on main rivers to manage flood risk.
MAGIC	'Multi Agency Geographic Information for the Countryside' website – Government sponsored website containing environmental data from several public bodies including Natural England, the Environment Agency, English Heritage, Forestry Commission, Marine Management Organisation and the Department for Environment, Food and Rural Affairs
National Character Areas	Previously known as Joint Character Areas developed by the then Countryside Agency. These are areas that share similar landscape characteristics. See also LCA.
National Nature Reserve	Designated by Natural England as key places for wildlife and natural features in England. They were established to protect the most significant areas of habitat and of geological formations.

Term / Acronym	Description
National Planning Policy Framework	Document setting out the Government's planning policies for England and instruction on how they are expected to be applied. Latest version published in February 2019.
National Planning Practice Guidance	On-line resource to support the implementation of the NPPF
Natural Environment and Rural Communities (NERC) Act 2006	It requires local authorities and government departments to have regard to the purposes of conserving biodiversity in a manner that is consistent with the exercise of their normal functions such as policy and decision-making.
NCA	National Character Areas
NE	Natural England. The government's adviser for the natural environment in England, helping to protect England's nature and landscapes for people to enjoy and for the services they provide.
NERC Act 2006	Natural Environment and Rural Communities Act 2006
NIA	Nature Improvement Area – A network of large scale initiatives in England to improve ecological connectivity and biodiversity
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NTS	Non-Technical Summary – Summary document in a non-technical language
Ordinary watercourse	A watercourse that is not part of a Main River. All rivers and streams, ditches, drains, cuts, culverts, dikes, sluices, sewers (other than public sewers within the meaning of the Water Industry Act 1991) and passages, through which water flows.
Ordnance Survey	National mapping agency in the United Kingdom which covers the island of Great Britain
OS	Ordnance Survey
Phase 1 Habitat Survey	A habitats survey method originally published by the Nature Conservancy Council in 1990. It is intended to rapidly provide a record of semi-natural vegetation and wildlife habitat over large areas of countryside. It has been modified slightly, or extended, for the purposes of carrying initial assessments as to the likely ecological value of a site and its potential to support protected or notable species.
PIA	Personal Injury Accident
Pervious pavement	A surface that allows inflow of rainwater into the underlying construction or soil.
Planning Practice Guidance	On-line resource to support the implementation of the NPPF
PPG	Planning Practice Guidance
PPG24	Planning Policy Guidance 24: Planning and Noise - guides local authorities in England on the use of their planning powers to minimise the adverse impact of noise
PRA	Preliminary Roost Appraisal carried out to assess trees and other structures for its suitability to support roosting bats

Term / Acronym	Description
Priority habitat or species	Identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan (UK BAP). Statutory lists of priority species and habitats in England, are provided under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (England)
PRoW	Public Right of Way
Public Right of Way	Footpath, bridleway or byways over which members of the public have a right
PSV	Passenger Service Vehicle
Q_{BAR}	Mean Annual Flood (with a return period of approximately 2.3 years)
RAMS	Reasonable Avoidance Measures – Document to follow which outlines how the task should be undertaken to avoid any impact on ecological receptor
Ramsar sites	Wetlands of international importance designated under the Ramsar Convention (Convention on Wetlands of International Importance, especially as Waterfowl Habitats) (1971) and ratified in the UK in 1976)
Receptor	A location, feature (ground, watercourse) or individual (person, plant, bird, animal etc) upon which the effects of a proposed development is assessed, i.e. the receiving environment
Residual effect	Those impacts that remain following the implementation of mitigation measures
Riparian	Relating to lands adjacent to a watercourse
RPA	Root Protection Area
RSPB	Royal Society for the Protection of Birds - Nature conservation charity engaged in managing reserves, undertaking research and working to improve the value and management of land for wildlife, with particular focus on birds.
SAC	Special Area of Conservation - Sites chosen to conserve the natural habitat types and species of wild flora and fauna listed in Annex I and II of the Habitats Directive. They are the best areas to represent the range and variety of habitats and species within the European Union
Scheduled Monument	"Nationally important" archaeological site or historic building, given protection against unauthorised change
Site of Geological Importance	Local/regional site designated for its geological interest
Site of Special Scientific Interest	A statutory conservation designation denoting a protected area in the United Kingdom. An area of land of special interest by reason of its flora, fauna, geology or physiographical features notified under the Wildlife and Countryside Act 1981 (as amended)
SM	Scheduled Monument
SPA	Special Protection Area - Area designated under Article 4 of the EC Directive on Conservation of Wild Birds (Directive 2009/147/EC) for the protection of rare or vulnerable birds (as

Term / Acronym	Description
	listed on Annex I of the Directive) and for regularly occurring migratory species.
SPD	Supplementary Planning Document – Planning policy document that provides more detailed advice or guidance on the policies in the Local Development Plan.
SuDS	Sustainable Drainage System Management practices and control structures designed to drain surface water in a more sustainable fashion mimicking natural processes.
Surface water runoff	Rainwater (including snow and other precipitation) which is on the surface of the ground (whether or not it is moving), and has not entered a watercourse, drainage system or public sewer
Swale	A shallow vegetated channel designed to convey, treat or store surface water and facility infiltration.
The Town and Country Planning (EIA) Regulations 2017 (as amended)	Regulations that ensure sustainable economic development and a better environment by assessing the environmental consequences (positive and negative) of projects prior to the decision to move forward with the proposed development.
Water Framework Directive	A European Union directive which commits European Union member states to achieve good qualitative and quantitative status of all water bodies (including marine waters up to one nautical mile from shore) by 2015.
Water Resources Act 1991	An Act of the Parliament of the United Kingdom that regulates water resources, water quality and pollution, and flood defense
WCA WCA S1 WCA S5	Wildlife and Countryside Act (1981) Schedule 1 bird species on this Act Schedule 5 species on this Act
WFD	Water Framework Directive
WHO	World Health Organisation
World Health Organisation	Specialised agency of the United Nations that is concerned with international public health.
WRC	A Water Recycling Centre. A plant designed to treat foul water effluent before discharge into a watercourse (historically known as a Sewage Treatment Works).
ZoI	Zone of Influence - The areas/resources that may be affected by the biophysical changes caused by activities associated with a project.
Zone of Theoretical Visibility	Used within LVIAs to identify areas of interest for further investigation and assessment.
ZTV	Zone of Theoretical Visibility

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- Defra 2019 UK Ambient Air Quality Interactive Map, https://uk-air.defra.gov.uk/data/gis-mapping
- Defra 2019 UK Pollutant Release and Transfer Register, http://prtr.defra.gov.uk/map-search
- DfT 2018 The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy
- Gloucester, Cheltenham and Tewkesbury 2017 Joint Core Strategy 2011 - 2031
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- IAQM 2018 Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites, www.iaqm.co.uk/guidance.html
- ICCT 2017 NOx emissions from heavy-duty and light-duty diesel vehicles in the EU: Comparison of real-world performance and current type-approval requirements, http://www.theicct.org/nox-europe-hdv-ldv-comparison-jan2017
- Ministry of Housing, Communities & Local Government 2019 Planning Practice Guidance, https://www.gov.uk/government/collections/planning-practice-guidance
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- Highways Agency. Design Manual for Roads and Bridges. Volume 11. Section 3. Part 7. HD 213/11 – Revision 1. Noise and Vibration. November 2011
- World Health Organisation. Guidelines for Community Noise. 1999. WHO Geneva

12. Hydrology, Flood Risk and Drainage

- Cheltenham Borough Council Level 1 Strategic Flood Risk Assessment: 2008
- Cheltenham Local Plan: 2006
- Ciria C753 The SuDS Manual: 2015
- Emerging Cheltenham Plan
- Environment Agency Guidance on Pollution Prevention
- EU Floods Directive: 2007
- Flood and Water Management Act: 2010
- Flood Risk Assessments: Climate Change Allowances: 2019
- Flood Risk Regulations: 2009
- Gloucestershire Level 1 Strategic Flood Risk Assessment:2008
- Groundwater (England & Wales) Regulations: 2009
- Joint Core Strategy for Gloucester, Cheltenham, & Tewkesbury: 2017
- Land Drainage Act: 1991 & 1994
- National Planning Policy Framework: 2019
- None-Statutory Technical Standards for Sustainable Drainage: 2015
- Planning Practice Guidance: Climate Change: 2019
- Planning Practice Guidance: Flood Risk and Coastal Change: 2014
- Planning Practice Guidance: Water Supply, Wastewater and Water Quality: 2019
- Reservoirs Act: 1975

- River Severn: Catchment Flood Management Plan: 2009
- Severn River Basin Management Plan: 2018
- Sewers for Adoption 7th Edition: 2012
- Sustainable Drainage Systems SPG: 2003
- Water Framework Directive: 2000
- Water Resources Act: 1991

13. Ground Conditions and Contamination

- BS10175 'Code of Practice for the Investigation of Potentially Contaminated Sites' (2011)
- BS8485:2015 'Code of practise for the design of protective measures for methane and carbon dioxide ground gases for new buildings'
- Building Research Establishment (BRE): Radon – 'Guidance on Protective Measures for New Buildings'
- Cheltenham Borough Plan (2006) (saved policies)
- Cheltenham Borough Plan Pre Submission Version (February 2018)
- Construction Industry Research and Information Association (CIRIA) 665 'Assessing risks posed by hazardous ground gases to buildings' (2007)
- Environment Agency Contaminated Land Report 11 (CLR11) 'Model Procedures for the Management of Land Contamination'
- Environmental Protection Act 1990 – Part IIA
- Geological Survey of Great Britain 1:10,000 scale Sheet SO 92 SE, 1983
- Gloucester, Cheltenham and Tewkesbury Joint Core Strategy (December 2017)
- Landmark Information Group Envirocheck Report Ref: 65735794_1_1, March 2015
- National Planning Policy Framework (NPPF) (2019) replacing previous Planning Policy Statement 23 (PPS 23): Planning and Pollution Control - Annex 2: Development on Land Affected by Contamination
- Reading Agricultural Consultants, Agricultural Land Classification and Soil Resources Survey, September 2019
- Wilson Associates Geo-environmental Desk Study Report Ref: 4360, June 2018
- Wilson Associates Geotechnical Design Report Ref: 4360/2, November 2018

14. Summary

- No References

1 INTRODUCTION

1.1 INTRODUCTION

1.1.1 Robert Hitchins Limited (the "Applicant") is seeking to obtain planning permission for a residential development (the "Proposed Development") on Land at Oakley Farm, Cheltenham (the "Application Site").

1.1.2 This Environmental Statement (ES) has been prepared to accompany an outline planning application for a:-

> **"Development comprising up to 250 residential dwellings, associated infrastructure, ancillary facilities, open space and landscaping. Demolition of existing buildings. Creation of a new vehicular access from Harp Hill."**

1.1.3 The Application Site is situated within the administrative area of Cheltenham Borough Council (CBC). The location of the Application Site is shown on **Figure 1.1** and the extent of the Application Site is shown on **Figure 1.2**.

1.2 EIA REGULATIONS AND PROCEDURES

1.2.1 An ES is a document that sets out the findings of an Environmental Impact Assessment (EIA). An EIA is a process for identifying the likely significance of environmental effects (beneficial or adverse) arising from a Proposed Development, by comparing the existing environmental conditions prior to development (the baseline) with the environmental conditions during/following the construction, operational and decommissioning phases of a development should it proceed. The EIA is carried out prior to the submission of a planning application.

1.2.2 The statutory requirements for carrying out an EIA, the contents of the ES and the procedures for determining planning applications for 'EIA Development' are set out within the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the "EIA Regulations").

1.2.3 Where an application is made for planning permission for EIA development the local planning authority (LPA) is not permitted under the EIA Regulations to grant planning permission unless they have first taken the relevant environmental information into consideration.

Screening

1.2.4 The EIA Regulations require that any proposed development falling within the categories set out within Schedule 2 should be considered as 'EIA Development' where the development is considered likely to have significant effects on the environment by virtue of such factors as its nature, size or location (Regulation 2).

1.2.5 The Proposed Development falls within the category of "Urban Development Projects" under Schedule 2, paragraph 10(b) and accordingly the Applicant has prepared an ES. CBC issued a Screening Opinion confirming the requirement for an ES in April 2019.

Scoping

1.2.6 In order to determine the scope of an EIA, the EIA Regulations make provision for, but do not statutorily require, an applicant to request that the LPA provide a written opinion as to the information to be provided within the ES. Details of the scoping exercise carried out with regards the Proposed Development is set out in **Chapter 2**: **Assessment Methodology**.

1.3 STRUCTURE OF ENVIRONMENTAL STATEMENT

1.3.1 This ES comprises studies on each of the aspects of the environment identified as likely to be significantly affected by the Proposed Development (the 'technical chapters'), which are supported with figures and technical appendices where appropriate.

1.3.2 This ES is structured as follows:

- **Environmental Statement Volume 1: Main Text -** Comprises the main volume of the ES, including 'general chapters' that describe the EIA context, provide a description of the Application Site and Proposed Development, and set out the scope of the ES, followed by the 'technical chapters' for each environmental topic with the associated figures and concluding with a summary.
- **Environmental Statement Volume 2: Technical Appendix -** Comprises the technical appendices supporting each environmental topic.
- **Environmental Statement: Non-Technical Summary (NTS)** – this provides a concise summary of the ES identifying the likely significant environmental effects and the measures proposed to mitigate or to avoid adverse effects of the Proposed Development.

1.3.3 The content of the ES Main Text comprises:

- Chapter 1 Introduction
- Chapter 2 Assessment Methodology
- Chapter 3 The Application Site and Proposed Development
- Chapter 4 Alternatives
- Chapter 5 Socio Economics
- Chapter 6 Landscape and Visual
- Chapter 7 Biodiversity
- Chapter 8 Cultural Heritage
- Chapter 9 Transport and Access
- Chapter 10 Air Quality
- Chapter 11 Noise and Vibration
- Chapter 12 Hydrology, Flood Risk and Drainage
- Chapter 13 Ground Conditions and Contamination
- Chapter 14 Summary

1.3.4 For continuity, the figures and appendices are arranged and presented using the same reference numbers as the chapters as a means of providing supportive background and technical information.

The EIA Consultant Team

1.3.5 To ensure the completeness and quality of this ES it has been prepared by Pegasus Group. Pegasus Group is one of the founding members of the Institute of Environmental Management and Assessment (IEMA) Quality Mark which is a mark of excellence in EIA Co-ordination and management. Pegasus Group has obtained, and retained since inception, its EIA Quality Mark status which is assessed by IEMA.

1.3.6 The consultants, and their qualifications, which have contributed to the preparation of this ES are referenced in the project directory at the front of this document.

1.4 OTHER DOCUMENTS

1.4.1 A number of other documents have been submitted to the Council as part of, and accompanying, the planning application. These are set out in the covering letter to the planning application.

1.5 ENVIRONMENTAL STATEMENT AVAILABILITY AND COMMENTS

Availability

1.5.1 This ES should be made available by CBC for public viewing during normal office hours at:

Planning
Cheltenham Borough Council
Municipal Offices
Promenade
Cheltenham
Gloucestershire
GL50 9SA

1.5.2 The ES and planning application documents may also be available via the CBC's website once the planning application has been registered.

1.5.3 Alternatively, the ES may be purchased, the costs for which are set out below:

- Volume 1: Main Text - £75
- Volume 2: Technical Appendix - £150
- Non-Technical Summary (NTS) - Free of charge
- Digital copies of the above documents on a CD - £10

1.5.4 Postage is payable on all orders. For copies of any of the above please contact Pegasus Group at the following address (quoting reference P18-0847):

Pegasus Group
Pegasus House
Querns Business Centre
Whitworth Road
Cirencester
Gloucestershire
GL7 1RT
Tel: 01285 641717
Email: Cirencester@pegasusgroup.co.uk

Comments

1.5.5 Comments on the planning application should be forwarded to the CBC Planning Department located at:

Planning
Cheltenham Borough Council
Municipal Offices
Promenade
Cheltenham
Gloucestershire
GL50 9SA

2 ASSESSMENT METHODOLOGY

2.1 INTRODUCTION

2.1.1 This chapter explains the methodology used to prepare the technical chapters of this ES and describes its structure and content. In particular, it sets out the process of identifying and assessing the likely significant environmental effects of the Proposed Development.

2.2 GENERAL APPROACH TO ENVIRONMENTAL STATEMENT

2.2.1 An ES must contain the information specified in regulation 18(3) and must meet the requirements of Regulation 18(4). It must also include any additional information specified in Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended)1 (the "EIA Regulations") which is relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.

2.2.2 Regulation 18(3) and 18(4) states: -

> 3) An environmental statement is a statement which includes at least—
>
> (a) a description of the proposed development comprising information on the site, design, size and other relevant features of the development;
>
> (b) a description of the likely significant effects of the proposed development on the environment;
>
> (c) a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;
>
> (d) a description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment;
>
> (e) a non-technical summary of the information referred to in sub-paragraphs (a) to (d); and
>
> (f) any additional information specified in Schedule 4 relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.
>
> (4) An environmental statement must—
>
> (a) where a scoping opinion or direction has been issued in accordance with regulation 15 or 16, be based on the most recent scoping opinion or direction issued (so far as the proposed development remains materially the same as the proposed development which was subject to that opinion or direction);
>
> (b) include the information reasonably required for reaching a reasoned conclusion on the significant effects of the development on the environment, taking into account current knowledge and methods of assessment; and
>
> (c) be prepared, taking into account the results of any relevant UK environmental assessment, which are reasonably available to the person preparing the environmental statement, with a view to avoiding duplication of assessment.
>
> (5) In order to ensure the completeness and quality of the environmental statement –
>
> (a) the developer must ensure that the environmental statement is prepared by competent experts;

[1] The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended).

and

(b) the environmental statement must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts"

2.2.3 Schedule 4 states: -

Information for inclusion in environmental statements

1. A description of the development, including in particular:

(a)a description of the location of the development;

(b)a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;

(c)a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;

(d)an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.

2. A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.

4. A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.

5. A description of the likely significant effects of the development on the environment resulting from, inter alia:

(a)the construction and existence of the development, including, where relevant, demolition works;

(b)the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;

(c)the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;

(d)the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);

(e)the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;

(f)the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;

(g)the technologies and the substances used.

The description of the likely significant effects on the factors specified in regulation 4(2) should

cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project, including in particular those established under Council Directive 92/43/EEC(1) and Directive 2009/147/EC(2).

6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.

8. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU(3) of the European Parliament and of the Council or Council Directive 2009/71/Euratom(4) or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.

9. A non-technical summary of the information provided under paragraphs 1 to 8.

10. A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.

2.2.4 Accordingly, this ES comprises the following information:

- A description of the development comprising information about the site including the nature, size and scale of the development;
- The data necessary to identify and assess the main effects which the development is likely to have on the environment;
- A description of the likely significant effects of the development covering, direct effects and any indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects, explained by reference to the development's possible effect on cultural and archaeological heritage, landscape and the interaction between any of the foregoing material assets (as appropriate).
- Where significant adverse effects are identified with respect to any of the foregoing, mitigation measures will be proposed in order to avoid, reduce or remedy those effects; and
- A summary in non-technical language of the information specified above.
- A statement outlining the relevant experience of the experts who have undertaken the assessment and drafted the technical chapters within the ES.

2.3 DEVELOPMENT PARAMETERS

2.3.1 The Proposed Development, which has been the subject of this EIA, is described in more detail within **Chapter 3**: The Application Site and Proposed Development . To ensure that the Proposed Development, as it evolves with the benefit of subsequent approvals and/or reserved matters, will remain the same as that assessed within this ES, Development Parameters and an accompanying Parameter Plans have been established and assessed. Together, these contain the parameters and controls defining those aspects of the Proposed Development capable of having significant environmental effects, as defined in the EIA Regulations.

2.3.2 The matters encapsulated within the Development Parameters and Parameter Plans include:

- Land use;
- Building heights;
- Access and Movement; and
- Green Infrastructure.

2.4 SCOPE OF ENVIRONMENTAL IMPACT ASSESSMENT

2.4.1 In order to determine the scope of the EIA a request for a Scoping Opinion was submitted on behalf of the Applicant to CBC on 7th May 2019 (see **Appendix 2.1**). The request described the site context, the nature and purpose of the Proposed Development, and identified the proposed scope and structure of the EIA for the Council's consideration.

2.4.2 CBC issued its Scoping Opinion on 12th July 2019 with accompanying consultee responses (see **Appendix 2.2**), confirming their agreement to the development proposals constituting EIA development and setting out the scope of assessment they considered appropriate.

2.4.3 Accordingly, the environmental themes scoped into or out of the EIA are given in **Table 2.1.**

Table 2.1: Environmental Themes Scoped In / Out

EIA Topic (as stated in EIA Regs 2017)	Scoped In / Out	How/Where addressed/Reason for Scoping Out
Population	Scoped in	Assessed within the Socio-Economic chapter. Transport related considerations are assessed in the Transport and Access Chapter. A Transport Assessment and Draft Travel Plan is also provided as part of the planning application materials.
Human Health	Scoped in	Assessed within technical environmental chapters where impacts could affect human beings, for example the potential effects on local health care provision and access to open space are addressed in the Socio-Economic chapter, local air quality in the Air Quality chapter and noise and vibration in the Noise and Vibration Chapter.
Biodiversity	Scoped in	Assessed within the Biodiversity chapter.
Land	Scoped in	The alterations to the current land use will be considered in the relevant environmental assessments, for example the Landscape and Visual and Biodiversity Chapters. An Agricultural Land Classification (ALC) Survey is provided.
Soil	Scoped in	Assessed in the Ground Conditions and Contamination Chapter. Hydrogeology and archaeology matters which relate to ground conditions are assessed within the relevant technical chapters. An Agricultural Land Classification (ALC) Survey is provided.
Water	Scoped in	Assessed in the Hydrology, Flood Risk and Drainage chapter.

Air	Scoped in	Assessed within the Air Quality chapter.
Climate	Scoped in	Climate change is considered accordingly as a cross cutting theme within relevant technical chapters as well as in respect to consideration of alternatives.
Material Assets	Scoped out	It is not considered there are any further 'material assets' to those already addressed within other EIA topics. Matters relating to the construction of the development, including demolition works and standard construction and best practice techniques to minimise effects relating to control of emissions, pollutants, noise, vibration and lighting are described in Chapter 3 Application Site and Proposed Development and the relevant technical chapters (e.g. Noise and Vibration, Air Quality and Hydrology, Flood Risk and Drainage). A Waste Minimisation Statement is provided as a standalone report as part of the documents submitted for the planning application.
Cultural Heritage including Architectural and Archaeological aspects	Scoped in	Assessed within with the Cultural Heritage Chapter.
Landscape	Scoped in	Assessed in the Landscape and Visual chapter. An Arboricultural Survey is appended to the Landscape and Visual Chapter.
Risks of Major Accidents and Disasters	Scoped out	The nature, scale and location of the Proposed Development is not considered to be vulnerable to or give rise to significant impacts in relation to the Risk of Accidents and Major Disasters.
Interelationship between above factors	Scoped in	Assessed within each topic chapter under the heading Cumulative and In-Combination Effects.

2.4.4 Any subsequent discussions regarding the scope of the assessment that has been undertaken separately to the EIA scoping process, is discussed within the relevant technical chapters.

2.4.5 Given the nature and intended longevity of the Proposed Development's operational life, decommissioning has not been considered as part of this study. Accordingly, this EIA focuses on the potential likely significant effects of the Proposed Development during the construction and operational phases only.

2.5 ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY

2.5.1 The content of the ES is based on the following:

- Review of the baseline situation through existing information, including data, reports, site surveys and desktop studies;
- Consideration of the relevant National Planning Policy Framework (NPPF) and accompanying National Planning Practice Guidance (NPPG), and the statutory extant and emerging development plan policies;
- Consideration of potential sensitive receptors;
- Identification of likely significant environmental effects and an evaluation of their duration and magnitude;
- Expert opinion;

- Modelling;
- Use of relevant technical and good practice guidance; and
- Specific consultations with appropriate bodies.

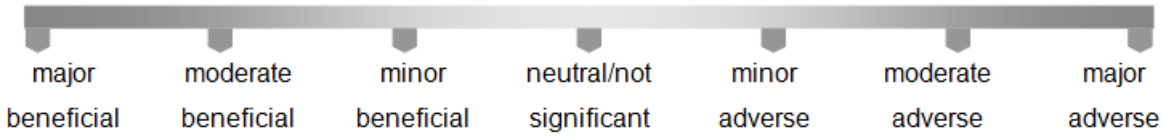
2.5.2 Environmental effects have been evaluated with reference to definitive standards and legislation where available. Where it has not been possible to quantify effects, assessments have been based on available knowledge and professional judgment.

2.6 DETERMINING SIGNIFICANCE

2.6.1 The purpose of the EIA is to identify the likely 'significance' of environmental effects (beneficial or adverse) arising from a Proposed Development. In broad terms, environmental effects are described as:

- Adverse – detrimental or negative effects to an environmental resource or receptor;
- Beneficial – advantageous or positive effect to an environmental resource or receptor; or
- Negligible – a neutral effect to an environmental resource or receptor.

2.6.2 It is proposed that the significance of environmental effects (adverse, negligible/neutral or beneficial) would be described in accordance with the following 7-point scale:-



2.6.3 Significance reflects the relationship between two factors:

- The magnitude or severity of an effect (i.e. the actual change taking place to the environment); and
- The sensitivity, importance or value of the resource or receptor.

2.6.4 The broad criteria for determining magnitude are set out in **Table 2.2**.

Table 2.2: Degrees of Magnitude and their Criteria

Magnitude of Effect	Criteria
High	Total loss or major/substantial alteration to elements/features of the baseline (pre-development) conditions such that the post development character/composition/attributes will be fundamentally changed.
Medium	Loss or alteration to one or more elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed.
Low	A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible / detectable but the underlying character / composition / attributes of the baseline condition will be similar to the pre-development.
Negligible	Very little change from baseline conditions. Change not material, barely distinguishable or indistinguishable, approximating to a 'no change' situation.

2.6.5 The sensitivity of a receptor is based on the relative importance of the receptor using the scale in **Table 2.3**.

Table 2.3: Degrees of Sensitivity and their Criteria

Sensitivity	Criteria
High	The receptor / resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance.
Medium	The receptor / resource has moderate capacity to absorb change without significantly altering its present character, or is of high and more than local (but not national or international) importance.
Low	The receptor / resource is tolerant of change without detrimental effect, is of low or local importance.
Negligible	The receptor / resource can accommodate change without material effect, is of limited importance.

2.6.6 Placement within the 7-point significance scale would be derived from the interaction of the receptor's sensitivity and the magnitude of change likely to be experienced (as above), assigned in accordance with **Table 2.4**, whereby effects assigned a rating of Major or Moderate would be considered as 'significant'.

Table 2.4: Degrees of Significance

Magnitude of Change	Sensitivity of Receptor				
		High	**Medium**	**Low**	**Negligible**
	High	Major	Major	Moderate	Negligible
	Medium	Major	Moderate	Minor to Moderate	Negligible
	Low	Moderate	Minor to Moderate	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

2.6.7 The above magnitude and significance criteria are provided as a guide for specialists to categorise the significance of effects within the ES. Where discipline-specific methodology has been applied that differs from the generic criteria above, this is clearly explained within the given chapter under the heading of Assessment Approach.

2.6.8 As can be seen from **Table 2.5** when an environmental effect is assessed as having a major or moderate degree of significance it is deemed to be "significant". These are the shaded cells in **Table 2.5**. When such a significant effect occurs consideration of mitigation solutions or enhancements to minimise the effect (which can include design alterations) will be considered. Once these mitigations and enhancements have been assessed the degree of significance may decrease to minor/moderate, minor or negligible. If such a level of environmental effect occurs the Proposed Development is no longer considered as creating a "significant effect".

2.6.9 Significance of effects would be assigned both before and after mitigation.

2.7 MITIGATION

2.7.1 Standard measures and the adoption of construction best practice methods to avoid, minimise or manage adverse environmental effects, or to ensure realisation of beneficial effects, are assumed to have been incorporated into the design of the Proposed Development and the methods of its construction from the outset. Further information on the standard measures and construction best practice is detailed in **Chapter 3: The Application Site and Proposed Development**. Where outlined, the assessment is of the Proposed Development incorporating these measures.

2.7.2 Where mitigation measures are proposed that are specific to an environmental theme (i.e. ecological measures incorporated into the landscaping scheme, exclusion of areas of archaeological significance from development etc) and incorporated into the design, these are also outlined within **Chapter 3**, and highlighted within the relevant technical chapter.

2.7.3 Where the assessment of the Proposed Development has identified potential for adverse environmental effects, the scope for mitigation of those effects, for example by way of compensatory measures, has been considered and is outlined in the appropriate technical chapter. It is assumed that such measures would be subject to appropriate planning conditions or obligations.

2.7.4 Where the effectiveness of the mitigation proposed has been considered uncertain, or where it depends upon assumptions of operating procedures, then data and/or professional judgment has been introduced to support these assumptions.

2.8 CUMULATIVE AND IN-COMBINATION EFFECTS

Cumulative Effects

2.8.1 Within EIA, cumulative effects are generally considered to arise from the combination of effects from the Proposed Development and from other proposed or permitted schemes in the vicinity, acting together to generate elevated levels of effects. Examples of these kinds of effects that can be readily appreciated could include:

- Traffic generated from developments, affecting the surrounding road network;
- Air quality effects from developments; and
- Discharges to the water environment.

2.8.2 CBC advised in their Scoping Opinion issued on 12th July 2019 (see **Appendix 2.2**) that "*Further detail will be required of the cumulative effects of the proposed development with other relevant existing or proposed developments within the area; and the interrelationship between issues, particularly with regards to infrastructure and services, traffic generation, flood risk potential and impact on the AONB. A number of the statutory consultees have commented specifically on the need to take full account of the needs and impacts on both existing and planned development within the locality (which should not always be restricted to adjacent land and land users) and refer to the potential 'in combination effects' of the proposals.*"

2.8.3 Land at Oakley Farm is adjacent to the former GCHQ Oakley site to the north of the Application Site which has been redeveloped for housing in three phases since approximately 2006. A Sainsbury supermarket is located to the west of the residential component of the GCHQ Oakley site fronting Priors Road. To the west of the Application Site is an established residential area associated with Wessex Drive and to the south is an established residential area on the southern side of Harp Hill. To the east of the Application Site is a covered reservoir.

2.8.4 A list of developments to be considered with regards cumulative effects are summarised in **Table 2.5** and shown on **Figure 2.1**.

Table 2.5: Projects Considered in the Cumulative Assessment

Scheme	Location	Details
GCHQ Oakley, Prioirs Road Cheltenham (Also referred to as Oakley Grange)	Directly to the north of the Application Site	Outline planning approval granted under CB11954/43[2] (**Approved October 1998**), as varied by the extension at the time period for the submission of reserved matters to 15 years, as approved under 01/00637/CONDIT and confirmed under 09/01110/CLPUD. The outline permission was for residential development (20 ha) and provision of district centre incorporating food superstore (1.6ha) Various reserved matters and variation of consent applications the latest of which is 19/00921/CONDIT | Variation of condition 2 of Planning Permission 13/01683/REM, variation of reserved mattrers , Revisions to approved House Types (**Validated May, 2019, Pending Consideration**). Reserved matters applications include: Phase 1 - 06/00352/REM Residential development consisting of 159 dwellings, garages, highway, drainage, landscaping and associated works (**Approved May 2006**) Phase 1 - 06/00380/REM Residential development consisting of 103 dwellings, garages, drives, footpaths, highway, engineering, landscape and associated works (**Approved May 2006**) Phase 2 - 07/01296/REM Residential development comprising 53 dwellings (Approved April 2008) Phase 2 – 07/01465/REM Residential development comprising 104 dwellings (**Approved April 2008**) Phase 3 - 13/01683/REM Erection of 311 dwellings and associated roads, footways, parking, landscaping, drainage and public open space (**Approved March 2014**). The site is subtantially built out and occupied. Permission for the Sainsbury's store has been implemented and Phases 1 and 2 of the total residential development have been completed.
Bouncers Lane Cheltenham Gloucestershire	600m to the north of the Application Site	17/00929/OUT - Outline application for up to 58 residential dwellings including access with all other matters reserved for future consideration (**Approved October 2017)** 18/01527/REM | Development of site to provide 54 dwellings. Submission of Reserved Matters (access, layout, scale, appearance and landscaping) following the approval of outline approval (17/00929/OUT) (**Approved April 2019**) Located near to proposed housing allocation HD3 of the emerging Local Plan for Cheltenham.
Cromwell Court Greenway Lane Charlton Kings Cheltenham	30m to southeast of Application Site	18/02581/FUL | Demolition of existing dwelling and construction of 8 x self & custom build dwellings with associated works and infrastructure, including sustainable drainage, new internal access roads, improvements to existing internal access road, site

[2] Reference 97/00818/PO is stated as an alternative reference for CB11954/43 on CBC's website although both refer to the outline permission granted in October 1998.

		regrading and landscape planting (**Approved March 2019**).

2.8.5 With respect to inter-project cumulative effects, the EIA Regulations state that consideration should be given to "other existing and/or approved projects" (Schedule 4, paragraph 5(e)) in relation to cumulative effects. This is also re- iterated in Planning Practice Guidance on EIA (Para 024, Revised 28/07/2017). The ES considers existing or proposed schemes (subject to a valid planning application) with the potential to cause significant cumulative effects in combination with the Proposed Development.

2.8.6 Consideration was given to the following two developments in terms of the potential for cumulative effects:

- 15/02176/FUL | Demolition of existing dwelling known as 'The Bredons' and erection of 2 no. detached dwellings and associated works | The Bredons Harp Hill Charlton Kings Cheltenham GL52 6PR. Permitted Wed 03 Feb 2016.
- 15/01165/FUL | Erection of two dwellings and associated works | Land Adj To Gray House Harp Hill Charlton Kings Cheltenham Gloucestershire. Permitted Wed 28 Oct 2015.

2.8.7 Whilst located in proximity to the site to the south of Harp Hill, it was not considered likely that these developments would be likely to generate significant cumulative effects in the context of the EIA Regulations and Planning Practice Guidance. The above developments both represent two dwellings respectively and Google Earth indicates that both of these schemes were under construction in April 2019.

2.8.8 The Cheltenham Borough Local Plan Submission Version Proposals Map (February 2018) shows the following proposed housing allocations are located within approximately 1km of the Application Site:

- Proposed Housing Allocation Site HD7 – Located approximately 200m to the north. No existing planning applications for residential development are shown on Cheltenham Borough Council's planning website at the time of writing. Land at Priors Farm Fields (Policy HD7) is located to the north of the former GCHQ Oakley site. Land at Priors Farm Fields is in close proximity to Wymans Brook and is bounded by residential development to the south and west and the cemetery to the north. Land at Oakley Farm, lies immediately south of land originally forming part of the GCHQ Oakley site now developed as a new residential area
- Proposed Housing Allocation HD4 – Located approximately 700m to the southwest of the Application Site. A revised application for housing at this site (Ref 18/02171/OUT) was refused in October 2018 (following revision to earlier application 17/00710/OUT'). This application was dismissed at appeal on 20 September 2019 (Appeal Ref: APP/B1605/W/19/3227293).
- Proposed Housing Allocation HD3 - Located approximately 550m to the north of the Application Site. No existing planning applications for residential development are shown on Cheltenham Borough Council's planning website at the time of writing. The approved application at Bouncers Lane listed in Table 2.5 is located near to this allocation.

2.8.9 These proposals are not discussed further in the ES as it is understood that no existing planning applications / appeals on which to base the assessment are available and their status may be subject to change.

In-Combination Effects

2.8.10 In-combination effects arise where effects from one environmental element bring about changes in another environmental element. These effects are also reviewed in each of the technical chapters of this ES. Examples of the main types of interactive effects are as follows:

- Effects of traffic on noise;
- Effects of traffic on air quality;
- Effects of water discharges on ecology;
- Effects of landscaping on ecology;
- Effects of waste on traffic; and
- Effects of land contamination on air and water quality.

2.9 GENERAL ASSUMPTIONS AND LIMITATIONS

2.9.1 The principal assumptions that have been made and any limitations that have been identified in preparing this ES are set out below:

- All of the principal land uses adjoining the Application Site remain as present day, except where redevelopment proposals have been granted planning consent. In those cases it is assumed the redevelopment proposals will be implemented or would but for the development being implemented;
- Information received from third parties is complete and up to date;
- The design, construction and completed stages of the Proposed Development will satisfy legislative requirements; and
- Conditions will be attached to the planning permission with regards "mitigation", where considered necessary to make the development acceptable.

STRUCTURE OF TECHNICAL CHAPTER

2.9.2 Throughout the EIA process, the likely significant environmental effects of the Proposed Development will be assessed. Within each of the technical chapters the information which will inform the EIA process has generally been set out in the following way:

- **Introduction** – to introduce the topic under consideration, state the purpose of undertaking the assessment and set out those aspects of the Proposed Development material to the topic assessment;
- **Assessment Approach** – to describe the method and scope of the assessment undertaken and responses to consultation in relation to method and scope in each case pertinent to the topic under consideration;
- **Baseline Conditions** – a description of the baseline conditions pertinent to the topic under consideration including baseline survey information;
- **Assessment of Likely Significant Effects** - identifying the likely effects, evaluation of those effects and assessment of their significance, considering both construction and operational and direct and indirect effects;
- **Mitigation and Enhancement** - describing the mitigation strategies for the significant effects identified and noting any residual effects of the proposals;
- **Cumulative and In-combination Effects** - consideration of potential cumulative and in-combination effects with those of other developments; and
- **Summary** – a non-technical summary of the chapter, including baseline conditions, likely significant effects, mitigation and conclusion.

3 APPLICATION SITE & PROPOSED DEVELOPMENT

3.1 INTRODUCTION

3.1.1 This chapter of the ES provides a description of the Application Site and Proposed Development.

3.2 APPLICATION SITE

3.2.1 The Site comprises 15.29 hectares of predominantly agricultural land and includes buildings associated with Oakley Farm. The 13 hectares of agricultural land has been classified as Grade 3b which is not considered to be best and most versatile land. A detailed agricultural land classification survey is provided at **Appendix 3.1**. There are six buildings in the north of the Application Site.

3.2.2 To the south, the Site is bound by Harp Hill with residential properties situated along this road. To the west and north the Site is bound by residential development. To the east the site is bound by residential development and the underground Hewlett's Reservoir.

3.2.3 The site is situated to the north east of Cheltenham town centre on the lower slopes of the Cotswold Scarp at Oakley and is within the Cotswolds Area of Outstanding Natural Beauty (AONB).

3.2.4 The Site currently comprises six semi-improved grassland fields that are bounded by hedgerows and trees, as well as smaller areas of scrub, brambles, ruderal vegetation / grassland, amenity grassland, hardstanding and farm buildings. The former farmstead of Oakley Farm is located towards the northern boundary of the Site and is accessed by a single track from the west.

3.2.5 The Site is bounded on three sides, to the south, west and north by existing residential development and to the east by the listed structures of Hewlett's Reservoir. The Site is bounded to the south by Harp Hill Road and to the west by Wessex Drive both of which are established residential areas. The Site is bounded to the north by the former GCHQ Oakley site which has recently been redeveloped for residential purposes with Pillowell Close, Brockweir Close and Fairford Road situated adjacent to the northern boundary of the Site and Bream Court and Birdlip Road to the north east of the site.

3.2.6 The Site is well connected to the existing residential suburbs of Cheltenham with Battledown to the south, Whaddon to the west and Prestbury to the north. There is limited public access to a Public Right of Way (PRoW) along the western boundary of the Site, but no other public footpaths cross the Site.

3.2.7 The Application Site is located wholly within Flood Zone 1, the least risk area of flood risk probability.

3.2.8 There are no World Heritage Sites, Scheduled Monuments or Listed Buildings within the Application Site, nor does the Application Site lie within a Conservation Area.

3.2.9 Battledown Camp Scheduled Monument is located approximately 160m south of the Site. The site is bound to the east by Hewlett's Reservoir which includes four Grade II Listed elements, comprising:

- No. 1 Reservoir;
- No. 2 Reservoir;
- Pavilion at Hewlett's Reservoir; and

- Gates, gate piers and boundary walls at Hewlett's Reservoir.

3.2.10 The location and extent of the Application Site is shown on **Figures 1.1** and **1.2.**

3.3 PROPOSED DEVELOPMENT

3.3.1 The Proposed Development comprises:

- Demolition of existing buildings;
- Up to 250 residential units;
- Vehicular and pedestrian accesses from B4075 Harp Hill;
- Sustainable Drainage System (SuDs); and
- Associated roads, open space, landscaping and other infrastructure.

3.3.2 The Proposed Development which is the subject of this EIA is shown within the Parameter Plans provided in the following Figures:

- **Figure 3.1:** Land Use Parameter
- **Figure 3.2:** Building Heights Parameter
- **Figure 3.3:** Green Infrastructure Parameter
- **Figure 3.4:** Access and Movement Parameter

Residential

3.3.3 Up to 250 residential units will be provided in a mixture of dwelling types. The residential development will be located within the residential development envelopes. The residential development envelopes include the residential dwellings themselves, amenity green space, incidental informal open space, SuDs and secondary roads. The locations of the residential development are shown on **Figure 3.1.**

Building Heights

3.3.4 The building height within the Proposed Development have been established in response to a combination of factors including the vision for the Proposed Development, housing densities and the existing building heights in the surrounding area. The proposed building heights are shown on **Figure 3.2**. The heights of the proposed buildings will vary according to their position within the site and their function in the landscape.

Public Open Space and Green Infrastructure

3.3.5 Public open space and play areas will be provided throughout the Proposed Development on **Figure 3.3**.

Surface Water Drainage

3.3.6 Sustainable Drainage Systems (SuDS) will be provided to manage surface water run-off. The surface water drainage strategy aims to mimic existing hydrological conditions. Where possible existing ditches and new swales/channels will be used to convey flows to and from the attenuation basins.

Access and Movement

3.3.7 Vehicular access will be provided from Harp Hill as shown on **Figure 3.4.**

Footpaths and Cycle Routes

3.3.8 The Proposed Development proposes the provision of safe, direct, convenient and interesting footpaths and cycle routes.

3.3.9 The development of a pedestrian/cycle network within the Site is seen as an integral part of the transport infrastructure for the Proposed Development. The potential for connection to any future off-site network will allow users of all ages and abilities to move safely and conveniently between all points of the development and surrounding facilities. Indicative locations for pedestrian and cycleway linkages are shown on **Figure 3.4.**

3.3.10 The following measures to provide accessibility by foot and cycle are proposed: -

- Provision of pedestrian/cycle links through the Site;
- Internal road layout design to ensure low traffic speeds. The design will promote safe walking and high permeability through the site, and limit potential for anti-social behaviour;
- Particular attention to be paid to surface quality, and sufficient 'overlook' to provide a sense of safety and security for users; and
- Appropriate signage and crossing points of roads through the Proposed Development, to include dropped kerbs, tactile paving and guardrails as appropriate.

Car Parking

3.3.11 A number of car parking options will be pursued at the detailed design stage, subject to negotiations with CBC.

3.4 DEVELOPMENT PROGRAME OF CONSTRUCTION

Introduction

3.4.1 Detailed consideration of potential effects during the construction process and any mitigation measures are provided in each relevant chapter of this ES.

3.4.2 Planning for construction is necessarily broad at this stage and may be subject to modification during the detailed design stage and in some instances when construction has commenced. Consequently, it has been necessary to predict some of the likely significant effects of the construction of the Proposed Development with the best possible degree of accuracy based on worst case scenarios.

Programme of Works

3.4.3 The construction programme will span approximately eight years. The estimated commencement date is 2021, subject to gaining planning permission.

3.4.4 Construction procedures will be drawn up and best practice techniques employed to ensure that any adverse effects which may arise during the construction phase of the Proposed Development are minimised.

3.4.5 The programme can be divided into the following main stages:

- Enabling and site clearance works;
- Construction of Access and Primary Infrastructure; and
- Construction of residential development.

Construction Methodology

Hours of Work

3.4.6 It is anticipated that the working hours will be as set out below:

- 07.00 – 18.00 Monday to Friday; and
- 07.00 – 13.00 Saturday

3.4.7 These working hours will be agreed with CBC prior to the commencement of the works. All work outside these hours will be subject to prior agreement, and/or reasonable notice, by CBC, who may impose certain restrictions. Night time working will be restricted to exceptional circumstances.

Construction Environmental Management

3.4.8 Measures to eliminate, reduce or offset adverse environmental effects are identified below:

- Preparation of procedures which will clearly set out the methods of managing environmental issues for all involved with the demolition and construction works, including supply chain management;
- Requirement to comply with these procedures included as part of the contract conditions for each element of the work. All contractors tendering for work will be required to demonstrate that their proposals can comply with the procedures and current best practice techniques;
- In respect of necessary departures from the procedures CBC and affected parties will be notified in advance;
- Establishing a dedicated point of contact and responsibility to deal with issues if they arise; this will be a named representative from the construction manager or contractor, part of the professional team (the Construction Liaison Officer, see below); and
- Regular dialogue with CBC and the local community.

3.4.9 The establishment of agreed methods and procedures enables any prospective departures to be identified, the reasons understood and appropriate provisions made.

3.4.10 Details will be provided to CBC (and other relevant bodies) prior to commencement of the works. It will include the following:

- The plan of the phasing of the works and its context within the whole project;
- Baseline levels for noise, vibration and dust and details of any monitoring protocols that may be necessary during the works;
- Housekeeping procedures and environmental control measures;
- Any requirement for monitoring and record keeping;
- Contact details during normal working hours and emergency details outside working hours;
- Provision for reporting, public liaison, prior notification etc.;
- The mechanism for the public to register complaints and the procedures for responding to complaints;
- Prohibited or restricted operations (location, hours etc.);
- Details of construction operations highlighting any operations likely to result in disturbance and/or working hours outside the core working period, with an indication of the expected duration of key phases and dates;

- The details of proposed routes for heavy goods vehicles travelling to and from the Application Site; and
- Details of all works involving interference with a public highway, including temporary carriageway/footpath closures, realignment and diversions.

3.4.11 Further details on key issues are provided in the rest of this chapter.

Management of sub-contractors

3.4.12 Individual contracts (for example for waste removal) will incorporate relevant requirements in respect of environmental control, based largely on the standard of 'good working practice' as well as Statutory Requirements. Potential sub-contractors will be required to demonstrate how they will achieve best practice, how targets will be met and how potential effects will be minimised.

Management of Construction Works

3.4.13 Contact details will be provided at the site entrance, and will be provided to CBC prior to the start of site activities, and whenever a change of responsibility occurs.

Responses to Complaints

3.4.14 Any complaints will be logged, where necessary. The procedures will specify the roles and responsibilities in respect of breaches and complaints from the public. The required actions will be different in each specific case, depending on the operation, equipment or location, or applying additional controls.

Prior Notice

3.4.15 In the event of unusual activities or events that can be anticipated, these will be notified to CBC, other relevant bodies and to the relevant property owners or occupiers wherever possible and neighbours, in advance of the activity.

Traffic Management

3.4.16 Whilst no long-term road closures are envisaged, short term closures may be required in order to establish and remove cranes or to deliver large items of building plant. If this is to be required then consent will be obtained from the Highways Authority.

3.4.17 It will be the responsibility of the Applicant or their Contractor to finalise consultations with CBC. Notice regarding planned closures and diversions of roads and footpaths forming part of the site shall be given by the Applicants or their Contractor to the Highways Authority sufficiently in advance of the required closure or diversion dates in accordance with legal requirements.

3.4.18 Heavy Goods Vehicles (HGV) access will be from the proposed junction into the site off Harp Hill.

3.4.19 In order to minimise the amount of construction vehicles using the public highway, the following factors will be considered:

- Recycling of materials on site, where possible; and
- Preparation of a site waste management plan.

3.4.20 All construction traffic entering and leaving the site will be closely controlled. Vehicles making deliveries to site or removing spoil or demolition material etc, will travel via designated routes, which will have been previously agreed with CBC.

3.4.21 Deliveries will be phased and controlled on a 'just in time' basis, all being clearly marked to show their destination. This will minimise travel time around the site and any associated noise.

3.4.22 Site management and workers will be encouraged to travel to the site by public transport. The use of public transport for workers will be considered during pre-tender discussions.

Monitoring and Environmental Management of the Construction Works

3.4.23 Full assessments of the likely significant effects of the construction works on air quality, noise and vibration are presented in **Chapters 10** (Air Quality) and **11** (Noise and Vibration) respectively.

3.4.24 In summary, the following measures will be adopted:

- Choice of methodologies to minimise generation of noise, vibration and dust, for example the use of cutting rather than breaking in order to reduce the transfer of vibration;
- Use of hoardings for as long as practicable to provide acoustic screening; requirement to be confirmed by acoustic consultant;
- Requirement for engines to be switched off on-site when not in use, use of quieter plant, regular plant maintenance, screening of plant (if appropriate);
- Effective wheel/body washing facilities to be provided and used as necessary;
- A road sweeper will be readily available whenever the need for road cleaning arises;
- Vehicles carrying waste material off-site to be sheeted;
- Under no circumstances will fires be allowed on the site; and
- Special provisions will apply for any materials containing asbestos. The safety method statement will outline the control measures necessary to minimise the risks to an acceptable level, and all statutory notices will be placed with the Health and Safety Executive.

Application Site Drainage and Effect on Water Resources

3.4.25 The assessment of potential effects of the Proposed Development on water resources is presented in **Chapter 12** (Hydrology, Drainage and Flood Risk). The potential effects on water resources during demolition and construction are likely to include:

- Water demand for construction activities and domestic use by the contractor (however, this is anticipated to be low);
- Generation of domestic foul effluent by contractors;
- Increase in rate of run-off due to creation of impermeable areas for contractor's site facilities, construction of the new buildings and clearance of areas of vegetation; and
- Risk of pollution of run-off and groundwater due to construction activities.

3.4.26 Surface drainage will be attenuated where required and any required discharge arrangements will be agreed with the Environment Agency and Lead Local Flood Authority or, in the case of discharges to sewer, Severn Trent Water. Construction vehicles parking areas may need to be paved.

3.4.27 The Applicant or their Contractor will ensure that any water which may have come into contact with any contaminated materials during construction will be disposed of in accordance with the Water Resources Act (1991) and other legislation, and to the satisfaction of the Environmental Agency or Severn Trent Water. In addition, any risk will be reduced by adopting good management practices and relevant measures described in the Environment Agency's Pollution Prevention Guidelines, including:

- PPG01 – General Guide to the prevention of water pollution; and
- PPG06 – working at construction and demolition sites

3.4.28 All liquids and solids of a potentially hazardous nature (for example diesel fuel, oils, asbestos and solvents) will be stored on surfaced areas, with bunding, to the satisfaction of the Environment Agency.

Waste Management, Recycling and Disposal

3.4.29 Waste will be generated during all stages of the construction works. Major sources of waste within the construction process include:

- Demolition spoil – concrete, brick rubble, steel, aluminium, plastics, wood etc.;
- Packaging – plastics, pallets, expanded foams etc;
- Waste materials generated from inaccurate ordering, poor usage, badly stored materials, poor handling, spillage etc; and
- Dirty water, for example from silt.

3.4.30 All relevant contractors will be required to investigate opportunities to minimise waste arisings at source and, where such waste generation is unavoidable, to maximise the recycling and reuse potential of demolition and construction materials. Wherever feasible, such arisings will be dealt with in a manner that reduces environmental impact and maximises potential re-use of materials. Recycling of materials will largely take place off-site where noise and dust are less likely to result in impacts to the occupants of surrounding properties.

3.4.31 For those materials removed from the site, notification by the Contractor/Construction Manager for approval (via consultation with the authorities) will take place. Loads will only be deposited at authorised waste treatment and disposal sites. Deposition will be in accordance with the requirements of the Environmental Agency, the Environmental Protection Act 1990, the Environmental Protection (Duty of Care) Regulations 1991, the Controlled Waste Regulations 1992, the Landfill (England and Wales) Regulations 2002 and the Landfill (England and Wales) (Amendment) Regulations 2004, Hazardous Waste (England and Wales) Regulations 2005 and the List of Wastes (England) Regulations 2005.

3.4.32 To prove the correct depositing of excavated material and to prevent the occurrence of fly-tipping, a waste transfer note (WTN) system will be used in accordance with the Environmental Protection (Duty of Care) Regulations 1991. All contractor/sub-contractors will hold a current waste carriers licence and will operate a WTN system, to confirm that each load is received at the approved licensed waste management disposal site. Copies of the WTN are to be provided to the nominated manager, and available for inspection at the Application Site. In addition, direct routes via motorways/main roads to designated tips will be agreed with the sub-contractors.

3.4.33 No burning of demolition or construction waste will be undertaken on the Application Site. Building materials containing asbestos will be fully assessed in advance of demolition works commencing. Any identified asbestos will be removed by a licensed contractor in accordance with the relevant legislation and regulations.

3.4.34 In addition to the usual waste associated with a normal construction project, there will also be contaminated materials from the ground and possibly contaminants or hazardous materials found during demolition. The control, handling and disposal of these materials will require special attention and specific procedures will provide the detailed requirements necessary. This is considered in **Chapter 13** (Ground Conditions) to this ES.

Protection of Trees and Vegetation

3.4.35 Provision in BS5837: 2012 will be followed during the construction of the Proposed Development. All trees to be retained will be protected from any unnecessary damage.

3.4.36 All temporary material storage will be located wherever practical at adequate distances from vegetation and tree cover to avoid any physical damage. Where tree roots may be subject to potential vehicle compaction, additional temporary protection of the ground surface may be introduced.

Demolition and Decommissioning

3.4.37 While it is anticipated that the Proposed Development will exist well beyond its design life of 60-120 years (including refurbishment) it may ultimately require subsequent redevelopment. Such demolition would comply with all the legislative requirements and codes of practice pertaining at that time.

4 ALTERNATIVES

4.1 INTRODUCTION

4.1.1 This chapter of the ES sets out the reasonable alternatives to the Proposed Development that have been considered by the Applicant and the reasons why these were rejected.

4.2 ALTERNATIVES CONSIDERED

4.2.1 The EIA Regulations (Schedule 4, Part 2) require for inclusion in an ES:

> ***"A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects"***

4.2.2 The main alternatives to the Proposed Development which the Applicant has studies include:

- The 'No Development' Alternative; and
- Alternative Designs.

The 'No Development' Alternative

4.2.3 The 'No Development' Alternative refers to the option of leaving the Application Site in its current use and physical state. Although this option would avoid the potential adverse effects associated with developing greenfield land such as the loss of agricultural land, it would also miss out on the opportunity to provide up to 250 residential dwellings in a range of types and tenures in a sustainable location.

Alternative Designs

4.2.4 The constraints and opportunities presented by the Application Site have been utilised to inform and structure the development proposals. The constraints and opportunities are as follows:

Constraints

- Main vehicular access from Harp Hill;
- Existing hedgerows and trees;
- Adjacent residential amenities and listed structures;
- Existing site levels;
- Retain existing significant and specimen trees, hedgerows and other landscape features;
- Provide a landscape buffer along the southern slopes of the site to protect long distant views from the Cotswold escarpment and views from dwellings on Harp Hill;

Protect and maintain the routes of the existing public rights of way running along the boundaries of the site;

- Maintain views across the scheme from Harp Hill towards the Cotswold Escarpment; and

- Contain built development within the northern portion of the site where the topography is lower.

Opportunities

- Provision of sustainable development which can accommodate up to 250 dwellings (including affordable housing) supported by amenity space and new infrastructure;

- Enhance footpaths and cycleways within the Application Site and provide linkages with existing routes;

- Enhance ecological habitats;

- Provision of amenity green space, informal open space and play areas;

- Provide appropriate Sustainable Drainage Systems and attenuation areas;

- Reduce greenhouse gas emissions through location of residential development near to existing services that reduce the need to travel, promotion of sustainable transport options and cycle / pedestrian linkages, and consideration of green infrastructure, ecological enhancements and SuDs to provide resilience to climate change.

- Make efficient use of land through the application of appropriate densities;

- Opportunity to create quality architecture that takes cues from locally desirable vernacular, considers local design guidance and responds positively to the surrounding character of adjacent built form and its AONB location;

- Provide green infrastructure enhancements that build positively upon the local character and existing landscape structures and integral part of the development;

- Provide new connections including pedestrian access points and new footpath roots that provide access to land that was not previously publicly accessible;

- Create a new woodland belt that will provide biodiversity enhancements an improvements to the local Green Infrastructure Network; and

- Create publicly accessible playspaces for the benefit of new and existing residents within the local community.

4.2.5 The early designs have evolved with due regard to feedback received during the public consultation exercise, consultation with CBC and various statutory consultees and inputs from the various technical consultants. The elements that have fed into the evolution of the Proposed Development and main alternative designs in the formation of the Proposed Development are summarised in the **Design and Access Statement.**

4.2.6 The Illustrative Masterplan at **Figure 4.1** illustrates one way in which the Application Site could be developed based on the stipulated parameters (**Figure 3.1 – 3.4)** that have been subject to EIA as reported in this ES.

5 SOCIO - ECONOMICS

5.1 INTRODUCTION

5.1.1 This chapter identifies the likely significant socio-economic effects of the Proposed Development.

5.1.2 The considerations of this chapter are most commonly related to the effects of the Proposed Development upon the human population who will live, work and/or use the facilities in the Proposed Development and in the local area. This is achieved by examining the potential effects on the population anticipated as a result of the Proposed Development and, in turn, assessing the effect that this could have on relevant services and facilities, including education, healthcare, recreational facilities and job creation. The assessment enables consideration to be given to the ability of existing social infrastructure and that proposed by the development to accommodate the additional population and identifies the extent to which additional demands will be placed on existing facilities. Where additional demands will be generated the methods of mitigation are identified and the residual effects assessed.

5.2 ASSESSMENT APPROACH

Methodology

5.2.1 There is no specific guidance available which establishes a methodology for undertaking an EIA of the socio-economic effects of a Proposed Development. Accordingly, the approach adopted for this assessment is based on professional experience and best practice, and in consideration of the policy requirement/tests set out within the National Planning Policy Framework (NPPF), and the extant and emerging development plan.

5.2.2 The assessment considers the potential effects of the Proposed Development relative to the future baseline position rather than the current baseline position. This ensures that the potential effects are considered relative to the position that is likely to arise should the Proposed Development not occur.

5.2.3 The baseline information has been collated with reference to the following:

- National Planning Policy Framework February 2019
- Gloucester, Cheltenham and Tewkesbury Joint Core Strategy 2011- 2031 Adopted December 2017
- Department for Communities and Local Government (DCLG) data (various outputs as individually referenced within this chapter);
- Office of National Statistics (ONS) data (various outputs as individually referenced in this chapter);
- Information obtained from the client and the council with regards to the current land use, neighbouring activities and site characteristics.

Assessment of Significance

5.2.4 Given the nature of the socio-economic factors under consideration, it is not considered appropriate to assign a 'sensitivity of receptor' scale. Accordingly, a qualitative assessment of the likely significance of socio-economic effects has been carried out and significance rating assigned in accordance with the matrix and associated commentary set out in **Table 5.1**.

Table 5.1 Significance Matrix

Magnitude of Change	Sensitivity of Receptor				
		High	**Medium**	**Low**	**Negligible**
	High	Major	Major	Moderate	Negligible
	Medium	Major	Moderate	Minor to Moderate	Negligible
	Low	Moderate	Minor to Moderate	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Legislative and Policy Framework

5.2.5 Guidance on producing EIAs published by the European Commission and UK Government suggests that the possible socio-economic effects that should be considered are those relating to changes in population, such as changes in the demand for housing and services such as schools and recreation facilities.

5.2.6 The NPPF (2019) provides the Government's planning policies for England and how these are expected to be applied. Paragraph 8 sets out the overarching planning objectives on how to achieve sustainable development. It identifies how local planning authorities should plan for sustainable development within their area and across local boundaries and emphasises the three interdependent roles of sustainable development:

> **"An economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;**
>
> **A social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and**
>
> **An environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy".**

5.2.7 The NPPF 2019 requires that Local Planning Authorities have an up-to-date Local Plan in place. These Local Plans should set out the visions and aspirations of local communities, and provide for the sustainable development required to support these ambitions.

Scoping Criteria

5.2.8 The scope and contents of this socio-economic assessment are based on professional experience and best practice as well as the Scoping Opinion issued by the Local Planning Authority.

5.2.9 Consideration has been given only to those socio-economic factors for which there is a potential for likely significant effects or which are relevant to assessing these effects. Different factors are considered in the baseline assessment and during the construction and operational phases of the Proposed Development as identified in **Table 5.2**, owing to the likelihood of effects over these phases.

Table 5.2: Socio-economic Factors

Factor	Baseline Assessment	Likely significant Effects during the Construction Phase	Likely Significant Effects during Operational Phase
Population	✓		✓
Deprivation	✓		✓
Economy	✓	✓	✓
Skills and Qualifications	✓		✓

5.2.10 Consideration has been given to the potential effects at a local, district and where relevant, national scale.

Limitations to the Assessment

5.2.11 Baseline information is derived from the latest available statistics, however, there is often a time-lag associated with the publication of this data and this needs to be recognised.

5.2.12 The primary source for identifying the socio-economic profile of an area is the 2011 Census. Due to the size of the settlement, economic analysis provided in this chapter varies in terms of scale used. This is primarily due to the availability of the data at the local level. Therefore, some of the analysis should serve as a proxy in identifying the potential benefit trend across the area assuming its wider radius.

5.2.13 The following assessment assumes full occupancy without factoring potential economic downturns or external factors with a potential to impact on the occupancy rates.

5.3 BASELINE CONDITIONS

Site Description and Context

5.3.1 The site is situated to the north east of Cheltenham town centre. The site is bounded on three sides, to the south, west and north by existing residential development and to the east by the listed structures of Hewlett's Reservoir. The site is bounded to the south by Harp Hill Road and to the west by Wessex Drive both of which are established residential areas.

5.3.2 The proposal seeks outline planning permission for a development comprising up to 250 dwellings, associated infrastructure including open space and landscaping, with vehicular and pedestrian accesses from Harp Hill, demolition of existing buildings.

5.3.3 The Proposed Development is located within the Battledown Ward. The site is situated in the Cheltenham 012A Lower Super Output Area.

Baseline Survey Information

5.3.4 This section examines some key characteristics of the local area. The Application Site is situated to the north east of Cheltenham town centre on the lower slopes of the Cotswold Scarp at Oakley and runs along Harp Hill Street. The site is situated within the Battledown Ward.

Population

5.3.5 The 2001 Census (ONS) identifies a population of 110,732 people for Cheltenham District Council. The population increased by 4.9% over the decade to 115,732 people (2011 Census) and is forecasted to increase to 123,996 by 2028 (2016 based subnational population projections). In 2011, 5,460 people were resident in the Battledown ward.

5.3.6 Youngest age group (0-15 years of age) proportion in Cheltenham (17%) is slightly below than the figures at the regional level (17.6%) and substantially below national level (18.9%). At the ward level (20.2%), there is a highest proportion of the school age population when comparing to the above areas. Working age population (16-64 years of age) in Cheltenham comprises of 66.3%. This is above the proportions at the regional (62.8%) and for England and Wales (64.7%). It is also slightly above the ward level proportions (63.4%). In addition to the above, the district's elderly population (65 and above) is 16.7% which is broadly in line with ward level data (16.4%) as well as the values for England and Wales (16.4%) and higher than the values at the regional level (19.6%).

5.3.7 Considering the above, there is a healthy working age population proportion in Cheltenham with a school age population falling below the regional and national values. This indicates that in the future it can be expected that there will be a small increase in the ageing population in Cheltenham, what is in line with the trends at the regional and national levels.

5.3.8 The 2011 ONS data also reveals that the working age population accounts for 66.3% of the population with a high proportion of older (16.7% of the population are 65 or older) and a small proportion of younger people (15.9% of the population are 0-15 years of age).

5.3.9 The 2016 subnational population projections (ONS) indicate a District population of 123,556 by 2031 in Cheltenham what represents an overall increase of 5,524 people from the base date of the most recent Census assessment (2011). The 2016 subnational population projections project the future age structure of the Cheltenham District, assuming trends continue as presented in the table below.

Table 5.3: Projected Age Structure of Cheltenham

	Age Structure in 2019	Age Structure 2028	Change
Pre-school (0-4)	6,471	6,169	- 303
Primary school (5-10)	8,064	7,599	- 465
Secondary school (11-17)	9,287	10,230	943
Working age (18-64)	71,733	70,570	- 1,164
Older (65+)	22,916	29,429	6,513

5.3.10 The above table indicates a very strong increase in the senior age group as well as moderate growth in secondary school population. There is also a decrease across preschool and primary school population, with the largest decrease being noted in the working age population (-1,164).

Deprivation

5.3.11 The Index of Multiple Deprivation 20151 provides an indication of the average levels of deprivation for LSOAs (Lower Super Output Area) across England. The Index combines information on seven 'domains' to provide an overall indicator of the economic and social well-being of a particular area. The seven indicators are:

- Income;
- Employment;
- Education, skills and training;
- Health deprivation and disability;
- Crime;
- Barriers to housing and services; and
- Living environment.

5.3.12 At a district level, the overall ranking for Cheltenham is 228 out of 326 local authorities with 1 indicating the most deprived local authority and 326 the least deprived. The District therefore falls within the second quintile of all authorities nationally in terms of overall deprivation.

5.3.13 Deprivation levels are recorded at the level of Lower Super Output Areas (LSOAs), which are generally smaller than wards. LSOA that covers the site area (Cheltenham 012A) is ranked 30,950 out of 32,844 LSOAs in England what means that the area is within 10% least deprived areas across the country. Nevertheless, the area adjoins Cheltenham 006C (ranked 4,629) and Cheltenham 006B (ranked 7,651), considered to be in 20% and 30% most deprived wards nationally.

[1] September 2015, English Indices of Deprivation 2015, Department for Communities and Local Government.

Housing

5.3.14 Gloucester, Cheltenham and Tewkesbury Joint Core Strategy Adopted December 2017 sets out a vision for the area up to 2031. Policy SP1: The Need for New Development sets out the need for approximately 35,175 homes across all three authorities, with 10,917 dwellings to be delivered exclusively in Cheltenham.

5.3.15 The NPPF requires that a Local Planning Authority maintains a rolling supply of deliverable housing land to provide for the objectively assessed need for the following five years. It also requires that sites or broad locations are identified to ensure sufficient capacity for housing in years 6-10 and where possible 11-15. The five-year land supply ensures that the current and imminently arising future needs for housing are addressed. Where there is an insufficient land supply, the needs for housing will not be being planned for and further sites will need to be brought forward to address this.

5.3.16 Cheltenham Borough Council has updated its Five-Year Housing Land Supply position in December 2019. The document identifies that Cheltenham Borough Council is not able to demonstrate a five year supply of housing land as it has 3.7 years' worth of supply.

5.3.17 The ratio of house prices to earnings provides a measure of the affordability of housing within an area. In 2018, the lower quartile house price was less affordable at 8.6 times the lower quartile workplace based income in Cheltenham as compared to 7.18 times across England and Wales. This indicates that the area is slightly more affordable for lower earners. Consequently, the median house price to median income ratio indicates that Cheltenham (8.97) was less affordable than England (7.83) for average earners. The median annual workplace-based salary across the Cheltenham Borough Council (£29,625) is marginally below the national figures (£29,686), with median house values in Cheltenham (£265,750) above the national values (£232,500).

Educational Capacity

5.3.18 Local Education Authorities (LEA) have a statutory duty to secure sufficient school places within their area. The school that any particular child attends is a matter of parental choice subject to availability of capacity at the selected school. It is always subject to the overriding requirements of any published admission criteria that the school has, as well as the appeals procedure for individual pupils.

5.3.19 There are 9 primary schools within the closest vicinity of a 2 mile radius. The site is situated in a closest proximity to the Holy Apostles school. The facility is located 0.6miles walking distance from the site.

5.3.20 Overall, there are 144 spaces available across all 10 of the primary school facilities within a 2-mile radius of the Oakley Farm site. This distance is considered to be a maximum statutory walking distance for the pupils accessing the primary education facilities as set out by the Department for Education[2].

5.3.21 In addition to the above, there are five secondary school facilities within the statutory 3- mile distance from the site. It is noted that some of the facilities operate above its capacity (Balcarras Academy and Pitville School) however the assessment indicates a net capacity of 165 places for new students.

[2] Department for Education, Home to school travel and transport guidance- statutory guidance for local authorities, July 2014.

Healthcare provision

5.3.22 Cheltenham General Hospital is the closest major medical facility, situated 1.6 miles distance from the site. It provides general hospital services. Cheltenham has state-of-the-art critical care facilities and is home to the specialist Oncology Centre as well as breast screening facilities at the Thirlestaine Road clinic. This thriving hospital also has a new Interventional Radiology operating theatre, surgical robot used in treating prostate cancer and provides a wide range of outpatient services.

5.3.23 The closest health care facility to the site is Sixways Clinic Surgery. It is located approximately 0.9-mile walking distance from the site.

5.3.24 The table below provides an overview of the practice size and the patient number for the surgeries identified above. This gives an indication as to whether there is a capacity for existing surgery to absorb additional patients having regard to the number of patients per GP.

5.3.25 The Centre for Workforce Intelligence3 identified that across England in 2013, there were an average of 5.96 GPs per 10,000 patients. These translate to between 1,620 and 1,680 patients per GP.

Table 5.4: GP Surgery Capacity

	Nr of GPs	**Nr of patients on roll**	**Nr of GPs required to sustain patients on the roll**
Sixways Clinic	7	10,900	6.6
Berkeley Place Surgery	5	8,689	5.3
The Royal Crescent Surgery	5	7,806	4.7
Crescent Bakery Surgery	4	5,341	3.2
Yorkleigh Surgery	4	8,893	5.4
Overton Park Surgery	10	12,182	7.4
The Royal Well Surgery	6	6,793	4.1
The Corinthian Surgery	6	8,334	5.1
St Catherine's Surgery	7	9,452	5.7
Total	**54**	**78,390**	**47.5**

5.3.26 Overall figures indicate 78,390 patients enrolled across all of the GP facilities within a 2-mile radius. According to the figures identified above, there are on average 1,650 patients per GP across the country. Across the above GP surgeries there is a surplus of 6.5 GPs across the area. There is therefore an existing surplus of GPs in the area.

5.3.27 The nearest dental surgery is Hewlett Road Dental Surgery located along the Hewlett Road and the closest pharmacy is Badham Pharmacy Ltd, located on Whaddon Road, a short walk from the site.

[3] July 2014, In-depth review of the general practitioner workforce, Centre for Workforce Intelligence on behalf of the Department of Health.

Economy and Employment

5.3.28 Economic activity (the proportion of the working age population either in work, self-employed or actively looking for work) in Cheltenham at 82.7% is slightly above to the trends at the regional level (81.3%), and slightly above the values for England and Wales (78.6%) (Annual Population Survey 2018, ONS).

5.3.29 The unemployment rate across the working age population is low (1.9% of the working age population) when compared with trends across the South East (3.5%) and England and Wales (4.3%).

5.3.30 In terms of the earnings, an average median weekly resident based gross pay in Cheltenham in 2018 was £623.6. It is slightly above the values at the regional level (£614.5) as well as above the values for England and Wales (£572.0) (Source: Annual Survey of Hours and Earnings 2018, ONS).

Community facilities

5.3.31 Battledown area is currently served by a number of community facilities (in addition to the educational and health care facilities identified previously. There are Oakley Community Centre and the Cornerstone Centre, as well as Parklands Centre situated a bit further outside. All of these are located within a 2-mile radius from the site. The closest library is the Library Services for Education situated by the Oakley Community Resource Centre.

Open space

5.3.32 Policy C12: 'Sports and open space provision in new residential development' of the emerging Local Plan sets out the sports and open space contribution the Council expects the new development will provide. The policy states the provision should be sought in accordance to the Social, Sport and Open Spaces Study- Developer Contributions Toolkit (2017). The document further refers to the Cheltenham Borough Council Open Space Study Standards Paper November 2016, which sets out how quantity standards can be calculated for Cheltenham. Council provides an extensive assessment of the leisure facilities in Cheltenham. These are summarised in the table below.

Table 5.5: Open Space Standards for Cheltenham

Provision	Proposed Standard (ha per 1,000 people)
Parks and Gardens	0.59
Accessible Natural and Semi Natural Green Space	0.24
Amenity Green Space	1.15
Provision for children and young people	0.04
Allotments	0.25

Summary of baseline conditions

5.3.33 The baseline survey assessment indicates that Cheltenham has larger proportion of working age population when compared regionally and nationally. Considering data from 2016 based subnational population projections, it is expected that the working age population will be declining, and overall population trend will be strongly shifting towards

ageing population in the District, with an increase of 6,513 people in the 65+ age group by the end of the Local Plan period.

5.3.34 In terms of the earnings, the average median weekly gross pay in Cheltenham is £623.6. This is above the regional and national figures. In addition to this, Index of Multiple Deprivation 2015 shows that the District has low levels of deprivation at the District level. The Local Authority is ranked 228 out of 326 local authorities with 1 indicating the most deprived local authority and 326 the least deprived one. The area under consideration (situated within LSOA Cheltenham 012A) is ranked within 10% least deprived areas across the country. Cheltenham also has a very small level of unemployment, with only 1.9% of the people unemployed in the area, compared to 4.3% nationally.

5.3.35 Battledown area is adequately served when considering the primary and secondary school capacities, with several places available for the new students across both institutions. There are a number of GPs and healthcare providers in the direct vicinity or within a close drive from the site with the analysis indicating a good level of provision and a net positive capacity, leaving a room for new patients in some of the facilities. The area is served by a range of services including dentists and pharmacies that cater for the existing population. It further offers a good exposure to the community and retail facilities in the closest vicinity as well as a bit further in the centre of Cheltenham.

5.4 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

5.4.1 The Proposed Development comprises up to 250 residential units, vehicular access from Harp Hill and open space and landscaping.

Construction

Housing

5.4.1 The delivery of homes throughout the construction phase will respond to the need for housing that currently exists. Delivery will be responsive to demand and so the specific needs will be able to be responded to in a flexible way, subject to any planning conditions.

5.4.2 The delivery of appropriate housing at appropriate times to meet district wide needs will support the objectives within the Local Plan, and this is therefore considered a **moderate beneficial effect** given the scale of the development.

Economy

5.4.3 The estimated construction costs for each element of the Proposed Development are taken from the BCIS database and based upon the median cost within the Dorset area, as follows:

- The provision of 250 dwellings is estimated to cost circa £29.8M based on the average floorspace of new dwellings identified in the English Housing Survey (87m^2).
- The provision of the access road and associated vehicular network costs are unknown but are likely to be significant. The construction process will involve additional workforce in the development process.
- The landscaping associated work is also unknown however it is expected that some workforce will be required to deliver this element of the proposal.

- The above figures produce an estimated construction cost of £29.8M as an absolute minimum.

5.4.4 The average turnover of an individual construction worker across the South West region[4] can be applied to the construction costs. This average turnover is £108,946 per worker which results in circa 274-person years of construction employment arising from residential and employment element of the Proposed Development. It is assumed that the construction of the Proposed Development will last three years. The jobs that provide for this employment will fluctuate, but it is reasonable to assume that on average the development will support circa 91 construction jobs to build the proposed residential units and employment element, assuming a 3 year development period.

5.4.5 The Scottish Government produced analysis on employment multipliers in 2011[5], which identify that for every 1 direct construction job generated there would be an additional 0.7 indirect jobs (in the supply chain) and 0.4 induced jobs (supporting the supply chain) generated. Whilst this rate reflects employment within Scotland rather than England, no comparative analysis is available in England and the rates are assumed to be broadly consistent across the UK. Using this information, the Proposed Development would support an additional 64 indirect jobs and 36 induced jobs, in addition to the 91 direct jobs. A proportion of these jobs will be maintained once the development is complete to support future development across the area and/or the newly arising population. The proposal involves provision of the vehicular access, demolition of the existing building and landscaping. At this point, the proposed costs are insufficient to estimate the amount of workforce that will be required to deliver these.

5.4.6 Additional benefit to the economy would also occur during the construction period with expenditure on local goods and services.

5.4.7 The generation of jobs within the construction sector during the construction phase and beyond is considered to be a **moderate beneficial effect** to provide the economic growth required by the NPPF[6] and the objectives of the Local Plan.

Operation

Population

5.4.8 The Proposed Development provides up to 250 dwellings. Assuming the average number of persons per dwelling (of 2.27) identified in the household composition analysis for Cheltenham in 2011 Census, the Proposed Development of approximately 250 dwellings would accommodate at least 568 people.

5.4.9 Some, but not all of the population growth will be new to the area as some households will move from within the wider area. Many of these will release their previous homes to the market which in turn will be occupied by new households and so generate additional population within the wider area although not on the site. However, some people moving within the area will not release a previous property to the market (i.e. first time buyers, household separations etc.) and so will not have any implications on the population within the area.

[4] November 2017 Business Population Estimates 2018, Department for Business, Innovation and Skills
[5] August 2014, Employment Multipliers Input Output Tables, The Scottish Government
[6] February 2019, The National Planning Policy Framework, Department for Communities and Local Government

5.4.10 The National Association of Estate Agents monthly reports[7] indicate that somewhere between 22% and 32% of all purchases are made by first time buyers. If it is assumed that 25% of market housing is occupied by existing residents, circa 62.5 of the 250 dwellings would provide for the existing population without releasing an existing property. Furthermore, assuming the proposal is policy compliant (as set out in the Joint Core Strategy 2017), the proposal will deliver 40% of affordable housing. This housing stock will be occupied by the local residents. It is therefore expected that the proposal will provide 100 affordable dwellings. Therefore the remaining 87.5 of the 250 dwellings in the Proposed Development would provide for people new to the area (even if further along the housing market chain). This translates to circa 199 new people.

5.4.11 The Proposed Development of 250 new dwellings will therefore provide for approximately 199 people new to the local population.

5.4.12 The Proposed Development is considered to be a **moderate beneficial effect** in terms of the resulting age of the population, as in principle, any development will help to support a younger population that will support the economy of the local area.

Deprivation

5.4.13 The small areas within which the Application Site lie has low levels of overall deprivation although the District suffers from pockets of deprivation. The Proposed Development will provide housing and associated infrastructure. Given that, the Proposed Development is considered to have a **neutral effect**.

Housing

5.4.14 Gloucester, Cheltenham and Tewkesbury Joint Core Strategy Adopted December 2017 sets out a vision for the area up to 2031. Policy SP1: The Need for New Development sets out the need for approximately 35,175 homes across all three authorities, with 10,917 dwellings in Cheltenham.

5.4.15 The provision of housing to contribute to existing and newly arising levels of demand will alleviate house price rises and the deterioration of the affordability of housing. The impacts of individual residential schemes on house prices is however negligible.

5.4.16 The delivery of homes to maintain a continuous supply of housing, to alleviate house price rises and to meet the specific needs of the population is considered a **moderate beneficial effect** of the Proposed Development.

Educational Facility

5.4.17 The Proposed Development will result in the increase of the number of children accessing the existing educational facilities in the area. The local analysis identifies nine primary schools within a 2 mile radius, as identified in the paragraph 5.3.5 of this chapter. These are set out in the table below.

[7] January- December 2017, National Association of Estate Agents Housing Market Report, National Association of Estate Agents

Table 5.6: Primary School Capacity

School	Overall Capacity	Number of students enrolled for 2018/19 school year
Berkhampstead School	288	261
Oakwood Primary	420	337
Dunalley Primary School	420	410
The Catholic Primary and Nursery School of Saint Gregory the Great	420	415
Naunton Park Primary School	399	394
Prestbury St Mary's Church of England Junior School	240	238
Holy Apostles Primary School	210	210
St John's Primary School	203	197
Holy Trinity Church of England Primary school	210	204
Total	**2,810**	**2,666**

5.4.18 It is broadly estimated that the Proposed Development will be occupied by 568 people. This will include additional school aged children and will therefore have implications for local education provision. It is difficult to accurately estimate the number of children that will occupy these dwellings. This is because some children will arrive as migrants to the town, whilst others will move to the site from other existing residential areas in the town, although these will often be replaced by other families with school aged children in the vacated properties.

5.4.19 Nevertheless, the primary school capacity analysis identifies availability of 144 placements across the existing primary school facilities. This represents 25% of the population through the Proposed Development and is more than the existing proportion of the primary school population as identified in the paragraph 5.3.6 of this chapter. Existing population breakdown identified in the paragraph 5.3.6 identifies that 20.2% of the population in Battledown Ward is in the 0- 15 age group. It is therefore possible that the newly arisen children population will be accommodated across the local educational facilities.

5.4.20 In terms of the secondary school provision, the analysis identifies three institutions within 3-mile distance from the site. Number of students in some of these institutions is currently above the identified capacity. This is visible in case of Pitville School and Balcarras School. Nevertheless, there is a number of available places across the Cheltenham Bournside School. In addition to this, it is expected that the proposed development of a secondary school at Farm Lane/Kidnappers Lane will be delivered in 2021. The school will have six forms of entry providing for approximately 900 pupils which will ease the existing pressure on the secondary school provision across Cheltenham. The proposed secondary school is expected to be opened and operational by September 2021. In year one of opening only Year 7 will be operating, each subsequent year a further academic year of intake will be added until it reaches full capacity in year 2026. The opening of this new secondary school is prior commencing the Oakley Farm development. According to the lead in times, it is expected that the first dwellings of the proposed development at Oakley Farm will be delivered in summer 2022 at earliest. The dwellings will be occupied in the subsequent months, and therefore it can be expected that the new population will move into the area around autumn 2022. By this time, it is expected that the school will have a fully operational classes for Year 7 and Year 8, totalling at around 360 pupil spaces. Following year will see an addition of subsequent years, until reaching a full capacity in 2026. Using lead in times provided by the applicant, it is expected that the proposal will be fully completed in autumn 2025.

5.4.21 At the same time, given lack of housing mix of the proposed development and future age composition in the area, it is not possible to establish a number of students in 2025 that will require a placement in Year 11.

5.4.22 It is therefore not possible to accurately calculate whether there might be a shortfall, particularly in case of the oldest students. It is considered that appropriate measures should be considered to address any shortfalls arising in the future. These could be set out in the subsequent stages of the planning application process. Subject to the above, it is expected that there will be a sufficient capacity to accommodate secondary school population arising from the proposed development.

5.4.23 As in case of primary school analysis, the composition of the population arising from the proposal is unknown, nevertheless it can be expected that proportion of the new population will be requiring a school provision.

5.4.24 To conclude, there is a sufficient number of primary school places within a 2- mile radius from the site. At the same time, there is a limited capacity of secondary schools in the area, nevertheless this is expected to change due to a proposal to develop a six form entry secondary school for approximately 900 students. The Proposed Development is therefore considered to provide a **neutral effect** on the local educational facility provision.

Health Care

5.4.25 With the anticipated increase in population by 568 new people, the Proposed Development would create a demand for 0.34 GPs, based on the rates identified by the Centre for Workforce Intelligence[8]. The baseline survey information section identifies an existing surplus of 6.5 GPs across the area. Additional people in the area will result in the increase of the pressure on the existing services, nevertheless, as identified, there is a sufficient capacity to accommodate the increase in the population resulting from the proposed development.

8 July 2014, In- depth review of the general practitioner workforce, Centre for Workforce Intelligence on behalf of the Department of Health.

5.4.26 It is therefore considered that the proposed development will have a provide a **neutral effect** on the local healthcare provision.

Economy and Employment

5.4.27 The Proposed Development will support local jobs in the construction sector. As identified, the residential and employment element of the proposal will provide circa 91 construction jobs throughout the 3-year construction phase, 64 indirect jobs and 36 induced jobs. Some of these may persist following the construction phase, in developments elsewhere. It is expected that the workforce will be sought locally. There will also be maintenance and service jobs associated with the Proposed Development once this is complete.

5.4.28 Due to the increased population occupying residential units, it might be expected that there will be increased use of the local facilities and higher level of the overall expenditure in the area.

5.4.29 Given that, the Proposed Development is considered to have a **minor beneficial effect**.

Community Facilities

5.4.30 The Proposed Development will increase the local population and spending power in Battledown area to the benefit of local facilities and those in the wider area. The provision of additional housing growth will support the viability of shops and services, including leisure facilities through additional local spending. Indeed, the ONS Family Spending dataset identifies that the average household spent £572 per week in the South West region in the financial year ending 2018. This would indicate that the 261 households (who would be expected to be accommodated in the proposed 250 dwellings) in the Proposed Development would spend approximately £7.8M annually. Out of these, 91 households will be comprising new population. Therefore, it is estimated that the Proposed Development will add £2.7M expenditure annually.

5.4.31 The proposal also involves an improved residential infrastructure and is therefore considered to have a **minor beneficial effect**.

Open Space facilities

5.4.32 The Proposed Development will result in delivery of 250 new dwellings, a vehicular access and open space with additional landscaping. Therefore, a proportion of the land will be allocated for a green infrastructure.

5.4.33 Cheltenham Borough Council Open Space Study Standards Paper November 2016 summarises open space requirements guiding new developments in the area, as set out in the Table 5.7 of this chapter. The document states that for the purpose of open space calculations, a national occupancy rate of 2.3 persons per household is used for Cheltenham. Using these densities and applying them into the anticipated population arising from the development, it is expected that the proposal will require a total of 1.31 ha of the open space provision.

5.4.34 Table below provides a requirement of the open space provision for the proposed scheme of 250 dwellings, breaking it down into each category.

Table 5.7: Standard for open space: quantity and access

Open Space Typology	Recommended Requirement set out in the Open Space Standards Paper (ha/ 1000 people)	Requirement to support 250 dwelling development (in ha)
Parks and Gardens	0.59	0.34
Accessible Natural and Semi Natural Green Space	0.24	0.14
Amenity Green Space	1.15	0.66
Provision for children and young people	0.04	0.02
Allotments	0.25	0.14

5.4.35 It is therefore estimated that the proposed development will require a total of 1.31 ha of open space.

5.4.36 The proposed development includes a number of open space elements as a part of the development. The indicative masterplan provides broad locations of open space provision. Given the fact the application is in outline, the applicant does not provide a detailed breakdown of the open space typology provision.

5.4.37 Nevertheless, the proposed development provides a total of 8.8 ha of open space/ green space provision across the site.

5.4.38 The proposed development provides a total of 8.8 ha of open space/ greenspace across the site. Although the detailed breakdown of the open space type is not provided at this stage, it is considered to have a **neutral effect** on the open space across the closest vicinity.

Summary of assessment

5.4.39 The Proposed Development will result in the increased population in the area. This group will in principle include younger working age population. Due to the size and the quantum of the development is therefore anticipated that the development will have a **moderate beneficial effect** on the population in the area. Consequently, this will also have a **minor beneficial effect** on the deprivation in the area.

5.4.40 The Proposed Development will generate additional school aged children and will have implications on the education provision. The exact number of students the development is likely to generate is unknown at this stage. Subject to the fact that there is an existing capacity across the local educational facilities, it is expected that these will be able to absorb the future primary and secondary school population arising from the new development (as identified in the paragraphs 5.4.20 -5.4.23), resulting in a **neutral effect** on the local educational provision.

5.4.41 The Proposed Development will create a demand for 0.34 GPs, based on the rates identified by the Centre for Workforce Intelligence, as set out in the paragraph 5.4.24. The existing healthcare provision assessment identifies a surplus of 6.5 GPs in the area. It is anticipated that new population will result in a marginal impact on the area, nevertheless, considering the current capacity, this development is therefore expected to have a **neutral impact** on the local healthcare provision.

5.4.42 Although the Proposed Development is residential, it the construction phase will result in a creation of temporary positions in order to deliver the scheme. It is expected that the proposal will generate 91 direct full-time jobs sustained over the construction period and additional 64 indirect jobs and 36 induced jobs. This is considered to have a minor beneficial impact on the employment in the area. In addition to that, anticipated population will consequently lead to a higher level of the overall expenditure in the area, estimated at an additional £2.7M annually. The proposal will involve creating a number of temporary construction posts, what is considered to have a **minor beneficial impact** on the employment in the area.

5.4.43 The Proposed Development will increase local expenditure due to the new working age population, improve the pedestrian and road network as well as provide a good amount of open space provision.

5.4.44 The Proposed Development will provide a total of 8.8 ha open space against 1.31 ha requirement. Therefore, it is considered that the proposal has a **neutral effect** on the open space provision.

5.5 CUMULATIVE AND IN-COMBINATION EFFECTS

5.5.1 The cumulative effects of related developments are considered in order to establish whether the Proposed Development would in combination contribute to effects which may need to be mitigated. These are considered individually as follows:

- **GCHQ Oakley, Priors Road Cheltenham**- Outline planning approval granted under CB11954/439 (Approved October 1998), as varied by the extension at the time period for the submission of reserved matters to 15 years, as approved under 01/00637/CONDIT and confirmed under 09/01110/CLPUD. The outline permission was for residential development (20 ha) and provision of district centre incorporating food superstore (1.6ha). Due to the size of the development, the proposal is being delivered in phases.
- **Bouncers Lane Cheltenham Gloucestershire**- Outline application (17/00929/OUT) for up to 58 residential dwellings including access with all other matters reserved for future consideration (Approved October 2017).
- **Cromwell Court Greenway Lane Charlton Kings Cheltenham**- planning application (18/02581/FUL) for demolition of existing dwelling and construction of 8 x self & custom build dwellings with associated works and infrastructure, including sustainable drainage, new internal access roads, improvements to existing internal access road, site regrading and landscape planting (Approved March 2019).
- **Land East of Farm Lane, Leckhampton, Cheltenham, Gloucestershire-** planning application (19/01690/DEEM3) the construction of a new sixth form secondary school building, with a new all weather pitch, sports playing fields, a multi- use games area, onsite car parking and other associated works.

5.5.2 Some of the above permissions are being implemented at the moment. Therefore, at this point, it is assumed that the developments will deliver as a whole. On such basis, it is expected that the cumulative developments will result in 731 residential units, food superstore, open space, landscaping, vehicular routes and associated access.

[9] Reference 97/00818/PO is stated as an alternative reference for CB11954/43 on CBC's website although both refer to the outline permission granted in October 1998.

Population

5.5.3 The Proposed Development and related developments would generate total 1,593 population based on the average household to dwelling ratio from the 2011 Census[10].

5.5.4 However, many of these people will move from within the area and so will not be new to the population. Indeed, using the rates identified in paragraph 5.4.12 it is estimated that only 256 of the 731 new dwellings would provide for the new population. These would accommodate circa 557 people.

5.5.5 The effects on the population for the Proposed Development and related developments in any combination are broadly consistent as they provide 731 dwellings which will accommodate a population including people moving in from outside of the area. These migrants typically have a younger age profile and will thereby alleviate the ageing of the population that is anticipated. In so doing this will provide for a younger population which will support the local economy and is considered a **minor beneficial effect**.

Deprivation

5.5.6 The delivery of housing and services in the Proposed Development and in any combination of related developments is not considered to have a significant effect on the existing minimal levels of deprivation, nevertheless, might alleviate the poverty levels in the adjoining areas, which were ranked in 20-30% of the most deprived areas nationally. This development is considered to have a **minor beneficial effect** on deprivation levels in the area.

Housing

5.5.7 The housing within the Proposed Development and any combination of related developments will provide for the existing and newly arising need for affordable homes and homes in general. This will also contribute to alleviating house price rises and provides the opportunity to deliver housing that is appropriate to the specific needs of the area. The Proposed Development and any combination of related developments are strategic in scale and are therefore considered to provide a **moderate beneficial effect** to meet the strategic needs and to maintain a sufficient supply of housing.

Economy

5.5.8 The provision of employment, community, and retail facilities all provide new jobs to the town. Cumulative proposals include an erection of a food superstore of 2,365 sqm (25,457 sq ft) sales area. The development has been completed and is operational. For the purposes of this assessment, the number of jobs generated by the development is provided on the basis of the employment densities identified in the Employment Densities Guide[11].

5.5.9 It is expected that the proposed development of the retail facility of the above size should provide approximately 106 workplaces across the facility (and associated areas).

5.5.10 The Proposed Development and related developments will also provide for jobs during the construction phase. The average turnover of an individual construction worker across the South West region[12] can be applied to the construction costs as per paragraph

[10] 2011 Census data, Office for National Statistics.
[11] 2015, Employment Densities Guide, Homes and Communities Agency
[12] November 2017 Business Population Estimates 2018, Department for Business, Innovation and Skills

5.4.6. In the East this average turnover is £108,946 per worker which results in circa 800 person years of construction employment arising from residential element of the Proposed Development. Based on the rates identified previously, the delivery of dwellings could support in the region of 160 jobs per annum (assuming the related developments were all built within 5 years, as some of the developments were already completed). There could also be additional jobs supported to develop the non-residential elements of the schemes.

5.5.11 The Proposed Development and related developments totalling 731 dwellings would accommodate circa 701 households based on the occupancy levels identified in the 2011 Census. Once account is taken of those households who are likely to move within the area the developments are estimated to provide accommodation for circa 245 households that are new to the area (with the remainder moving from within the area). In 2011, the Census identified that there were an average of 1.09 employed persons per household nationally. If this rate is assumed to be maintained across the period of development then this would result in the developments providing around 269 additional workers, depending on the number of households that moved within the area. This is likely to exceed the number of jobs likely to be provided as a result of the developments and as a result the net commuting flows are likely to be reduced.

5.5.12 The additional 245 new households assumed to be accommodated within the related developments will provide for an additional disposable income. Assuming that the new market housing will align with the output area classification (of the ONS), approximately £7.3M[13] worth of household expenditure will arise from the site.

5.5.13 The additional jobs and expenditure as well as the potential decrease to commuting flows arising from the Proposed Development and related developments are considered to provide a **minor beneficial effect** on the local economy.

Educational Capacity

5.5.14 If all of the related developments were delivered this would provide an additional 616 homes, would generate an additional need for primary school places. The exact figure is unknown at this stage, nevertheless it can be expected that the number of primary school students will possibly exceed the existing capacity of 144 identified in the paragraph 5.3.6 of this chapter.

5.5.15 It is crucial to acknowledge that the proportion of the cumulative developments has already been completed and occupied. It is therefore expected that some of the students arising from the cumulative developments are already enrolled in the local school facilities.

5.5.16 At the same time, the analysis carried out in the paragraph 5.4.22 indicates a shortage of the secondary school spaces. Consequently, it is assumed that the development of a secondary school at Farm Lane/Kidnappers Lane will start to be delivered in 2021. The school will have six forms of entry providing for approximately 900 pupils and will ease the existing pressure on the secondary school provision across Cheltenham. The proposed secondary school is expected to be opened and Year 7 operational by September 2021. This is prior commencing the Oakley Farm development. At the same time, it is expected that the proposed developments falling into the cumulative section will be fully completed within next few years. Subject to the above, it is expected that there will be a sufficient capacity to accommodate secondary school population arising from the proposed development.

[13] Calculated from Table A51 of the Family Spending Survey 2018, ONS

5.5.17 As a result, there is considered to be a **neutral effect** on educational capacity through the development of six forms of entry secondary school in the area.

Healthcare Provision

5.5.18 If all of the related developments were built this would accommodate 1,593 people at the very most (although it is likely to be significantly less as people will move from within the existing population). Even this level of growth would generate a need for at most 0.97 GPs. However, given the existing surplus of 6.5 GPs this could be accommodated without extra provision.

5.5.19 The above analysis suggests there is a solid surplus capacity to accommodate the proposed developments and so it is considered to be a **neutral effect** on healthcare provision.

Community Facilities

5.5.20 The Proposed Development and related developments will accommodate an additional population of around 1,593 people. These people will provide an additional disposable income as well as a potential critical mass to support the viability of existing and potential future retail and leisure facilities.

5.5.21 The above proposals further contribute to the existing prosperity of the retail facilities in the area, including a 2,365 sqm foodstore, open space and associated facilities.

5.5.22 The Proposed Development will provide an extensive amount of Open Space and green space provision. The initial assessment indicates an overall provision of 8.8 ha of the green space.

5.5.23 The Proposed Development and related developments will provide additional natural and semi-natural greenspaces which will contribute towards the proposed standards for the town.

5.5.24 The provision of additional disposable income to support the viability of local services as well as open space facilities that either meet or contribute to the proposed standards for the town is considered a **minor beneficial effect**.

5.6 SUMMARY

Introduction

5.6.1 This chapter considers the potential socio-economic effects of the Proposed Development during both the construction and operational phases. The analysis focuses on the provision of social and economic effects of the Proposed Development.

5.6.2 There are a wide range of socio-economic issues that exist and which will be affected by the Proposed Development.

5.6.3 There is no specific guidance available which establishes a methodology for undertaking an EIA of the socio-economic effects of a proposed development. Accordingly, the approach adopted for this assessment is based on professional experience and best practice, and in consideration of the policy requirement/tests set out within the National Planning Policy Framework (NPPF), and the extant and emerging development plan.

5.6.4 It considers the future baseline position rather than the current baseline position. This ensures that the potential effects are considered relative to the position that is likely to arise should the Proposed Development not occur.

Baseline Conditions

5.6.5 The site is situated to the north east of Cheltenham town centre. The site is bounded to the south by Harp Hill Road and to the west by Wessex Drive both of which are established residential areas. The site is situated within the Battledown Ward.

5.6.6 Cheltenham is expected to experience population growth. It is expected to see a stronger growth in the ageing population than it is noted nationally, couple with a notable decrease in working age population.

5.6.7 The area that is subject to the outline planning application is currently a greenfield site. It is assumed that the proposed development will provide a housing to accommodate future population growth as well as stimulate local economic activity.

5.6.8 The Borough is planned to accommodate housing development during the plan period. The Proposed Development is expected to provide a part of this supply.

5.6.9 There is currently sufficient educational and medical capacity serve to the existing community. Upon delivering this development, it is likely that the area will be able to accommodate the population growth arising from the proposal. The analysis contained in this chapter indicates that there is a capacity across both primary and secondary schools in the statutory distance from the site and also a healthy capacity of GPs in a close vicinity.

Likely Significant Effects

5.6.10 The key socio-economic effects of the Proposed Development can be summarised as follows:

- Provision of 250 residential units, demolition of existing buildings, vehicular access from Harp Hill and open space and landscaping
- Provision of approximately 91 additional jobs, with additional 64 indirect jobs and 36 induced jobs during the construction phase in the construction sector;
- Accommodation for a population of circa 568 people, of which 199 are estimated to be new to the area;
- A positive effect on the age of the population;
- New houses and services within the area to address the existing deprivation;
- Provision of planned housing (including affordable housing) of a range of types, sizes and tenures to meet local and district-wide housing needs;
- A £7.8M of gross income, of which £2.7M is likely to be new to the area, which will support local services;
- An increase in the local economy;
- An overall provision of 8.8 ha of green space.

Mitigation and Enhancement

5.6.11 No mitigation has been identified in socio-economic terms given that the Proposed Development provides beneficial effects.

Conclusion

5.6.12 Overall the Proposed Development is considered to provide beneficial effects and will contribute to the housing and employment needs of the district.

5.6.13 **Table 5.7** provides a summary of effects, mitigation and residual effects.

Table 5.7: Summary of Effects, Mitigation and Residual Effects.

Receptor / Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation / Enhancement Measures	Residual Effects ****
Construction								
Housing	N/A	Permanent	N/A	N/A	District	Moderate Beneficial	N/A	N/A
Economy	N/A	Temporary	N/A	N/A	District/Local	Moderate Beneficial	N/A	N/A
Operation								
Population	N/A	Permanent	N/A	N/A	District/Local	Moderate Beneficial	N/A	N/A
Deprivation	N/A	Permanent	N/A	N/A	District/Local	Neutral	N/A	N/A
Housing	N/A	Permanent	N/A	N/A	District/Local	Moderate Beneficial	N/A	N/A
Educational Capacity	N/A	Permanent	N/A	N/A	District/Local	Neutral	N/A	N/A
Healthcare Provision	N/A	Permanent	N/A	N/A	District/Local	Neutral	N/A	N/A
Economy	N/A	Permanent	N/A	N/A	District/Local	Minor Beneficial	N/A	N/A
Community facilities	N/A	Permanent	N/A	N/A	District/Local	Minor Beneficial	N/A	N/A
Open Space	N/A	Permanent	N/A	N/A	District/Local	Neutral	N/A	N/A
Cumulative and In-combination								
Population	N/A	Permanent	N/A	N/A	District/Local	Minor Beneficial	N/A	N/A

Deprivation	N/A	Permanent	N/A	N/A	District/Local	Minor Beneficial	N/A	N/A
Housing	N/A	Permanent	N/A	N/A	District/Local	Moderate Beneficial	N/A	N/A
Educational Capacity	N/A	Permanent	N/A	N/A	District/Local	Minor Beneficial	N/A	N/A
Healthcare Provision	N/A	Permanent	N/A	N/A	District/Local	Neutral	N/A	N/A
Community Facilities	N/A	Permanent	N/A	N/A	District/Local	Neutral	N/A	N/A
Economy	N/A	Permanent	N/A	N/A	District/Local	Minor Beneficial	N/A	N/A

6 LANDSCAPE & VISUAL

6.1 INTRODUCTION

6.1.1 This chapter assesses the likely significant landscape and visual effects of the Proposed Development during construction and operation.

6.2 ASSESSMENT APPROACH

6.2.1 This assessment has been informed by desktop assessment to identify potentially sensitive landscape and visual receptors which was followed up by field survey undertaken by two Chartered Landscape Architects. A digital Zone of Theoretical Visibility (ZTV) was also produced to identify potential visual receptors over a 5km area. Finally, the requirements of the scoping opinion provided by Cheltenham Borough Council (CBC) have been considered.

LVIA Methodology

Assessment Guidelines

6.2.2 The methodology used to identify and assess the landscape and visual effects of proposed development and their significance is based on the following recognised guidance:

- Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition (Landscape Institute and Institute of Environmental Management and Assessment).
- Photography and Photomontage in Landscape and Visual Impact Assessment, Advice Note 01/11 (Landscape Institute)
- Visual Representation of Development Proposals Technical Guidance Note 06/19 (17th September 2019) – This guidance was introduced at the same time as this assessment was being drafted. Where possible this guidance has been adhered to with regard to presentation of viewpoint photographs. Type 1 visualisations have been incorporated into this assessment to represent viewpoints. No wire frame models have been produced due to the schematic nature of the outline proposals.

6.2.3 Landscape and visual impact assessment is a tool used to identify and assess the effects of change, resulting from development and its significance on the landscape as a resource and people's views and visual amenity. It is an iterative process intended to inform design decisions so that new development can avoid or reduce significant negative (adverse) effects on the landscape and visual environment.

6.2.4 It is recognised as important to draw distinctions between landscape and visual effects during the assessment; treating them independently although related. GLVIA sets out the recommended process for assessing the significance of effects by comparing the sensitivity of the visual or landscape receptor with the magnitude of change resulting from development.

6.2.5 The GLVIA states that the assessment should cover the following stages:

- Project description: description of the proposed development for the purpose of assessment; main features of proposals and establish parameters
- Baseline studies: establishes existing nature of landscape and visual environment in the study area, includes information of the value attached to different resources

- Identification and description of effects: that are likely to occur including whether they are adverse or beneficial
- Assess significance of effects: systematic assessment of the likely significance of the effects identified
- Mitigation: proposes measures designed to avoid/prevent, reduce or offset (or compensate for) any significant negative (adverse) effects

Method of Desk Study

6.2.6 Assessment of Ordnance Survey map data, aerial photographs, landscape designations and landscape planning policies are undertaken at the outset to inform the extent of the study area and identify sensitive visual receptors and likely sensitivity of the landscape. The opinion and requirements of the Local Planning Authority provided through the scoping opinion have also been included within the assessment.

Method of Field Work

6.2.7 Site survey is undertaken by two chartered landscape architects. Visual and landscape receptors are checked and refined initially from the study site. Visual receptors are then visited from the nearest publicly accessible location to select the most suitable and representative viewpoint. Assessment is undertaken on site; locations and notes recorded on maps and photographs taken from viewpoints. Photographs are taken using a digital SLR set to the equivalent of a 50mm SLR lens; which best represents the view experienced by the human eye.

6.2.8 With reference to Landscape Institute Technical Note 'Visual Representation of Development Proposals Technical Guidance Note 06/19 (17th September 2019)' photographs included to represent views are generally intended to conform to Type 1 Visualisations. This technical note was still being evaluated at the time that this assessment was being prepared.

Method for Assessing Landscape

Landscape Character and Characterisation

6.2.9 Landscape Character Assessment Guidance defines 'landscape' as consisting of the following elements:

- Natural: Geology, landform, air and climate, soils, flora and fauna
- Cultural/Social: land use, settlement, enclosure
- Perceptual and Aesthetic: memories, associations, preferences, touch and feel, smells, sounds and sight

6.2.10 Landscape Character Assessment Guidance encourages assessment at different scales that fit together as a hierarchy of landscape character areas and types so that each level can provide more detail to the one above. Identifying the existing landscape character is part of establishing the baseline conditions of a study site and its study area.

National Character Assessment

Establishes broad pattern of the landscape of the wider countryside

↓

District Character Assessment

Establishes pattern of the landscape of the district/county countryside

↓

Local Character Assessment

Establishes pattern of the landscape at a local level

↓

Site elements and features

Establishes to landscape resources on the site such as trees, hedges etc.

Value of the landscape receptor

6.2.11 Value can apply to areas of landscape as a whole, or to the individual elements, features and aesthetic or perceptual dimensions which contribute to the character of the landscape. Value is determined by some or all the following aspects:

- Importance applied to landscape by designation or planning policy and the level of this importance in terms of local, regional or national importance
- The views of the local consultees including the local planning authority, members of the public, special interest groups such as Parish Council, wildlife or walking groups
- The rarity, importance and condition of the landscape resource as judged objectively by the landscape professional

6.2.12 International and Nationally designated landscapes tend to be of the highest value, locally designated landscapes are most likely to be of moderate value and undesignated landscapes can either be of lower to moderate value depending on an assessment taking into account the following factors:

- Condition of the local landscape
- Scenic quality
- Rarity
- Representativeness
- Conservation interests
- Recreation value
- Perceptual aspects
- Associations

6.2.13 The definitions of value used are as follows:

- **National:** such as World Heritage Sites **(Very High)**
- **Regional:** such as National Parks, AONB, Conservation Areas, Listed Buildings **(High)**
- **Sub-Regional:** such as Special Landscape Areas, Areas of Great Landscape Value, several protected features such as Tree Preservation Orders, site may be mentioned in literature, art, tourism or in district/county landscape character assessments or sensitivity assessments. **(Medium High)**
- **District:** generally undesignated, may have value at a community level by tourism, literature, art, village greens or allotments, may have a small number of protected features **(Medium)**
- **Local:** no designated features or landscape, limited value, no protected features **(Low)**

Susceptibility of the landscape receptor to the proposed change

6.2.14 This relates to the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular landscape type or area, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate

the proposed development without undue consequences for the maintenance of the baseline situation and/or the achievement of the of landscape planning policies.

6.2.15 The definitions of susceptibility of the proposed change to landscape used are as follows:

- **High:** Elements, features or whole landscapes that are susceptible to change, with limited opportunities to accommodate change based on the strength of the existing landform, pattern, land cover, settlement pattern, sense of enclosure, visual context, tranquillity.
- **Medium:** Elements, features or whole landscapes that are partially susceptible to change, with some opportunities to accommodate change based on the strength of the existing landform, pattern, land cover, settlement pattern, sense of enclosure, visual context, tranquillity.
- **Low:** Elements, features or whole landscapes that have limited susceptibility to change, with opportunities to accommodate change based on the strength of the existing landform, land use pattern, land cover, settlement pattern, sense of enclosure, visual context, tranquillity.

Definition of Landscape Sensitivity

6.2.16 Landscape **sensitivity** is determined by combining judgements of the **susceptibility** to the proposed change and the **value** of the receptor. Refer to **Table 6.1**.

Table 6.1: Definition of Landscape Sensitivity:

Sensitivity	Definition
High	- High susceptibility to proposed change - May be a designated landscape valued at a regional or national level - Landscape characteristics are vulnerable and unable to accommodate change - Development may result in significant changes to landscape character
Medium-High	- Medium or high susceptibility to proposed change - May be a designated landscape valued at a sub-regional or regional level - Landscape characteristics are vulnerable with limited ability to accommodate change - Development may result in moderate changes to landscape character
Medium	- Medium susceptibility to proposed change - Some designated features and/or valued at a sub-regional level - Landscape characteristics are able to accommodate some change - Development may not result in significant changes to landscape character
Medium-Low	- Low or medium susceptibility to proposed change - Likely to be an undesignated landscape but possibly some designated features and/or valued at a sub-regional level

	- Landscape characteristics are resilient to accommodating change - Development may not result in significant changes to landscape character
Low	- Low susceptibility to proposed change - Undesignated landscape and/or valued at a district level - Landscape characteristics are robust and able to accommodate change - Development may not result in significant changes to landscape character
Negligible	- No susceptibility to proposed change - Undesignated, valued at a local level - Landscape characteristics that are degraded or discordant with landscape character - Development may result in an improvement to landscape character

Landscape Receptor – Overall Magnitude of Effect

6.2.17 The magnitude of the effect is determined by combining the professional judgements about the size or scale of the landscape effect, the geographical extent over the area which the effect occurs, its reversibility and its duration. **Refer to Table 6.2**:

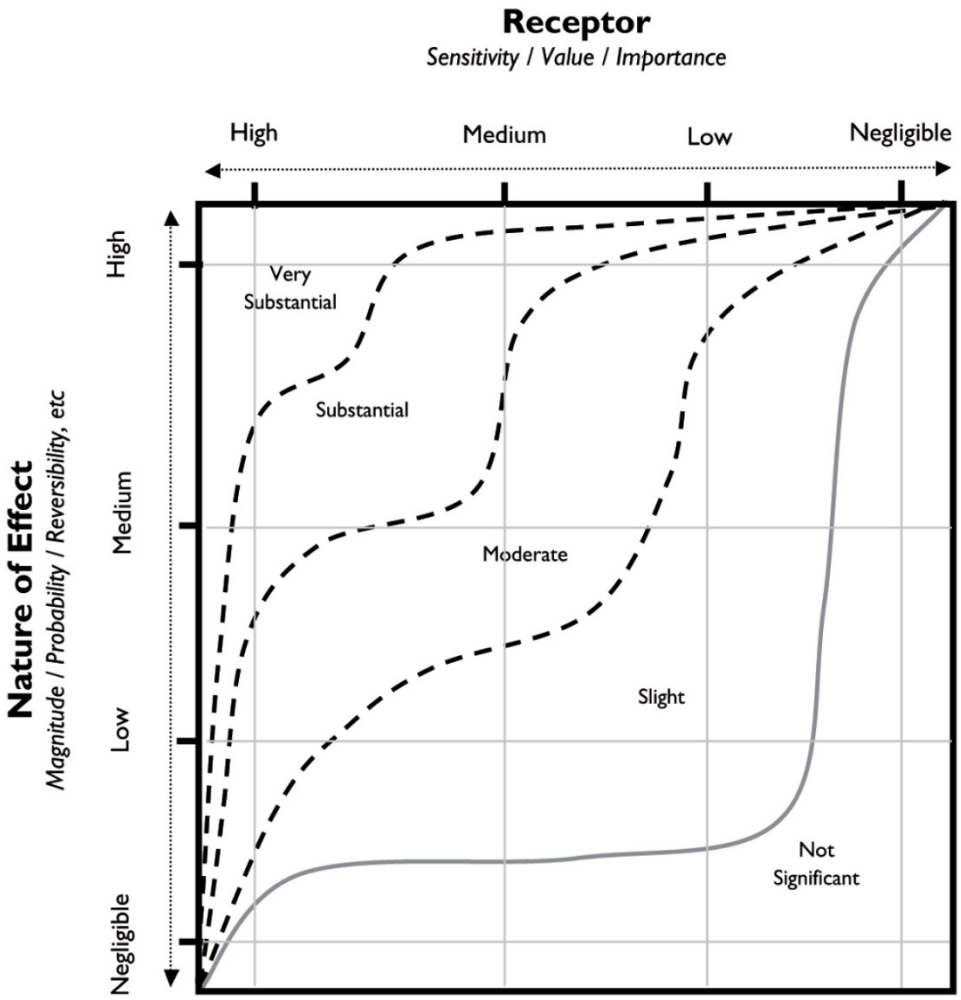
- The scale of the effect – for example, whether there is complete loss of a particular element/feature/characteristic or partial loss or no loss; proportion of key elements or features of the baseline that will be lost, the value/importance of these elements to the landscape character and the degree of contrast between the development and the landscape character.
- The geographical extent of the area affected relative to the receptor; this will range from the site itself, a short distance comprising the immediate local area, a medium distance comprising the local and middle landscape and long distance comprising the wider landscape.
- The duration of the effect; 0-1 year for the construction period is considered short term duration, 1-10 years for mitigation to establish is considered medium term duration, 10 years and beyond is considered long term duration.
- Reversibility; the extent to which the development could be removed and the land reinstated. Reversible and temporary development would include solar farms and wind turbines. Other development such as housing would be considered irreversible and permanent.

Table 6.2: Definition of Landscape Magnitude of Effect:	
Magnitude of change:	Predicted landscape effects:
High	- Very substantial loss of landscape elements of the landscape, and/or the lost elements make a substantial contribution to

		landscape character, and/or change affects a large geographical area, and/or the development introduces a dominating and contrasting characteristic to the landscape
Medium-High	-	Substantial loss of landscape elements of the landscape, and/or the lost elements make a large contribution to landscape character, and/or change affects a moderate to large geographical area, and/or the development introduces a prominent and partially uncharacteristic feature to the landscape
Medium	-	Moderate loss of landscape elements of the landscape, and/or the lost elements make a moderate contribution to landscape character, and/or change affects a moderate geographical area, and/or the development becomes an identifiable feature but not wholly uncharacteristic to the landscape
Medium-Low	-	Partial loss of landscape elements of the landscape, and/or the lost elements make a moderate to small contribution to landscape character, and/or change affects a small to moderate geographical area, and/or the development is perceptible but not wholly uncharacteristic to the landscape
Low	-	Minor loss of landscape elements of the landscape, and/or the lost elements make a small contribution to landscape character, and/or change affects a small geographical area, and/or the development introduces elements not uncharacteristic to the landscape
Negligible	-	Negligible or no loss of landscape elements of the landscape, and/or the lost elements make a limited contribution to landscape character, and/or change affects a very small geographical area, and/or the development introduces characteristics that are consistent with or enhance the landscape, and/or effects may be short term, temporary or reversible

Assessment criteria used to assess landscape effects

6.2.18 Landscape effects are judged by assessing the overall sensitivity (susceptibility to change and value of receptor) of the existing landscape and the overall magnitude of effect predicted as a result of the development (size/scale, geographical extent, duration and reversibility of effect). The diagram below, produced by IEMA for Environmental Impact Assessment, is utilised to judge the effect.



Method for Assessing Views

6.2.19 A Zone of Theoretical Visibility (ZTV) is often produced as an initial desktop tool to inform the extent of the study area based on the theoretical visibility of the development. The (ZTV) illustrates the extent to which the proposed development site as a whole is potentially visible from the surrounding area. ZTV's are prepared using GIS software (Global Mapper) by carrying out an analysis of the visibility of the site from the surrounding area up to 5km using a digital terrain model from OS Landform DTM profile and OS Panorama DTM data. Calculations are based on bare earth survey OS height data with a viewer height set at 1.7m. The digital terrain model and subsequent output are based on bare earth modelling and as such do not take into account any screening from land cover such as buildings, hedgerows and trees. ZTV mapping therefore represents a 'worst case' scenario assuming 100% visibility, where the actual extents of visibility are likely to be less extensive. ZTV's are used to determine where there may be potential views of the development which are then further verified with site visits. The ZTV is then used to identify potential key views of the development which are then verified by field work to further identify and visit visual receptors. Where a ZTV is not produced, the study area is determined by reviewing land use and landform shown on OS maps and aerial photos. Field work is then undertaken to refine the extent of views.

6.2.20 Viewpoints selected for inclusion in the assessment and for illustration of the visual effects fall broadly into three groups:

- **Representative viewpoints,** selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ – for example, certain points may be chosen to represent the views of particular public footpaths and bridleways.
- **Specific viewpoints,** chosen because they are key and sometimes promoted viewpoints within the landscape, including for example specific local visitor attractions, viewpoints in areas of particularly noteworthy visual and/or recreational amenity such as landscapes with statutory landscape designations, or viewpoints with particular cultural landscape associations.
- **Illustrative viewpoints,** chosen specifically to demonstrate a particular effect or specific issues, which might, for example, be restricted visibility at certain locations.

6.2.21 Visual effects are determined through a process of identifying which visual receptors are likely to experience significant visual effects. The process of identifying effects involves determining the **sensitivity** of each visual receptor and **magnitude of change** experienced at each which leads to a professional judgement of the **visual effects**.

Value attached to views

6.2.22 Visual sensitivity is partially determined by judgements made attributing value to views. Judgements take account of:

- Recognition of the value attached to particular views, for example in relation to heritage assets, or through planning designations
- Indicators of the value attached to views by visitors, for example through appearances in guidebooks or on tourist maps, provision of facilities for their enjoyment (such as parking places, sign boards and interpretive material) and reference to them in literature or art

6.2.23 The value of views is defined as follows:

- **Regional;** Recognition of the view by its relation to a heritage asset or national planning designation (AONB, National Park, National Trail). Appearance in guide books, tourist maps or featured in well-known art works. Provision of facilities such as interpretation panels, parking places & signage. Views enjoyed at a local or national level. **(High Value)**
- **District;** Local planning designation (Country Park, AGLV) or valued locally by village design statement or sensitivity assessment. May be some detractor elements, views enjoyed at a local level. **(Medium Value)**
- **Local;** No specific value placed by designation or publication, may be a large proportion of detractor elements within the view, views enjoyed at a community or site level. **(Low Value)**

Susceptibility of visual receptors to change

6.2.24 Visual sensitivity is partly determined by the susceptibility to change of each visual receptor. The susceptibility of different visual receptors to changes in views and visual amenity is mainly a function of:

- The occupation or activity of people experiencing the view at particular locations; and
- The extent to which their attention is focussed on the views and visual amenity they experience at particular locations.

6.2.25 The susceptibility of visual receptors to change in views and visual amenity is defined broadly as follows:

- **High**; residents at home (generally rooms occupied during daylight hours), people engaged in outdoor recreation (public rights of way or where attention is focussed on the landscape or particular views), visitors to heritage assets or other attractions where the surroundings are important to the experience, communities where views contribute to the landscape setting enjoyed by residents in the area.
- **Medium**; travellers on road, rail or other transport modes such as cyclists.
- **Low**; people engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views, people at their place of work whose attention may be focused on their work or activity.

6.2.26 Combining judgements regarding the susceptibility of change with the value attached to views leads to a professional judgement of sensitivity of each visual receptor.

Table 6.3: Definition of Visual Sensitivity	
Sensitivity rating:	Definition:
High	Receptor may have high susceptibility to changes in view/visual amenity, views experienced may be of a regional value designated landscape or at a defined publicised viewing point/attraction, receptors may include residents at home (from rooms generally occupied in daylight hours), users of national or long distance trails or visitors to listed parks/gardens.
Medium-High	Receptor may have medium or high susceptibility to changes in view, views experienced may be of a regional or district value designated landscape, receptors may include travellers on scenic road routes, residents at home (from rooms not facing the development or generally not occupied in daylight hours), users of public rights of way.
Medium	Receptors may have medium susceptibility to changes in view/visual amenity, views experienced may be within district value locally designated landscape, receptors may include travellers on roads, pedestrians or cyclists.
Medium-Low	Receptors may have with low or medium susceptibility to changes in view/visual amenity, views experienced may be of a district or local value locally designated landscape where there maybe be some detractors, receptors may include commuters on busy roads such as motorways or urban roads, users may be involved in passive outdoor sport such as golf.
Low	Receptors may have low susceptibility to change in views/visual amenity, views experienced are likely to be of local value undesignated landscape with several detractors, receptors may include people at work, people engaged in outdoor sport or recreation which does not depend on landscape as a setting

Negligible	Receptors may have low or negligible susceptibility to change in views/visual amenity, views experienced are likely to be of local value undesignated landscape dominated by detractors where there are low numbers of receptors engaged in indoor active work

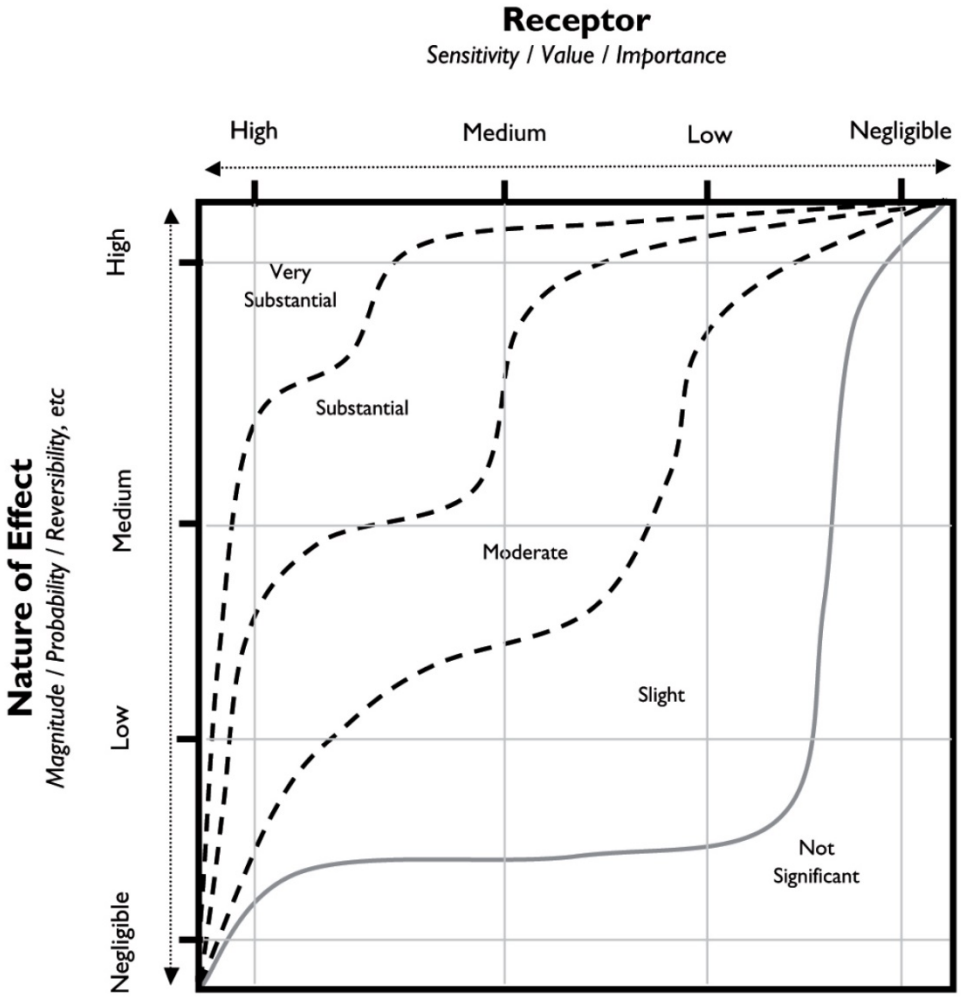
Visual Receptor – Overall Magnitude of Effect

6.2.27 The magnitude of the effect is determined by combining the professional judgements about the size or scale of the visual effect, the geographical extent over the area which the effect occurs, its reversibility and its duration. Refer to table 3.4:

Table 6.4: Definition of Visual Magnitude of Effect	
Magnitude of change:	Predicted visual effects:
High	Total loss or very substantial alteration of key views, and/or site may form a very large proportion of the view, and/or all of the site may be visible, and/or views of the site may be experienced over a long distance by high numbers of receptors, and/or views may be permanent and irreversible
Medium-High	Substantial alteration of key views, and/or site may form a medium to large proportion of the view, and/or most of the site may be visible, and/or views of the site may be experienced over a moderate to long distance by moderate to high numbers of receptors, and/or views may be permanent and irreversible
Medium	Moderate alteration of key views, and/or site may form moderate proportion of the view, and/or around half of the site may be visible, and/or views of the site may be experienced over a moderate distance by moderate numbers of receptors, and/or views may be permanent and irreversible
Medium-Low	Moderate to minor alteration of key views, and/or site may form moderate to minor proportion of the view, and/or partial views of the site, and/or views of the site may be experienced over a moderate to short distance by moderate to low numbers of receptors, and/or views may be permanent and irreversible
Low	Minor alteration of key views, and/or site may form small proportion of the view, and/or partial or obscured views of the site, and/or views of the site may be experienced over a short/local distance by low numbers of receptors, and/or views may be permanent and irreversible
Negligible	Limited alteration of key views, and/or site may form very small proportion of the view, and/or limited views of the site, and/or views of the site may be experienced over a very short distance by a limited number of receptors, and/or views may be temporary, reversible, permanent or irreversible

Assessment criteria used to assess visual effects

6.2.28 Visual effects are judged by assessing the overall sensitivity (susceptibility to change and value of receptor) of the existing landscape and the overall magnitude of effect predicted as a result of the development (size/scale, geographical extent, duration and reversibility of effect). The diagram below, produced by IEMA for Environmental Impact Assessment, is utilised to judge the effect.



Assessment criteria used to assess significance of effects

6.2.29 Following identification of the sensitivity, extent and significance of the individual landscape and visual effects the overall effects are combined with each other. A judgement is then made by identifying the most significant effects, after mitigation, resulting in the likely impacts of the proposed development. The definitions of the final statement of significance are shown in **Table 6.5**.

Table 6.5: Definition of significance	
Significance of impact:	Definition of predicted effects:

Major beneficial (positive) effect	The proposals would result in: the scheme causing a significant improvement to the existing view successful mitigation providing significant improvements to landscape quality and character fitting in very well with the scale, landform and pattern of the existing landscape
Moderate beneficial (positive) effect	The proposals would result in: the scheme causing a noticeable improvement to the existing view successful mitigation providing noticeable improvements to landscape quality and character fitting in well with the scale, landform and pattern of the existing landscape
Minor beneficial (positive) effect	The proposals would result in: the scheme causing perceptible improvement in the existing view successful mitigation providing slight improvements to landscape quality and character fitting in with the scale, landform and pattern of the existing landscape
Negligible	The proposals would result in: the scheme causing no discernible deterioration or improvement to the existing view mitigation that neither deteriorates or improves landscape the scale, landform and pattern of the current landscape is broadly retained
Minor adverse (negative) effect	The proposals would result in: the scheme causing a slight perceptible deterioration to the existing view almost wholly success in mitigating adverse effects not quite fitting the landform and scale of the landscape
Moderate adverse (negative) effect	The proposals would result in: the scheme causing a noticeable deterioration to the existing view only partial mitigation of adverse effects variance to the existing landscape, out of scale or at odds with the local pattern and landform
Major adverse (negative) effect	The proposals would result in: the scheme being immediately apparent causing significant deterioration to the existing view no way of fully mitigating adverse effects considerable variance to the existing landscape, degrading the integrity of its overall character

National Planning Policy

6.2.30 The application site is located within the Cotswold Area of Outstanding Natural Beauty (AONB). The application site is outside of the Gloucester and Cheltenham Green Belt.

6.2.31 Paragraph 170 of the NPPF states that planning policies and decisions should contribute to and enhance the natural and local environment by:

- Protecting and enhancing valued landscapes, sites of biodiversity or geographical value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
- Recognising the intrinsic character and beauty of the countryside, and the wider benefits of the best and most versatile agricultural land, and of trees and woodland.

6.2.32 Paragraph 172 emphasises that great weight should be given to conserving and enhancing landscape and scenic beauty in National parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues.

Cotswold AONB Management Plan 2018-2023

6.2.33 The Cotswolds Conservation Board has two statutory Purposes:

- To conserve and enhance the natural beauty of the AONB; and
- To increase the understanding and enjoyment of the special qualities of the AONB.

6.2.34 The Cotswold AONB Board have produced several documents to inform the management of AONB land and to guide development. These documents include:

- AONB Landscape Character Assessment;
- AONB Landscape Strategy and Guidelines; and
- AONB Management Plan 2018-2023.

6.2.35 The following policy provides guidance and criteria for development within the Cotswolds AONB:

6.2.36 **Policy CE1-Landscape**: This policy states that proposals that are likely to impact on the landscape of the AONB:

- Should have regard to, be compatible with and reinforce the landscape character of the location as described in the Boards Landscape Character Assessment and Landscape Strategies and Guidelines.
- Should have regard to the scenic quality of the location and its setting and ensure that views into and out of the AONB are conserved and enhanced.

6.2.37 **Policy CE3-Local Distinctiveness**: This policy states that proposals that are likely to impact on the distinctiveness of the AONB:

- Should be compatible with the Boards Landscape Character Assessment, Landscape Strategies and Guidelines and Local Distinctiveness and Landscape Change.
- Be designed and landscaped to respect local settlement patterns, building styles and materials.
- Use an appropriate colour of limestone to reflect local distinctiveness.
- The policy also states that innovative designs informed by local distinctiveness, character and scale should be welcomed.

AONB Landscape Strategy and Guidelines

6.2.38 The study site is located within sub landscape character area 2D 'Coopers Hill to Winchcombe' of the Escarpment Landscape Character Type as published in the Cotswolds AONB Landscape Character Assessment. Relevant landscape Strategies and guidelines published for the 'Escarpment' landscape character type have been referred to in this assessment and are set out in outline below.

6.2.39 The AONB landscape strategy and guidelines identifies new development as a local force for change and outlines strategies and guidelines to address these including recommendations for ensuring new development does not interrupt the setting of settlements or views across the vale. Strategies and guidelines include the following:

- Maintain the open, sparsely settled character limiting new development to existing settlements.
- Ensure new development is proportionate and does not overwhelm the existing settlement.
- Ensure that new development does not adversely affect settlement character and form.
- Layout of development should respect local built character and avoid cramming up to boundaries resulting in hard suburban style edge to the settlement.
- Control the proliferation of suburban building styles and materials
- Ensure new built development is visually integrated with the rural landscape setting and does not interrupt the setting of existing villages or views.
- Promote the use of local stone and building styles in the construction of new buildings and extensions to existing dwellings.
- Retain existing trees, dry stone walls, hedges etc as part of the scheme.
- Ensure new development is integrated into its surroundings and does not interrupt the setting of existing settlements. Break up harsh edges of new development with appropriate and adequate tree planting ideally in advance of the development taking place.
- Consider the impact on local Public Rights of Way as settlements expand and take into account any required improvements.

Local Landscape Planning Policy

6.2.40 Landscape policies and guidance forming part of the Gloucester, Cheltenham and Tewkesbury Joint Core Strategy (2011-2031) are relevant. Refer to **Appendix 6.1 Figure 6.1** for landscape designations and planning context.

6.2.41 Policies with relevance to landscape and visual matters are set out in outline below.

Policy SD7: The Cotswold Area of Outstanding Natural Beauty:

6.2.42 All development proposals within the setting of the Cotswolds AONB will be required to conserve and, where appropriate, enhance its landscape, scenic beauty, wildlife, cultural heritage and other special qualities. Proposals will be required to be consistent with the policies set out in the Cotswolds AONB Management Plan.

Policy SD3: Sustainable Design and Construction:

6.2.43 Proposals will demonstrate how they contribute to the aims of sustainability. All development will be expected to be adaptable to climate change in respect of the design,

layout, siting, orientation and function of both buildings and associated external spaces.Policy SD4: Design Requirements:

6.2.44 Proposals should consider context, character, sense of place; legibility and identity; public realm and landscape.

> **"Applications for major developments may be required to be accompanied by a Landscape and Visual Impact Assessment. Where visual impacts are predicted, new landscape planting which is appropriate to the character and setting of the site should be incorporated to reduce the impacts and enhance the existing landscape."**

Policy SD6: Landscape:

6.2.45 Landscape character is to be protected and proposals should ensure they have regard for local distinctiveness and historic character, protecting and enhancing the landscape character.

Policy SD8: Historic Environment:

6.2.46 Development should make a positive contribution to local character and distinctiveness, having regard to valued and distinctive elements of the historic environment.

Policy SD9: Biodiversity and Geodiversity:

6.2.47 Habitat features should be incorporated into the design, creating and enhancing wildlife corridors and ecological stepping stones between sites.

Policy INF3: Green Infrastructure:

6.2.48 Development proposals should consider and contribute positively towards green infrastructure. Where assets are created, retained or replaced within a scheme, they should be properly integrated into the design and contribute to local character and distinctiveness.

Landscape Policy Summary

6.2.49 A summary of designations which may influence the sensitivity of the study site is set out below:

Greenbelt	No
AONB	Yes
Listed Buildings on site	No
Listed buildings in close proximity	Yes. No.1 & No.2 Reservoirs, gate piers, boundary walls and pavilion, Harp Hill. All listed as Grade II.
Registered Park & Garden	No
Conservation Area	No
Tree Preservation Order	Yes: Oakley Farm TPO764 & Oakley Farm 2 TPO 765

Open Access/Public Rights of Way	PRoW (footpath) runs along the western boundary of the study site between Harp Hill and leading to Priors Road.
For landscape designations please refer to Figure 6.1	

6.2.50 There are a number of important designations which may influence development of the study site. The Cotswolds AONB designation seeks to protect the landscape and scenic value and although it is not a constraint to all development, development should provide an opportunity to provide local enhancement. This may include restoration of the landscape to better reflect natural habitats and traditional escarpment management and new public access to enjoy presently inaccessible views. The latter has potential to reduce pressure of visitors on other local visitor designations accessible from Harp Hill.

6.2.51 The Grade II reservoir structures are also a potential constraint. Although the reservoir land is incidental to the setting of the reservoir, the openness of the land forming part of the south eastern corner of the site allows clear views and interpretation of the pavilion and the reservoir from Harp Hill. These views are likely to be considered sensitive and important for appreciation of the structures which are otherwise generally hidden from view from all other areas.

6.2.52 In summary, Compliance with existing national and local policy will require development of the study site to achieve the following landscape and visual objectives:

- Conserve the landscape and scenic beauty of the Cotswolds AONB by considering the character of the landscape and conserving views afforded across the site.
- Contribute positively to the local character and distinctiveness protecting and enhancing landscape character
- Protect and conserve habitat features within the design contributing positively to green infrastructure
- Contribute positively to sustainability within the design.
- Protect views of the reservoir structures from Harp Hill.

6.2.53 Natural features such as trees and hedges along with its rural character are subject to local policy which generally seek to protect them and the rural character of the landscape. These are broad policies and not specific to the Application Site.

6.2.54 Strategies and guidelines which accompany the 'Escarpment' Landscape Character Type do not prevent development but identify constraints which if observed are intended to conserve landscape character and scenic beauty.

6.3 BASELINE CONDITIONS

Landscape Character (National Level)

6.3.1 The Application Site (or "study site") is located within the NCA 106 Severn and Avon Vales area (106), as shown on the Natural England National Character Area Map. The key characteristics of this character area are as follows:

- A diverse range of flat and gently undulating landscapes strongly influenced and united by the Severn and Avon rivers which meet at Tewkesbury.
- Prominent oolitic limestone outliers of the Cotswold Hills break up the low-lying landscape in the south-east of the area at Bredon Hill, Robinswood Hill, Churchdown Hill and Dumbleton Hill.

- West of the Severn the Mercia Mudstones predominate, producing poorer silty clay soils. Lias clays in the Avon Valley and east of the Severn create heavy but productive soils. River terrace gravels flank the edges of watercourses.
- Woodland is sparsely distributed across this landscape but a well wooded impression is provided by frequent hedgerow trees, parkland and surviving traditional orchards. Remnants of formerly extensive Chases and Royal Forests, centred around Malvern, Feckenham and Ombersley still survive.
- Small pasture fields and commons are prevalent in the west with a regular pattern of parliamentary enclosure in the east. Fields on the floodplains are divided by ditches (called rhines south of Gloucester) fringed by willow pollards and alders.
- Pasture and stock rearing predominate on the floodplain and on steeper slopes, with a mixture of livestock rearing, arable, market gardening and hop growing elsewhere.
- Unimproved neutral grassland (lowland meadow priority habitat) survives around Feckenham Forest and Malvern Chase. Along the main rivers, floodplain grazing marsh is prevalent. Fragments of unimproved calcareous grassland and acidic grasslands are also found.
- The River Severn flows broadly and deeply between fairly high banks, north to south, while the Warwickshire River Avon meanders over a wide flood plain between Stratford, Evesham and Tewkesbury. The main rivers regularly flood at times of peak rainfall.
- A strong historic time line is visible in the landscape, from the Roman influences centred at Gloucester, earthwork remains of medieval settlements and associated field systems through to the strong Shakespearian heritage at Stratford-upon-Avon.
- Highly varied use of traditional buildings materials, with black and white timber frame are intermixed with deep-red brick buildings, grey Lias and also Cotswolds stone.
- Many ancient market towns and large villages are located along the rivers, their cathedrals and churches standing as prominent features in the relatively flat landscape.

(Source: National Character Area Profile, Natural England)

6.3.2 At national level the Severn and Avon Vales landscape character area has some value to tourism but is by and large a settled and active landscape without notably high value attributed to either landscape or scenic beauty. The rivers and their flood plains within the vale are less settled and are of greater value for their rural character and ecological value than the working landscape on higher ground. Overall it may be considered a Local value landscape at national level.

6.3.3 The following statements of environmental opportunity provide guidance on where action can be targeted to conserve and improve the natural environment of the Severn and Avon Vales National Character Area:

- SEO 1: Protect and manage the landscape, heritage and biodiversity associated with the Severn Estuary, the river valleys and other hydrological features.
- SEO 2: Seek to safeguard and enhance this area's distinctive patterns of field boundaries, ancient hedgerows, settlements, orchards, parkland, small woodlands, chases, commons and floodplain management with their strong links to past land use and settlement history, and for the benefits this will bring to soil erosion, soil quality and biodiversity.

- SEO 3: Reinforce the existing landscape structure as part of any identified growth of urban areas, hard infrastructure and other settlements ensuring quality green infrastructure is incorporated enhancing health, access, recreation, landscape, biodiversity and geodiversity.
- SEO 4: Protect geological exposures and maintain, restore and expand semi-natural habitats throughout the agricultural landscape, linking them together to create a coherent and resilient habitat network enabling ecosystems to adapt to climate change.

Landscape Character (District/County Level)

6.3.4 At District/County level the Application Site is located within the Cotswold AONB Landscape Character Assessment Landscape Character Type: Escarpment (2) and the County Landscape Character Area: Coopers Hill to Winchcombe (2D). The key characteristics of this character type are as follows:

- Generally poor soils and steep sloping relief of the escarpment not suited to arable farming, and primarily used for pasture or woodland.
- Distinct sense of elevation with dramatic panoramic views.
- Gentler landform.

(Source: Cotswold AONB Landscape Character Assessment, LDA 2003)

6.3.5 The key characteristics of this character area (2D: Coopers Hill to Winchcombe) are as follows:

- This stretch of the escarpment forms a dramatic backdrop to the towns of Gloucester, Cheltenham and Bishop's Cleeve and limits their eastward expansion.
- The height of the escarpment gradually increases in a northerly direction.
- Woodland cover is less extensive than in the neighbouring Winchcombe to Broadway character area and is limited to narrow bands of broadleaved woodland at the scarp summit.
- There are fewer ancient woodlands.
- Land use is characterised by large unenclosed areas of rough grassland on upper slopes and improved pasture in moderately sized hedged enclosures bordering the vale.
- As elsewhere on the escarpment, numerous important archaeological sites border the upper slopes, the most notable being those on Crickley Hill, Cleeve Common and Nottingham Hill.
- Despite the close proximity of large urban centres, settlement on the escarpment slopes is sparse and limited to scattered linear settlements bordering the many roads that link Cheltenham to villages on the High Wold, and Oxford further to the east.

6.3.6 At District/County level the Escarpment landscape character type holds value for both landscape or scenic beauty due to its situation within the Cotswold AONB. The character types elevated position causes it to contribute to the setting of the Severn established settlements due to this overall the landscape is considered to be of Regional value.

6.3.7 Published strategies and guidelines for the Escarpment Character Type relevant to the Application Site include:

- Local Forces for Change - Development, expansion and infilling of settlements including residential, industrial and leisure onto or towards the lower slopes of the Escarpment, including Cheltenham:
- Maintain to open, dramatic and sparsely settled character of the Escarpment.

- Avoid development that will intrude negatively into the landscape and cannot be successfully mitigated, for example, extensions to settlements onto the escarpment.
- Conserve pattern of settlements fringing the lower slopes and their existing relationship to landform.
- Ensure new development is proportionate and does not overwhelm the existing settlement.
- Ensure that new development does not adversely affect settlement character and form.
- Conserve the distinctive orientation of linear villages on lower escarpment slopes and the relationship of settlements to the Escarpment and spring line.
- Avoid developments incorporating standardised development layout, suburban style lighting, construction details and materials that cumulatively can lead to the erosion of peaceful rural landscape character.
- Avoid cramming development right up to the boundaries resulting in hard suburban style edge to the settlement.
- Control the proliferation of suburban building styles and materials.
- Restore existing stone, old brick and half-timbered buildings within settlements in preference to new built development.
- Promote the use of local stone and building styles in the construction of new buildings and extensions to existing dwellings. (New buildings should, at least, respect local vernacular style).
- Existing buildings should be carefully conserved and where converted to new uses buildings must retain their historic integrity and functional character. Sound conservation advice and principles must be sought and implemented.
- Adopt measures to minimise and where possible reduce light pollution.
- Promote initiatives that remove heritage assets from 'at risk' status in the Heritage at Risk Register.
- Avoid development that may restrict or obscure views to the upper escarpment slopes and distinctive features such as folly towers and hillforts.
- Conserve the rural character of the road network, and in particular hollow-ways climbing the escarpment.
- Avoid proposals that result in the loss of archaeological and historical features or that impact on the relationship of the settlement and its links with surviving historical features.
- Ensure the historic character and context are included in Neighbourhood Plans.
- Identify key viewpoints to and from the escarpment.
- Create new woodlands that link to existing woodlands on lower escarpment slopes to counteract the impact of intrusive or degraded urban edges.
- Plant trees and hedges within and around new development to reduce impact on the landscape ideally in advance of the development taking place.
- Retain existing trees, hedges etc as part of the scheme.
- Promote and link to the escarpment 'green' infrastructure in any major extensions to Gloucester and Cheltenham.
- Ensure development proposals safeguard and provide new links and enhancements to the Public Rights of Way network.
- Consider the impact on local Public Rights of Way as settlements expand and take into account any required improvements.

6.3.8 The study site forms a small portion of this landscape character area and one that is largely set within an urban context with built form surrounding including the reservoirs which separate the study area from the wider countryside. With this urban context the character areas susceptibility to the proposed to change is deemed to be **medium** in this location.

6.3.9 The study site falls within LCT 2D: Coopers Hill to Winchcombe landscape character area. This is confirmed as being **Regional value (High)** due to AONB designation and **Medium susceptibility to change** resulting in an overall **Medium High sensitivity.**

Landscape Character (Local Level)

6.3.10 Please refer to **Appendix 6.1 Figure 6.2** for land use and land cover

Site Sensitivity

6.3.11 The 'Cheltenham Borough Council Landscape Character and Sensitivity Assessment of Cotswolds AONB' (May 2016) is intended to be read in association with the emerging Cheltenham Plan. This document identifies the site as falling within area '7.1 Oakley Farm Pasture Slopes' Landscape Character Area as shown in Appendix 1 Plan – Assessment Landscape Character Types and Areas. This character area is described in the assessment as can be seen below:

> **"Sloping topography with small to medium scale landscape. Pastoral farmland including mature hedgerow boundaries. Residential built development to the north, west and south. Wide, expansive open views to the north, medium to high tranquillity given the influence of adjacent landscape character. Medium quality elements including hedgerow and post and rail boundaries. Generally high-quality pasture with mature parkland setting trees and well-maintained hedgerow boundaries. Open to small medium scale landscape."**

6.3.12 This assessment confirms that the study site falls within the area 7.1 Oakley Farm Pasture Slopes landscape character area. This is confirmed as being **Regional value (High)** due to AONB designation and **High susceptibility to change.** It is notable that all of the land parcels types and areas assessed in the Cheltenham Borough Council Landscape Character and Sensitivity Assessment of Cotswolds AONB, are assessed to have Major landscape constraints and Low capacity for built development. This suggests that the sensitivity assessment may have taken a broader assessment approach as each of the 42 land parcels has differing attributes and context. As such the sensitivity assessment appears less helpful in identifying sensitivity changes within a land parcel, applying a broad brush outcome which represents the parcels highest sensitivity areas.

6.3.13 It is also notable that the Cheltenham Borough Council Landscape Character and Sensitivity Assessment of Cotswolds AONB includes the assessment for the study site within the 'Pasture Slopes' land parcel types and areas rather than the 'Escarpment' land parcels. This suggest that the study site has general attributes which are more representative of the sloping pasture characteristics than of the escarpment characteristics which is an important consideration taken into account when considering the strategies and guidelines for the escarpment landscape character type.

Study site and area attributes

6.3.14 **Landform**: Sloping topography ascending north to south. Forms part of the sloping pastures at the lower margins of the escarpment which contains the main settlement area of Cheltenham. Small to medium scale landscape.

6.3.15 **Land Use**: Formerly improved pasture.

6.3.16 **Land Cover**: Generally open but a cluster of mature trees of mixed condition which make a positive contribution to the character of the site. Many of the trees follow former and part existing hedge lines close to the former farmstead. Please refer to the arboricultural survey.

6.3.17 **Settlement pattern**: The main settlement of Cheltenham is broadly nucleated in pattern.

6.3.18 **Enclosure:** Hedges and hedgerows. Some post and wire where hedges no longer present or gappy Original GCHQ Oakley security fence still in place along parts of northern site boundary adding to a very degraded boundary with new residential area along much of older northern boundary.

6.3.19 **Time depth**: Good sense of time depth due to trees, hedgerows, visual links with upper scarp landscape. Possible ridge and furrow on more elevated land but not seen clearly during field survey. Two largest fields were previously divided by a field hedge which has now been lost. The line of the hedge traverses the site from the north east to the centre of the site.

6.3.20 **Scale**: Small to medium scale fields are enclosed by predominantly two storey residential development on 3 sides with mature on-site boundary vegetation.

6.3.21 **Relationship to built form/settlement**: The site is contained by the present settlement edge on three sides. This edge is modern and still being created. Adjoining residential areas north of site are very prominent and a detractor to the rural character. Overall the impact of the new housing on the former GCHQ Oakley site has a substantial effect on local character and visual amenity. It has created a stark and harsh edge with the AONB at its interface including that with the study site.

6.3.22 **Amenity/Recreational use**: No public access other than contained PROW. Ryder identifies the site as having medium recreational value. The site offers significant opportunity to provide new public access linking Harp Hill with the Cotswold escarpment and new accessible public open space.

6.3.23 **Perceptual qualities**: Medium tranquillity due to visual and audible influences of existing settlement areas on three sides but particularly to northern margin. Strong sense of elevation with views to north. Strong sense of change with development of land to north and north east.

6.3.24 **Landscape value**: At local level the application site is considered to be of **Regional value**. Whilst the site is situated within the AONB, lower lying ground within the study site has a greater sense of enclosure and a strong influence of existing urbanising features that on a local level degrades landscape character. The lands value arises more from the views it affords to the escarpment to the north than its rural characteristics although trees form a backdrop to views from the newer Oakley residential area.

6.3.25 A summary of the main features that comprise the character of the study site and its immediate context are as follows:

- Farmstead

- Trees
- Hedges and Hedgerows
- Improved pasture
- Residential margins
- Hewlett's Reservoir
- Harp Hill

Confirmation of Landscape Receptors

6.3.26 Confirmed landscape receptors to be assessed are set out below with accompanying notes, assessment of susceptibility and value:

Escarpment Landscape Character Type

6.3.27 The escarpment landscape character type is representative of the local AONB landscape generally and is therefore included to assess potential effects on the AONB. It is a widely varying landscape where adjoining existing settlement with characteristics both of the rural and settled landscape. This is particularly notable at the lower elevation where the foot slopes of the escarpment transition to become more gentle sloping pasture. This is in the context of much steeper slopes found to the east and north of the study site such as adjoining Cleeve Common or Prestbury. The varying landscape of the escarpment are generally united by their extensive and panoramic views of both higher escarpment and lower vale. The escarpment landscape character type is assessed to have a **medium high** susceptibility and to have a **regional** value where adjoining major settlement area.

Oakley Pasture Slopes

6.3.28 This landscape character area is identified by the assessment undertaken by Cheltenham Borough Council and identifies the varied character of the settled and unsettled land forming part or lying close to the former GCHQ Oakley site. It is a transitional landscape from the rural higher escarpment to the settled vale and urban area of Cheltenham. It combines both rural and urban characteristics introducing high quality features and detractors frequently into the landscape. As such it has potential for both higher and lower landscape sensitivity with swift transition between the two. The Oakley Pasture Slopes character area is assessed to have a **medium** susceptibility and to have **regional value**.

Sloping fields of Improved Pasture

6.3.29 The fields which comprise the site were considered to be unmanaged former improved pasture at the time of the site visit. Fields to the north of the site were strongly influenced by the adjacent urban edge experiencing a stronger sense of containment due to their less elevated position. The application site fields are open in character and primarily defined by mature hedgerows. In places boundaries are defined by post and wire and former GCHQ Oakley security fencing. The landform gently rises from the north west corner up to the Harp Hill Road boundary, with low lying land along the northern margin of the site. The southern part of the site is more elevated with a weaker sense of enclosure. The pastural fields are considered to be in a moderate to poor intactness. They are not locally rare or have significant local distinctiveness. Whilst the land use of the study site remains agricultural pasture, the land is isolated from the open wider countryside by the physical engineering structures of Hewletts Reservoir. The smaller scale and sloping nature of the land suggests that the site is no longer practical for commercial farming and there is a threat of slow decline to the structures and appearance through future neglect. Overall Sloping Fields of Improved pasture are considered to have **Regional value** due to their contribution to the AONB landscape and a **medium susceptibility** to change.

Farmstead

6.3.30 The former farmstead was in a derelict condition at the time of the site survey and was a detractor within the local landscape. It is considered to have **low susceptibility** to the proposed change due to its poor condition and derelict nature and to be of **local value.**

Hedges and hedgerow

6.3.31 The study site has mature hedgerow boundaries with intermittent mature hedgerow trees. Hedges have been predominantly well clipped to maintain practical agricultural fields, creating on open and exposed landscape. There is a grouping of trees to the north of the farmstead on the site of a former small-scale pasture field. Field hedges are considered to be in moderate to poor condition with sections of dense hedge but areas where vegetation is missing or in significant decline. The site hedge along Harp Hill is partly degraded but has a consistent structure and density. Hedgerow boundaries are notably weak adjacent to areas of more recent residential development. In these locations ornamental hedge species can be found as remnants of a more formal garden treatment to the landscape closer to the former farmhouse. A number of ornamental plant species are also noted along the former access track having probably escaped from neighbouring residential properties.

6.3.32 Hedges and hedgerows are considered to have a **medium susceptibility**. Hedges and hedgerow contribute to the desirable characteristics of the area when without ornamental species and in a moderate to good condition. As such they are assessed to be of **sub regional value** due to their contribution to the wider local character. Hedgerows and hedges contribute to a greater sense of time depth and contribute to the rural character of the site and that of the AONB.

Trees

6.3.33 The site contains a number of large and well established trees which are protected by Tree Preservation Order. These make a positive contribution to the character of the site and local area particularly the newer residential areas to the north of the study site. All TPO trees are identified to be retained within a development. The trees are assessed to have a **high** susceptibility and to have a **sub regional** value.

Residential Margins

6.3.34 The study site is bordered by settled residential areas to its northern, southern and western margins. Part of the eastern margin adjoins the newer Oakley residential area where it lies immediately east of the reservoir. Settlement features including highways, dwellings, gardens, external lighting and boundary treatments are generally urbanising features which reduce the sense of remoteness and tranquillity of the site. The scale and character of the existing residential area to the immediate north of the study site is particularly notable due to the poorer quality boundary. The residential margins are assessed to have a **low** susceptibility and to have a **local** value.

Hewlett's Reservoir

6.3.35 The reservoir forms part of the eastern border to site at its higher elevation close to Harp Hill. The border is simple and open with the listed pavilion a feature of the immediate landscape. The elevated location is more rural in character and a stronger relationship with the wider countryside to the east. The listed structures of the reservoir are assessed to have a **medium** susceptibility and to have a **district** value.

Harp Hill

6.3.36 Harp Hill forms the southern boundary to the site along its entire length. The highway is characterisied by a steeply ascending hill which plateau's just after passing the south western corner of the study site. It is a well contained road with established residential dwellings set predominately to the south of the road in the vicinity of the study site. To the west of the study site dwellings are located on both sides of the road. The road generally has an urban character which becomes semi rural approaching the reservoir. The road is assessed to have a **low** susceptibility and to have a **local** value.

Summary of landscape character

6.3.37 The features of the study site are predominately rural in nature but are predominately contained by settlement features which detract from the qualities of the wider rural agricultural landscape found to the east of Harp Hill as it passes Hewlett's Reservoir. The study site being cut off from this wider rural landscape has characteristics less associated with the escarpment landscape character type and more associated with the Oakley Pasture Slopes. The influence of the sloping topography is significant on the landscape character of the study site. At higher elevation the site has a strong visual relationship with the wider escarpment landscape, it has large and open skies and has less settlement features which detract from a rural character. However, at lower elevation, views are limited and confined with new residential settlement prominent within the setting and much stronger sense of being close to the urban area of Cheltenham. As such the character of the study site varies considerably and can be seen to have a correlation with the site topography with landscape sensitivity increasing with elevation (north to south) and from west to east.

6.3.38 The boundary hedgerows, established mature trees and the open pasture on the elevated areas south (upper slope) of the trees are assessed to make the greatest contribution to the site and local landscape character. The lower areas of the site including former farmstead, yards and lower slopes adjoining the visually prominent newer settlement of Oakley making the least contribution to the landscape character of the site and locality. That being stated, the trees make an important contribution to the landscape setting of the Oakley residential development.

Area of Study

6.3.39 The area of study for the identification and assessment of the visual baseline was established through desktop studies, production of a digital visibility map (ZTV) and the scoping opinion of the local authority. The latter identifies potential views from the following:

- Charlton Kings Footpath 12
- Southam Footpath 102
- Southam Footpath 116
- Cheltenham Footpath 86
- Harp Hill

6.3.40 The scope of the visual assessment was also informed by the 'Key Visual Receptors' identified in the 'Cheltenham Borough Council Landscape Character and Sensitivity Assessment of Cotswolds AONB assessment of land parcel 7.1 Oakley Farm Pasture Slopes. The assessment identifies key visual receptors as:

- Residents along northern boundary of the site (along Pillowell Close and Brockweir Road)
- Residents along western boundary of the site (along Wessex Drive)
- Residents along the southern boundary of the area (along Harp Hill)

- Footpath users along the path that runs the western boundary of the area (ZCH/86/1)

6.3.41 As views from footpaths and open spaces are generally experienced whilst moving, they have potential to rapidly and frequently change because of changes in direction, focal points, topography and landcover. Viewpoint photographs included in this assessment have generally been chosen to be representative of the views generally experienced and also represent the most prominent view of a study site that maybe experienced by a visual receptor. Where a viewpoint photograph is included in this assessment, Chartered Landscape Architects will have walked the entire length of a footpath or open space and made an assessment considering the entire length of a footpath/open space.

6.3.42 A ZTV was produced based on a 12.5m height parameter to represent generic development proposals for development slightly exceeding those illustrated in the development parameter plans. The ZTV used a 1:25000 Ordnance survey (OS) map base showing an area up to 10km radius of the site boundary. The ZTV uses OS Landform Profile data. Please refer to **Appendix 6.1 Figure 6.2**. The ZTV illustrates the zone of theoretical visibility based on landform without obstructing landcover such as woodlands, hedges and built form. The digital exercise assisted with identifying potential areas with views of the site within 10km radius of the application site boundary.

Desk Study; identification of receptors

6.3.43 Review of topographical survey information, aerial photographs, ZTV, Ordnance Survey maps and contours identified the following potential visual receptors:

- Users of Harp Hill Road
- Walkers PROW CH/86/1 (Immediate west of site)
- Walkers Cheltenham Circular Walk (east and north east of site)
- Walkers Cotswolds Way (east and north east of the site)
- Walkers Cleeve Common (north east of site)
- Walkers Aggs Hill (east of site)
- Residents Harp Hill (north of site)
- Residents Wessex Drive (west of site)
- Residents Pillowell Close (north of site)
- Residents Brockweir Road and Clearwell Close (North of site)
- Residents of Birdlip Road (North of site)
- Users of the B4075 Road Sainsbury's junction (North west of site)

Site Survey; identification of receptors

6.3.44 Following the desk study identification of potential visual receptors, the list was further refined during a site walkover by two Chartered landscape architects. Consideration to the effects of land cover on the ZTV was made to identify areas where clear views were identifiable. The following visual receptors were confirmed:

- Users of Harp Hill road
- Walkers PROW CH/86/1
- Walkers Cheltenham Circular Walk
- Walkers Cotswolds Way
- Walkers Cleeve Common
- Walkers Aggs Hill
- Residents Harp Hill

- Residents Wessex Drive
- Residents Pillowell Close
- Residents Brockweir Road and Clearwell Close
- Residents of Birdlip Road
- Users of the B4075 Road Sainsbury's junction

6.3.45 Confirmed visual receptors with views of the site were then assessed for viewpoints which provide a good representation of those views from that area; sometimes encompassing several receptors. The locations of these views were identified as viewpoints; from where the visual assessment, notes and photographs of the view were recorded.

6.3.46 Please refer to **Appendix 6.1 Figure 6.1** for local viewpoint photograph locations.

6.3.47 Please refer to **Appendix 6.1 Figures 6.8 to 6.36** Viewpoint photographs.

Description of views

Users of Harp Hill Road

6.3.48 Motorists and pedestrians on Harp Hill (represented by viewpoints 1 and 2 Appendix 6.1) experience generally incidental views over hedge both long distance towards Cleeve Common and short distance across the site towards the reservoir structures and pavilion. Views into the lower lying residential areas to the north are limited to breaks in hedges. Views from Harp Hill are considered to have high value due to the AONB designated landscape in which they are situated and quality of the views to Cleeve Common. Partial, transient views of the study site are experienced at close distance through intermittent gaps in the hedgerow. Visual receptors are considered to be of **medium high susceptibility** as users of an access road to leisure resources within the AONB experiencing **regional value** views.

Walkers on PROW CH/86/1

6.3.49 Visual receptors on PROW CH/86/1 are users of public rights of way to the west of the study site (represented by viewpoints 3 Appendix 6.1). Views experienced are generally incidental views over the hedge, long distance views are experienced over the site from the upper length of the path. These views are considered to be sensitive due to the value AONB designated landscape from which they are experienced and high susceptibility of walkers within this landscape to changes within that landscape. Transient full views of the western fields of the study site are experience at closed distance through intermittent gaps in the hedgerow. Visual receptors are considered to be of **high susceptibility** experiencing **regional value** views.

Walkers on Cheltenham Circular Walk

6.3.50 Cheltenham Circular Walk is located to the east of the study site and is located within the AONB (represented by viewpoints 9 and 10 Appendix 6.1). Views experienced are generally obscured by layers of intervening vegetation and built form due to elevation on the escarpment slope. Visual receptors are considered to be of **high susceptibility** experiencing **regional value (high)** views.

Walkers on the Cotswold Way National Trail

6.3.51 The Cotswold Way is situated on elevated ground to the east and north east of the study site (represented by viewpoints 11 and 12, 20 & 21 Appendix 6.1). Long distance

views with site seen as part of broad panoramic. The site is seen as forming a green wedge which extends into the urban area. The urban context is visually prominent, but this accentuates the open green character of the site seen at distance from the north and north east. From this footpath full views of the study site are experienced surrounded by settlement. The site forms a very minor portion of the view and is experienced at distance. Views from the path are generally long and expansive with views towards the Cotswold escarpment and Leckhampton Hill to the south. Visual receptors are considered to be of **high susceptibility** experiencing **regional value (high)** views.

Walkers on Cleeve Common

6.3.52 Cleeve Common is situated on elevated ground to the north east of the study site (represented by viewpoints 12 Appendix 3.1). Long distance views are experienced with the site seen as part of a broad panoramic. The site is seen as forming a green wedge which informs the setting of the urban area. The urban context visually prominent but this accentuates the open green character of the site seen at distance from the north and north east. From this footpath full views of the study site are experienced surrounded by settlement. The site forms a very minor portion of the view and is experienced at distance. Views from the path are generally long and expansive with views towards the Cotswold escarpment and Leckhampton Hill to the south. Visual receptors are considered to be of **high susceptibility** experiencing **regional value (high)** views.

Walkers on Aggs Hill

6.3.53 Aggs Hill is a raised area of land to the east of the reservoir. Footpaths descend the hill generally in a south to south west orientation where fine and panoramic views are afforded. The hill is located within the AONB (represented by viewpoints 18 and 19 Appendix 6.1). Views experienced are generally indirect and limited to the more elevated slopes of the study site. Visual receptors are considered to be of **high susceptibility** experiencing **regional value (high)** views.

Residents on Harp Hill

6.3.54 Harp Hill adjoins the southern boundary of the study site (represented by viewpoints 1 and 2 Appendix 6.1). Long distance views are experienced over the site. Middle and lower parts of site are likely to be obscured by topography and landcover. Occasional static partial views of the site are experienced through gaps in intervening vegetation. Residents are considered to be **high susceptibility** experiencing **regional value (high)** views

Residents on Wessex Drive

6.3.55 Wessex drive is situated to the west of the study site (represented by viewpoint 3 Appendix 6.1) Residents within dwellings and gardens are likely to experience very limited views of the site due to changes in level and intervening vegetation. Visual receptors are considered to be of **medium susceptibility** and experience **local value** views of areas predominantly outside of the AONB and not reflective of the valued characteristics of the AONB landscape.

Residents of Pillowell Close

6.3.56 Pillowell Close is located to the north of the study site (represented by viewpoint 4, 16 & 17). Views are likely to be extremely limited by intervening vegetation. Short distance views may be experienced from upper windows into and across site. Visual receptors are considered to be of **medium susceptibility** experiencing **local value** views of areas predominantly outside of the AONB and not reflective of the valued characteristics of the AONB landscape.

Residents of Birdlip Road

6.3.57 Birdlip Road is located to the east of the study site (represented by viewpoints 7 and 8 Appendix 6.1). Short distance views are likely to be afforded from upper windows into the site views are largely contained to the eastern portion of the site by significant corridors of onsite vegetation. This visual receptor is considered to be of **medium susceptibility** experiencing **local value** views of areas predominantly outside of the AONB.

Residents of Brockweir Road and Clearwell Gardens

6.3.58 Brockweir Road and Clearwell Gardens are located to the north of the study site (represented by viewpoints 5 and 6 Appendix 1). Views experienced are likely to be limited due to intervening vegetation and changes in landform. Short distance views may be afforded from upper windows into the site or of the crowns of site trees particularly in areas where boundary hedgerow is weak. These visual receptors are considered to be of **high susceptibility** experiencing **local value** views.

Users of B4075 Sainsbury's junction and other residential views from the wider urban area

6.3.59 Users of the B4075 Sainsbury's junction are located approximately 250 metres to the north west of the study site (Represented by viewpoints 13, 14 & 15 Appendix 6.1). Users of the B4075 with experience transient partial views of the higher ground along the southern portion of the study site, seen above existing rooftops of residential and commercial built form. Residents in the wider urban area may experience partial views from upper storey windows of the higher ground of the study site. Visual receptors are considered to be of **medium susceptibility** experiencing **local value** views.

Users of Public Right of Way off Aggs Hill

6.3.60 Users of the public right of way which ascends fields off Aggs Hill experience views towards Harp Hill and the elevated landscape of the southern site margin (Represented by viewpoints 18 & 19 Appendix 6.1). Views are seen in the context of the urban area and focus particularly on the green and open land of the reservoir. Visual receptors are considered to be of **high susceptibility** and experience **regional value** views within the AONB.

Summary of Visual Baseline Analysis

6.3.61 The study site has varied visual prominence due to the nature of the topography, established landcover and location of potential sensitive visual receptors. The lower lying areas of the site in the vicinity of the former farmhouse have limited visual prominence although there are local views from the adjoining residential areas of the lower pasture and established trees. As the land ascends towards Harp Hill, the visual prominence increases and extends to long distance views from the edge of Cleeve Common and the escarpment southwards towards the study site. From these views the site is experienced as part of a 'green wedge' of land that extends from the landscape east of the study area through the reservoir and into the general urban area.

6.3.62 At higher elevation the land is seen to separate the well treed settled landscape of Battledown Hill from the wider Cheltenham urban area. In particular the recent residential development at Oakley is prominent in the foreground of all long distance views from the Cotswold Way, Cleeve Common and the escarpment generally. In contrast in views from Harp Hill the study site is characterised by its openness which permits long views to the north and north east over the site. In these views the main urban area is predominately is predominately hidden due to topography and screening from the roadside hedgerow.

6.3.63 In all views, the study site is either experienced from within an urban location or in the context of the wider Cheltenham urban area.

6.4 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

Construction

6.4.1 Construction effects will be temporary, and it is assumed will be associated with a multi phased period of construction. The effects will predominately consist of activity and vehicle movements seen against an existing rural landscape. The likely effects of the construction phase will comprise:

- Construction compound for delivery and storage of materials introduced to the present open fields
- Temporary parking
- Introduction of spoil heaps and temporary earthworks
- Temporary buildings such as 'portacabins' and storage containers
- Security fencing such as hoarding and 'Heras' fencing
- Noise and movement associated with vehicles and machinery
- Large machinery such as excavation plant
- Extensive initial groundworks (cut and fill) to facilitate access road and to form formations for new dwellings

Mitigation

6.4.2 Construction effects will be partially mitigated by the conservation of the existing trees and hedgerows which screen lower slopes in views from the east and north east including confirmed sensitive visual receptors on the escarpment. Topography will also obscure the majority of construction effects from Harp Hill although new access and movement of construction traffic will introduce new activity.

6.4.3 Construction effects have potential for greatest effects adjoining the existing residential areas of Pillowell Close and Wessex Drive where trees and hedges are more limited, and activities may be seen in open views into the site.

6.4.4 Overall the construction effects are assessed to be temporary but have Moderate Adverse effects on both landscape and visual receptors. Mitigation of construction effects will be predominately achieved through the retention of site trees and hedgerows which, in conjunction with topography will contain effects to a local environment generally immediately surrounding the study site including residential properties immediately adjoining.

Assessment of landscape effects

6.4.5 The landscape receptors identified in Appendix 6.4 Table 6.1 are assessed for their sensitivity by consideration of their susceptibility to change as a result of the proposal (high medium or low) and the value of the landscape receptor. The overall sensitivity of the landscape receptor is assessed using criteria set out in the methodology.

2D: Coopers Hill to Winchcombe Escarpment LCA

6.4.6 The study site does not fully reflect the published characteristics of the Escarpment LCA as recognised in the Cheltenham Borough Council sensitivity assessment. The sloping pastures are more typical of the transitional landscape at the interface of the escarpment with the vale and urban landscape.

6.4.7 The Escarpment: Coopers Hill to Winchcombe landscape character area forms a distinctive part of the Cotswolds AONB so is therefore assessed to have **regional** value. The study site itself forms a small portion of this character area and is situated within an urban context somewhat separated from the wider character area by Hewlett's Reservoir and areas of residential development. The overall sensitivity is therefore considered to be **medium high** in this location. The proposals will result in a small loss of sloping pasture to development which will appear as an extension of the adjoining settlement. It will be balanced by the restoration of a species rich grassland at higher elevation to emulate the escarpment grasslands found locally. This new area of species rich grassland will be made public accessible to open up new public views and provide alternative leisure and recreational resource within the AONB. The magnitude of effect is expected to be **low/negligible**.

6.4.8 The significance of effects is assessed to be **Minor Adverse** reflecting the loss of pasture to settlement extension.

7.1: Oakley Farm Pasture Slopes

6.4.9 The study site covers the entirety of Oakley Farm Pasture Slopes and is characterised by sloping topography with agricultural pasture landcover and predominantly hedgerow boundaries in medium to poor condition with areas where boundaries are degraded particularly where bordering adjacent residential development. Overall sensitivity is considered to be **Medium high**. The effects of development will largely be contained to the less sensitive areas of the site with important trees and hedgerows being retained and strengthened as part of the development. The development will extend the existing settlement into the pasture and be robustly separated from the more sensitive higher ground adjoining the reservoir and Harp Hill. This separate will strengthen what is presently a weak settlement boundary at the interface with Oakley. The development is considered to have a **medium** magnitude of effect on this resource.

6.4.10 The significance of effects is assessed to be **Moderate Adverse** reflecting the loss of pasture to settlement extension.

Sloping Pasture

6.4.11 The sloping fields contribute to the rural character of the landscape and facilitate long distance views across the site at elevation. Overall this resource is considered to have a **Medium high** sensitivity to change. The declining condition of this resource means that it contributes less than they could to the character of the site and development provides an opportunity to enhance and restore. Development is contained to the southern less sensitive areas of this resource where the character is already influenced by urban form. Overall the development is considered to have a **medium** magnitude of effect on this resource when balanced against the benefit arising from the restoration of a species rich grassland on the higher land.

6.4.12 The significance of effects is assessed to be **Moderate Adverse** reflecting the loss of pasture to settlement extension but in the longer term with sward enhancement to the retained areas of pasture giving rise to a **Minor Adverse** effect.

Hedges and hedgerows

6.4.13 Site hedges and hedgerows are in a mixed condition with poorer quality hedges frequently adjoining the western and northern boundaries. Internal hedges are particularly poor quality generally. Hedges and hedgerows do contribute to the desirable characteristics of the locality so are generally to be retained and restored. In addition, they are to be linked to new green infrastructure which will provide a new green corridor east/west across the site providing a strengthened network of hedgerows, species rich

grassland, existing and new tree belt. Overall site hedges and hedgerows are assessed to have **medium** sensitivity to change but experience a **low** magnitude of change.

6.4.14 The significance of effects is assessed to be **Minor Adverse** at outset of the development but benefiting from additional planting and management are assessed to give rise to a **Minor Beneficial** effect.

Trees

6.4.15 Site trees are predominately protected by Tree Preservation Orders and are to be meaningfully retained within the development proposals. In addition, a significant belt of new tree planting is intended to mitigate groundworks and to create a new, robust edge to the southern up slope edge of the settlement extension. This new tree belt will allow green corridors to be created between existing hedgerows, field trees and new species rich grassland which is intended to reinforce the landscape character of the undeveloped site area whilst providing the setting to the new dwellings. The sensitivity of the trees is assessed to be **Medium High** and magnitude of change predicted to be **low**.

6.4.16 The significance of effects is assessed to be **Minor Adverse** at outset due to loss of pasture setting but in the longer term with the establishment of the tree planting and grassland is predicted to give rise to a **Minor Beneficial** effect

Residential margins

6.4.17 The residential margins of the study site fall outside of the AONB and are not within a Conservation Area. They are generally accompanied with established gardens and or amenity area which provide space between the study site and the existing settlement dwellings. The sensitivity of the residential margins is assessed to be **medium** in this location. The development proposals extend the pattern of settlement found to the north of the site but make little change to the settlement pattern to the west or of Harp Hill. In addition, mitigation planting will strengthen this separation particularly through hedgerow restoration and new strategic tree belt and open grassland. As such the magnitude of effect is assessed to be **low**.

6.4.18 The significance of effects is assessed to be **Minor Adverse** reflecting the part loss of open setting that may be experienced to the settlement margin to the north of the site.

Hewletts Reservoir

6.4.19 The structures and features of Hewletts Reservoir are engineered but maintain a green space adjoining Harp Hill which forms a link between the study site and the wider Cotswolds countryside. As such the sensitivity of the reservoir features is assessed to be **medium**. The development proposals maintain open grassland and existing hedgerow boundaries adjoining and to the west so that its present open setting is conserved. Development proposals are predominately separated and screened by proposed extensive new tree belt. As such the magnitude of effect is assessed to be Negligible.

6.4.20 The significance of effects is assessed to be **Negligible** due to conservation of the existing landscape setting.

Harp Hill

6.4.21 Harp Hill is predominately urban in character but benefits from extensive rural views in the location of the study site. The sensitivity of this urban highway corridor is assessed to be **medium**. The development proposals are kept to the lower ground to the north and away from the plateau of land which allows the open views across the vale to

the high ground of the escarpment. New development will be partly immediately screened by the existing topography and hedgerow adjoining the highway. The additional strategic tree belt will further screen new development from Harp Hill along with views of existing residential development at Oakley. The proposed access and its junction with Harp Hill will partly introduce an urbanising feature but at the same time will open up long rural views from the highway to the north. As such the magnitude of effect is assessed to be **Medium** immediately adjoining the site access but likely to be negligible along much of the existing highway.

6.4.22 The significance of effects is assessed to be **Minor Adverse** reflecting the introduction of the development access.

Assessment of visual effects

Users of Harp Hill

6.4.23 Road users are considered to have **medium high** susceptibility due to their use of an access road to recreational facilities within the AONB, but generally experiencing limited views of the AONB landscape due to hedgerows. Views are assessed to be of **local** value. Overall sensitivity for these receptors is considered to be **medium**. Views will be indirect, transient and predominately screened by existing hedgerow only a short section of hedgerow is to be removed to provide access but it is predicted that new views of new built form will be experienced from Harp Hill. The overall magnitude of change experienced by road users by the proposals is considered to be **low**.

6.4.24 The significance of effects is assessed to be **Minor Adverse**.

Walkers using PROW CH/86/1

6.4.25 Walkers are considered to have **high** susceptibility, experiencing views of **regional** value. Overall sensitivity for these receptors is considered to be **high**. Views will generally be indirect, transient and partly screened by restored hedgerow on the site boundary but overall walkers will experience a loss of openness in views through immediately adjoining vegetation and into the pasture. A potential link between this footpath and the proposed open amenity grassland along Harp Hill will give greater opportunity to walkers to remain off the highway and enjoy wider views from the higher ground. Overall the magnitude of effect is assessed to be **medium**.

6.4.26 The significance of effects is assessed to be **Major Adverse** decreasing to moderate adverse with the establishment of the new grassland and tree belt.

Walkers using the Cheltenham Circular Walk

6.4.27 Walkers are assessed to have a **high** susceptibility and to enjoy **regional** value views. Overall sensitivity for these receptors is assessed to be **high**. Walkers obtain very limited views from the mid elevation escarpment location of the circular walk with most local views being obscured by vegetation and settlement features. As such the magnitude of effect is assessed to be **negligible**.

6.4.28 The significance of effects is assessed to be **Negligible**.

Walkers on the Cotswold Way

6.4.29 Walkers are assessed to have a **high** susceptibility and to enjoy **regional** value views. Overall sensitivity for these receptors is assessed to be **high**. Walkers experience expansive and panoramic views across the escarpment and across the wider Cheltenham urban area and vale beyond. The study site is identifiable and the lower slope of the site

would be seen to developed as an extension of the Oakley residential area, contained by a well treed backdrop. The extent of the change is small in the context of the panoramic view. The magnitude of effect is assessed to be **low**.

6.4.30 The significance of effects is assessed to be **Moderate Adverse** reducing to **minor adverse** on establishment of the mitigating green infrastructure.

Walkers on Cleeve Common

6.4.31 Walkers are assessed to have a **high** susceptibility and to enjoy **regional** value views. Overall sensitivity for these receptors is assessed to be **high**. Walkers experience expansive and panoramic views across the escarpment and across the wider Cheltenham urban area and vale beyond. The study site is identifiable, and the lower slope of the site would be seen to developed as an extension of the Oakley residential area, contained by a well treed backdrop. The extent of the change is small in the context of the panoramic and long distance view. The magnitude of effect is assessed to be **low**.

6.4.32 The significance of effects is assessed to be **Moderate Adverse** reducing to **minor adverse** on establishment of the mitigating green infrastructure.

Walkers on Aggs Hill

6.4.33 Walkers are assessed to have a **high** susceptibility and to enjoy **regional** value views. Overall sensitivity for these receptors is assessed to be **high**. Walkers experience expansive and panoramic views to the south including south west towards the study site at its union with Harp Hill. The more elevated slopes of the study site are identifiable beyond the reservoir. The lower slopes are generally obscured through landcover and topography. Only a very limited amount of new built form is likely to be seen with the open slopes adjoining Harp Hill seen to be retained predominately unchanged. The access may be partly identifiable seen in the context of well treed settlement. The extent of the change is small in the context of the panoramic and long distance view. The magnitude of effect is assessed to be **low/negligible**.

6.4.34 The significance of effects is assessed to be **Minor Adverse** reducing to **Negligible** on establishment of the mitigating green infrastructure.

Residents on Harp Hill

6.4.35 Residents with elevated north facing windows may experience long distance views over the road and adjoining hedgerow. Residents are assessed to have a **high** susceptibility and to enjoy **local** value views. Overall residents are assessed to have a **high** visual sensitivity in this location. The retention of open grassland on the upper slopes of the study site and provision of an extensive tree belt along between the receptors and potential new built form will predominately screen views of the lower slopes including the newer areas of the Oakley residential development. This retains exiting long distance views to the north and north east and their rural setting. Views of the new access road and junction with Harp Hill may be visible to a number of residents immediately north. Although the road introduces an urbanising feature this will be seen in the context of the existing road which is urban in character in this location. Overall the magnitude of effect is assessed to be **low/negligible**.

6.4.36 The significance of effects is assessed to be **Minor Adverse**.

Residents on Wessex Drive

6.4.37 Residents on Wessex Drive are generally separated from the study site by changes in level and boundary/garden so experience limited views. Where there are

glimpsed or open views then development proposals are likely to be seen in conjunction with mitigation planting and hedgerow restoration. Although the rural character can be conserved through screening the loss of openness cannot be mitigated. Overall residents are assessed to have a **medium** visual sensitivity but will experience a **low** magnitude of effect.

6.4.38 The significance of effects is assessed to be **Minor Adverse**.

Residents on Pillowell Close

6.4.39 Residents on Pillowell Close immediately adjoining will experience views into the site over boundary vegetation. These views will be reduced by new green infrastructure and restoration of existing native hedgerows and some new built form will be seen within the site. Mitigation planting can conserve the verdant setting to Pillowell Close but cannot mitigate loss of openness where presently seen in views. Residents are assessed to have **medium** sensitivity in this location and will experience a **medium** magnitude of effect.

6.4.40 The significance of effects is assessed to be **Moderate Adverse**.

Residents on Brockweir Road and Clearwell Close

6.4.41 Existing views are generally contained by study site trees and experienced over local public open space. Views of new built form would be seen through new boundary hedgerow and tree belt planting. This will conserve the verdant backdrop to the views but cannot mitigate loss of openness. Overall residents are assessed to have **medium** sensitivity and to experience a **medium** magnitude of effect.

6.4.42 The significance of effects is assessed to be **Moderate Adverse**.

Residents on Birdlip Road

6.4.43 Residents generally experience limited views into the site due to panel fencing along the boundary. Views will be greater from 1st floor windows where dwellings adjoin the boundary. View are generally limited by tree canopy but may extend into the pasture in some locations. Views of new built form would be seen through new boundary hedgerow and tree belt planting. This will conserve the verdant backdrop to the views but cannot mitigate loss of openness. Overall residents are assessed to have **medium** sensitivity and to experience a **medium** magnitude of effect.

6.4.44 The significance of effects is assessed to be **Moderate Adverse**.

Users of the B4075 Priors Road

6.4.45 Users of Priors Road and associated spaces including store car park and local amenity areas may have indirect or direct views towards the site but all are generally experienced as transient and incidental. Priors Road and associated spaces are within the urban area and are correspondingly active and generally separated from the open countryside that surrounds the settlement generally. New built form and mitigation planting will be identifiable, replacing glimpsed view of sloping pasture. This is likely to be a minor change in an overall urban view where built form within a well treed setting is a frequent backdrop and informs local settlement character. Overall visual receptors are assessed to have **medium** sensitivity and to experience a **low** magnitude of effect.

6.4.46 The significance of effects is assessed to be **Minor Adverse**.

6.5 MITIGATION AND ENHANCEMENT

Inherent Mitigation

6.5.1 Inherent mitigation incorporated into the development parameters is assessed to be of greater importance to conserving the landscape character and visual amenity than measures introduced in response to identified effects of development. These predominately include the boundary hedgerows, established mature trees and areas of sloping pasture which have the greatest sensitivity due to effect on character and particularly visual amenity.

6.5.2 The existing hedgerows provide important mitigation to views from Harp Hill to the south and from the public right of way and residential area (Wessex Drive) to the west. Existing hedgerows are also important to conserve visual amenity from the Oakley Grange residential area particularly Pillowell Close.

6.5.3 The mature trees provide important inherent mitigation for views from the east and north east where they are seen to obscure the lower slope areas of the study site. These trees play an important role in protecting the visual amenity of views toward the study site from within the AONB.

6.5.4 The retained open sloping pasture adjoining Harp Hill is important both to retain key views to the north and north east from Harp Hill and to conserve the setting of the AONB seen in views from Cleeve Common southwards. This retention of an area of broad open grassland preserves the finger of green land that is seen in conjunction with the reservoir site which informs the landscape setting of the settled landscape of Battledown Hill and the wider settlement setting.

Proposed Mitigation

6.5.5 The introduction of a strategic belt of new tree planting across the site (west to east) is proposed to create a robust edge to the development and in association with the retained grassland, conserve the rural character of the landscape adjoining Harp Hill. This is primarily intended to protect the setting of the AONB seen from the elevated viewpoints along the escarpment but it also conserves the rural character of Harp Hill at its point of transition from an urban to predominately rural character.

6.5.6 The central tree belt is also intended to mitigate potential effects (landscape and visual) arising from groundworks to lower and mid slope areas which may be required to achieve practical development. The tree belt will separate the development area from the open grassland so that changes in finished site level will have no impact on the character of the upper slope landscape or visual amenity of views from the Cotswolds escarpment.

6.5.7 Further tree belt and hedge planting is suggested to conserve a verdant outlook from the margins of the Oakley Grange residential area. It is accepted that mitigation measures will not be able to address loss of openness in existing views but mitigation measures can conserve their verdant setting and protect visual amenity and privacy.

Enhancements arising from development

6.5.8 There are a number of important enhancement opportunities that arise from the development of the study site which are set out below:

- The retention of a large swathe of open pasture provides an opportunity to establish through long term management, a diverse meadow sward which reflects those found along the escarpment to the north east of the study site.
- Public access to the open site amenity areas can allow public access to views presently inaccessible

- Public access to the open site amenity areas and green links to the existing public rights of way can provide a safe and alternative route for both pedestrians and cyclists away from Harp Hill. This includes practical and attractive routes from Harp Hill to Prior Road shops and services.
- Public access to the open site amenity area can be utilised for leisure and recreational activities which might otherwise not be available within walking distance locally.
- Restoration of hedgerows and grassland connected to the established trees via new green infrastructure corridors can provide opportunities to establish diverse new habitat and strengthen existing habitats.
- New green infrastructure across the middle slope areas of the site will conserve views to the north and east from more elevated areas of the site and Harp Hill but can also provide an improved screen of the existing Oakley Grange settlement area. This can both improve the quality of existing views and improve the rural character of the view foreground.

6.6 CUMULATIVE AND IN COMBINATION EFFECTS

Cumulative Schemes

6.6.1 A number of recent existing and approved schemes for residential development are located within close proximity to the study site. These are listed below:

- Oakley Grange/GCHQ Oakley residential developments 06/00380/REM, 07/01465/REM, 06/00352/REM, 13/01683/REM and 07/01296/REM
- Cromwell Court, Greenway lane 18/02581/FUL
- Bouncers Lane 17/00929/OUT

6.6.2 In addition, the emerging Local Plan identifies proposed housing allocations as follows:

- HD7 200m north of the study site
- HD4 700m south west of the study site
- HD3 550m north of the study site

6.6.3 The study site through its geographical location has a strong relationship with the Oakley Grange residential area as it immediately adjoins 3no. of the 5no. developed land parcels. The study site is assessed to have a weaker relationship with Cromwell Court, Bouncers Lane approved developments and proposed allocation sites as they are separated by changes in local landscape and townscape characteristics and visual connectivity. They all share a loose correlation with the eastern settlement edge and its interface with the open countryside including the escarpment which forms the prominent setting to Cheltenham generally. However, in landscape and visual terms these other developments form a very minor part in the context of a much broader and varied urban interface with the rural landscape to the east of Cheltenham.

6.6.4 No significant cumulative landscape and visual effects are therefore identified associated with development either existing or proposed, beyond the Oakley Grange residential area.

Effects of the Oakley Grange residential area on the character and visual amenity of the study site

6.6.5 The development of the Oakley Grange residential parcels created a new and significant settlement edge including Pillowell Close, Brockweir Road and Birdlip Road. Previous to this development the study site had a greater direct relationship with the open countryside to the east although filtered through the former GCHQ structures. The present

Oakley Grange developments has in effect enclosed the study site on its northern and part eastern boundaries creating a robust separation from the open countryside to the east. The development of the eastern and most elevated land parcel forming part of the Oakley Grange development completed separation of the study site from open countryside by connecting to the northern margin of Hewlett's Reservoir. In effect the study site has become an isolated parcel of land which is separated from the open AONB landscape by settlement features.

6.6.6 In landscape and visual terms the settlement boundary if defined by settlement features and connectivity with the wider rural landscape of the AONB is seen to extend up to the road at Aggs Hill, Greenway Lane and Harp Hill to the immediate east of the reservoir.

6.6.7 The effect of the development proposals in this context is that they will be seen to extend the Oakley Grange residential area but that this extension will not be seen to encroach further into the open countryside than the settlement edge has already been established.

6.6.8 Development parameters for the study site identify that development features would not exceed further eastwards than the Oakley Grange development has already established and that development would not exceed heights already established in the Oakley Grange development. As such the development of the study site would be seen to consolidate the urban area of Oakley Grange rather than form a further new and potentially intrusive urban extension into open countryside.

6.6.9 Taking the above into consideration, potential cumulative landscape effects are predicted to have a greater effect on the townscape than on the rural landscape that forms the setting to the western edge of the settlement. This is because the landscape is separated from the wider rural landscape of the AONB and continues a pattern of established settlement that already influences the landscape and visual baseline which informs the impact assessment.

6.6.10 Overall, the development of the study site is not predicted to give rise to significant adverse cumulative (landscape or visual) effects in association with recent or approved residential development that will impact upon the wider Cotswolds AONB or the local escarpment landscape that informs the setting of Cheltenham.

Table 6.6: Summary of Effects, Mitigation and Residual Effects

Receptor/ Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation/ Enhancement Measures	Residual Effects ****
Construction								
Landscape Receptors	Significant loss of tranquillity, introduction of temporary prominent features, temporary activities	Temporary	N/a	N/a	Local	Moderate Adverse	Retention of existing trees and hedgerows will provide some inherent mitigation to conserve character in conjunction with retention of higher slope open pasture	No residential construction effects
Visual Receptors	Introduction of visually prominent temporary features or activities including groundworks, earth moving, temporary structures.	Temporary	N/a	N/a	Local	Moderate Adverse	Topography and retention of existing trees and hedgerows will provide inherent mitigation by screening main areas of activity.	No residential construction effects
Operation								
Landscape receptors	As cumulative and in-combination assessments							
Visual receptors	As cumulative and in-combination assessments							

Receptor/ Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation/ Enhancement Measures	Residual Effects ****
Cumulative and In-combination								
Landscape Receptors								
Escarpment LCT	Small loss of area from agricultural to settlement	Permanent	Medium High	Low/ Negligible	United Kingdom	Minor Adverse	Additional green infrastructure and enhancement of upper slope area	Minor Adverse
Oakley pasture Slopes LCA	Moderate loss of area from agricultural pasture to settlement	Permanent	Medium High	Medium	Regional	Moderate Adverse	Additional green infrastructure and enhancement of upper slope area	Moderate Adverse
Sloping Pasture	Moderate loss but balanced with improvement of retained grassland	Permanent	Medium High	Medium	District	Moderate Adverse	Establishment of permanent diverse grassland	Minor Adverse
Hedges and hedgerows	Some loss of poor hedge but boundaries retained and improved	Permanent	Medium	Low	District	Minor Adverse	Reinforced and managed throughout boundaries	Minor Beneficial
Trees	Retained only loss of field setting	Permanent	Medium High	Low	District	Minor Adverse	New tree planting and long term management	Minor Beneficial
Residential margins	Change to setting predominately to settlement off northern boundary	Permanent	Low	Low	Local	Minor Adverse	New tree and hedgerow planting to conserve setting	Minor Adverse
Hewletts Reservoir	Minor change to setting	Permanent	Medium	Negligible	District	Negligible	New diverse grassland to form replacement setting	Negligible

Receptor/ Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation/ Enhancement Measures	Residual Effects ****
Harp Hill	Creation of new access balanced against improvement to roadside hedgerow and new public access avoiding walking on road	Permanent	Low	Medium	Local	Minor Adverse	Hedgerow restoration and new diverse grassland public amenity area	Minor Adverse
Visual Receptors								
Users of Harp Hill	New access will be visible which will permit a new long distance view to be created	Permanent	Medium High	Low	Local	Moderate Adverse	Restoration of hedgerow and reduction in views of existing Oakley residential area from new green infrastructure	Minor Adverse
Walkers using PRoW CH/86	New development will be experienced on the lower slope which is presently open. Extended green infrastructure will decrease some views to the east but frame new views into the retained open amenity area adjoining Harp Hill	Permanent	High	Medium	Local	Major Adverse	New green infrastructure and strengthening of hedgerow will reduce views of new built form but not replace loss of openness	Moderate Adverse
Walkers using the Cheltenham Circular Walk	Limited changes due to existing screening. Some new development	Permanent	High	Negligible	District	Negligible	Generally screened by existing	Negligible

Receptor/ Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation/ Enhancement Measures	Residual Effects ****
	may be experienced which will be seen in context of existing settlement features						settlement features	
Walkers on the Cotswolds Way	Development on lower slope will be identifiable with loss of openness. New green infrastructure will be identifiable at southern edge of new development	Permanent	High	Low	Regional	Moderate Adverse	Development features will be reduced by new green infrastructure	Minor Adverse
Walkers on Cleeve Common	Development on lower slope will be identifiable with loss of openness. New green infrastructure will be identifiable at southern edge of new development	Permanent	High	Low	Regional	Moderate Adverse	Development features will be reduced by new green infrastructure	Minor Adverse
Walkers on Aggs Hill	Development will be generally obscured in views. With minor built form and part of the access road potentially visible.	Permanent	High	Low/ negligible	Regional	Minor Adverse	Development features will be reduced by new green infrastructure	Negligible
Residents of Harp Hill	New green infrastructure will obscure any existing views of	Permanent	High	Low/ Negligible	Local	Minor Adverse	New green infrastructure will screen development	Minor Adverse

Receptor/ Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation/ Enhancement Measures	Residual Effects ****
	urban area. Potential for part views of access road and its junction with harp Hill						other than access junction with Harp Hill	
Residents of Wessex Drive	Potential increase in boundary vegetation will obscure glimpsed vies into open field. Some residential built form may be seen beyond hedgerow.	Permanent	Medium	Low	Local	Minor Adverse	Restoration of boundary hedgerow and new green infrastructure	Minor Adverse
Residents of Pillowell Close	Some loss of open views into lower pasture. Increase in density of green infrastructure along boundary will further obscure open views but maintain separate and 'green' setting	Permanent	Medium	Medium	Local	Moderate Adverse	New boundary hedgerow will reduce views of new structures but result in some loss of openness	Moderate Adverse
Residents of Birdlip Road	Some loss of open views into lower pasture. Increase in density of green infrastructure along boundary will further obscure open views but	Permanent	Medium	Medium	Local	Moderate Adverse	New boundary hedgerow will reduce views of new structures but result in some loss of openness	Moderate Adverse

Receptor/ Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation/ Enhancement Measures	Residual Effects ****
	maintain separate and 'green' setting							
Residents of Brockweir Road and Clearwell Gardens	Some loss of open views into lower pasture. Increase in density of green infrastructure along boundary will further obscure open views but maintain separate and 'green' setting	Permanent	Medium	Medium	Local	Moderate Adverse	New boundary hedgerow will reduce views of new structures but result in some loss of openness	Moderate Adverse
Users of Priors Road	Some loss of open green field will be seen both from introduction of new built form and extensive new green infrastructure planting.	Permanent	Medium	Low	Local	Minor Adverse	New green infrastructure will soften views of new built form but loss of openness cannot be mitigated	Minor Adverse

6.7 RESIDUAL IMPACTS

Significance of landscape effects

Summary of overall significance of landscape effects during construction and at Year 1

6.7.1 The overall significance of landscape effects during construction and operation will result in a **Minor Adverse** impact of development before mitigation planting has established. A **Moderate Adverse** impact is assessed for the Oakley Pasture Slopes LCA including the sloping pasture of the site. This is due to the loss of pasture. Landscape effects generally are limited by existing influence of the urban area particularly on the character of the lower slope, containment by site hedgerows, extensive mature site trees, nature of the topography and retention of more sensitive elevated sloping pasture. These features contain potential effects to the site and conserve the desirable features which make a positive contribution to local landscape character.

Summary of overall significance of landscape effects at establishment of mitigation measures

6.7.2 With the initial establishment of new green infrastructure and restoration of boundary hedgerows landscape character can be partly conserved but loss of open pasture cannot be mitigated. Overall the significance of landscape effects on establishment of mitigation measures will result in a **Minor Adverse** impact of development. Site trees and hedgerows will see a **Minor Beneficial** impact through restoration and long term management. The Oakley Pasture Slopes LCA will retain a **Moderate Adverse** residual impact through the loss of pasture and introduction of urban features.

Significance of visual effects

Summary of overall significance of visual effects during construction and at year1

Long distance views before mitigation

6.7.3 Overall the significance of visual effects during construction and at operation will result in a **Moderate Adverse** impact of development before mitigation planting has established. This is due to the high susceptibility of visual receptors and value of the views experienced from the elevated viewpoints along the escarpment generally. From Aggs Hill a **Minor Adverse** impact is assessed due to the more indirect and partial view.

Short distance local views before mitigation

6.7.4 Short distance local views are predominately from the existing urban area outside of the AONB with the exception of the footpath immediately west of the study site. Overall significance of visual effects before mitigation measures have established will result in **Moderate Adverse** impacts. A **Major Adverse** impact is assessed for visual receptors using the public right of way immediately west of the study site.

Summary of overall residual significance of visual effects ten years post completion

Long distance views with mitigation

6.7.5 Overall the significance of visual effects at establishment of mitigation measures will result in a **Minor Adverse** impact of development. From Cheltenham Circular Walk and Aggs Hill **Negligible** impacts are assessed.

Short distance local views with mitigation

6.7.6 Overall the significance of visual effects at establishment of mitigation measures will result in a **Minor/Moderate Adverse** impact of development for local, short distance visual receptors.

Final Statement of Significance

6.7.7 Overall the combined residual significance of landscape and visual effects is considered to be **minor/moderate adverse**.

6.8 SUMMARY AND CONCLUSIONS

Summary of findings

6.8.1 The study site consists of a north sloping area of former agricultural land on the existing settlement edge of Cheltenham. The land is bordered by settlement to its northern, southern, western and part eastern boundaries. Hewlett's Reservoir also forms part of the site boundary to the east. Although generally contained by settlement features the land falls within the Cotswolds AONB.

6.8.2 There is no public access to the land although a public right of way is located along the entire western site boundary linking Harp Hill to Priors Road.

6.8.3 Site features consist of sloping former pasture, derelict former farmstead, established hedgerows, hedges and a number of mature trees protected by Tree Preservation Orders. The sloping topography is also a distinctive feature of the study site which forms part of the northern lower slope to Battledown Hill.

6.8.4 The study site lies within National Character Area 106 Severn and Avon Vales and within the sub area Cooper's Hill to Winchcombe Landscape Character Area (2D) of the Escarpment Landscape Character Type (2) as identified in the Cotswolds AONB Landscape Character Assessment. The Landscape Character, Sensitivity and Capacity Assessment of Cotswolds AONB within Cheltenham Borough Administration Area prepared for Cheltenham Borough Council includes an assessment of the study site under LCA7.1 of the appraisal. This identifies the study site as falling within the Oakley Farm Pasture Slopes within the 'Pasture Slopes' Landscape Character Type. The appraisal identifies that the site consists of a small to medium scale landscape with sloping topography within pastoral farmland land use contained by mature hedgerow boundaries. The appraisal also identifies the influence of human activity through residential built development to the north, west and south. Since the appraisal was completed (May 2016) residential development has now extends to part of the eastern site boundary.

6.8.5 Site features are in mixed condition with medium to good quality trees and mixed quality hedgerows.

6.8.6 The landscape value is acknowledged to be high due to the AONB designation. The escarpment landscape character area is predominately rural but in the location of the study site is influenced by the settled landscape of the wider Cheltenham area. As built form and settlement features are a prominent component in the landscape the susceptibility to change is assessed to be slightly reduced from areas where the escarpment remains adjoined with a rural vale landscape. As such this assessment identifies that landscape sensitivity is Medium High when considering medium susceptibility with a high landscape value.

6.8.7 The sloping nature of the study site influences visual prominence with lower slope areas adjoining Oakley Grange having lower visual prominence than the more elevated

areas closer to Harp Hill. On the southern site boundary with Harp Hill the site affords extensive and panoramic views to the north and north east but at lower slopes areas these views are lost due to a combination of topography and established landcover. This has an influence on visual sensitivity of the site with elevated areas being visually prominent particularly from escarpment viewpoints so having a high visual sensitivity. Lower slope areas are not visually prominent and are generally obscured in views into the site from the north and north east areas of the escarpment. As such the lower slope areas are assessed to have a lower visual sensitivity. This variation in potential visual and landscape sensitivity has been used to inform the development parameter plans so that development proposals are proposed within lower sensitivity areas of the study site, allowing higher sensitivity areas to be conserved to protect landscape character and visual amenity generally.

6.8.8 Inherent mitigation measures include the retention and restoration of boundary hedgerows and site trees which in conjunction with the sloping topography create containment of the development and limit views of development features in views from the escarpment. Additional mitigation including a belt of new tree planting across the study site (east to west) is intended to create a robust edge to the development area, maintaining separation with a significant area of retained grassland. This retained grassland is intended to conserve the open and rural character of the study site on its higher slope adjoining Harp Hill. The retention of this open grassland conserves quality of views across the site from Harp Hill and the landscape characteristic of the green wedge of land which includes the reservoir site, seen in long distance views of the study site from the north and north east.

6.8.9 When combined, landscape effects are assessed to be Minor Adverse at year 1 with Moderate adverse effects recorded to the Oakley Pasture Slopes LCA and the sloping pasture of the site. This is due to the physical loss of the pasture to development. On establishment of additional mitigation measures landscape effects remain Minor Adverse with a reduction to Minor Adverse to the Oakley Pasture Slopes LCA due to the restoration of the retained grassland, new public access and establishment of new green infrastructure.

6.8.10 Visual effects when combined are assessed to be Moderate Adverse at year 1 with a Major Adverse assessed for walkers using the public right of way immediately adjoining the western boundary of the study site. With established mitigation measures visual effects reduce to Minor Adverse for visual receptors experiencing long distance views into the site from elevated locations on the Cotswold escarpment, short distance views from harp Hill, Wessex Drive and Priors Road. Moderate Adverse effects remain recorded for short distance views from immediately adjoining dwellings at Oakley Grange as loss of openness cannot be mitigated.

6.8.11 Construction effects on both landscape and visual receptors are assessed to be Moderate Adverse due to visual prominence of temporary features and activities but landscape effects will be contained to the study site.

6.8.12 Cumulative effects are assessed to be less than significant on the wider rural landscape of the AONB due to the influence of the existing Oakley Grange development which has now generally enclosed the study site, creating separation with the wider escarpment landscape and the Cotswolds AONB generally. Other approved or allocated development sites are sufficiently disconnected both visually and in landscape character terms that they will not lead to cumulative landscape or visual effects. There is a cumulative effect of development with the Oakley Grange residential area which results in a consolidation of development at Oakley but this is assessed to strengthen the developing pattern of settlement in this location. As such adverse impacts are limited and predominately reflected in Table 6.6.

Conclusion

6.8.13 The overall landscape and visual effects of the development proposals will result in the loss of sloping pasture which makes a contribution to local landscape character and visual amenity. The harm arising has been assessed and found to be limited by the extent to which the study area is already influenced by settlement features, inherent mitigation through retained vegetation and natural topography and the separation of the study site from the wider escarpment landscape and wider AONB. Potential impacts are predicted to have greater landscape and visual effects on the immediate urban landscape which falls outside of the AONB than on the wider rural landscape within the AONB with exception of the study site itself. The study site contributes to the character and visual amenity of the AONB and to the setting of Cheltenham but not all areas of the study site make the same contribution. The development proposals retain the features which make the greatest contribution and have the highest sensitivity, limiting potential adverse impacts. This confirms that the study site has capacity to accommodate development whilst conserving the wider landscape character and scenic beauty of the AONB in keeping with intentions of both national and local landscape policy.

7 BIODIVERSITY

7.1 INTRODUCTION

7.1.1 This chapter of the ES sets out the likely significant effects arising from the Proposed Development on biodiversity, together with any required strategies to minimise or compensate for those potential effects.

7.2 ASSESSMENT APPROACH

Methodology

7.2.1 The methodology utilised for the survey work can be split into three areas, namely desk study, habitat survey and faunal survey. These are discussed in more detail below.

Desk Study

7.2.2 In order to compile background information on the Application Site and the surrounding areas, Ecology Solutions contacted the Gloucestershire Centre for Environmental Records (GCER).

7.2.3 Further information on designated sites from a wider search area was obtained from the online Multi-Agency Geographic Information for the Countryside (MAGIC)[1] database (see **Figure 7.1** and **Appendix 7.1**).

Habitat Survey Methodology

7.2.4 The Application Site was subject to a high-level walkover and appraisal in March 2018, which was undertaken from public footpaths/rights of way and using aerial imagery and OS maps, as well as other desk-based information. Detailed habitat surveys were carried out between April and October 2019 to ascertain the general ecological value of the land contained within the boundaries of the Application Site and to identify the main habitats and associated plant species, with notes taken on fauna utilising the Application Site.

Extended Phase 1

7.2.5 The Application Site was surveyed over a number of visits between March 2018 and October 2019. The survey work was based around an extended Phase 1 Survey methodology[2] approved by Natural England, whereby the habitat types present are identified and mapped together with an assessment of the species composition of each habitat. This technique provides an inventory of the basic habitat types present and allows identification of areas of greater potential value, which require further survey. Any such areas identified can then be examined in more detail.

7.2.6 The habitats present within the Application Site were classified into areas of similar botanical community types with a representative sample of those species present at the time of the site survey being described where necessary.

7.2.7 A structured walk was also carried out across F2-F7 on 12th June 2019, with the walk following a 'W' formation across each field. Per field, a total of 10 stops each were

[1] http://www.magic.gov.uk

[2] Joint Nature Conservation Committee (1993) Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit. Peterborough. 1993.

carried out at regular intervals. At each stop, an area of $1m^2$ was surveyed and the plant species present were recorded. The frequency of occurrence ('rare', occasional' or 'frequent') of each species was then determined from the number of occasions it is recorded during the structured walk.

7.2.8 Detailed botanical surveys were carried out throughout 2019 to build up a species list across the year.

7.2.9 All of the species that occur in each habitat would not necessarily be detectable during survey work carried out at any given time of the year, since different species are apparent at different seasons. The habitat surveys were undertaken at different times of year and therefore included the optimal periods for habitat surveys. As such, it is considered an accurate and robust assessment has been made of the botanical interest.

Fauna

7.2.10 General faunal activity, such as birds or mammals observed visually or by call during the course of the surveys, was recorded. Specific attention was paid to any potential use of the Application Site and wider study area by protected species, Priority Species, or other notable species.

7.2.11 In addition, specific surveys were carried out between April and October 2019 for the presence of Badgers *Meles meles*, bats, breeding birds and reptiles.

7.2.12 Experienced ecologists undertook the faunal surveys with regard to established best practice and guidance issued by Natural England. Details of the methodologies employed are given below.

Badgers

7.2.13 Specific surveys for Badgers were carried out between April and October 2019 within the Application Site and wider study area.

7.2.14 The surveys comprised two main elements. Firstly, searching thoroughly for evidence of Badger setts. For any setts encountered each sett entrance was noted and plotted, even if the entrance appeared disused. The following information was recorded:

- The number and location of well used or very active entrances; these are clear of any debris or vegetation and are obviously in regular use and may, or may not, have been excavated recently
- The number and location of inactive entrances; these are not in regular use and have debris such as leaves and twigs in the entrance, or have plants growing in or around the edge of the entrance.
- The number of disused entrances; these have not been in use for some time, are partly or completely blocked and cannot be used without considerable clearance. If the entrance has been disused for some time all that may be visible is a depression in the ground where the hole used to be together with the remains of the spoil heap.

7.2.15 Secondly, evidence of Badger activity such as well-worn paths, run-throughs, snagged hair, footprints, latrines and foraging signs was recorded so as to build up a picture of the use of the Application Site by Badgers.

Bats

7.2.16 Field surveys were undertaken within the Application Site with regard to best practice guidelines issued by, the Joint Nature Conservation Committee (2004)[3] and the Bat Conservation Trust and (2016)[4].

Tree Assessment

7.2.17 All individual trees and standard hedgerows and trees within the Application Site were assessed for their potential to support roosting bats. Features typically favoured by bats were searched for, including:

- The Obvious holes, e.g. rot holes and old Woodpecker holes;
- Dark staining on the tree, below the hole;
- Tiny scratch marks around a hole from bat claws;
- Cavities, splits and or loose bark from broken or fallen branches, lightning strikes etc; and
- Very dense covering of mature Ivy *Hedera helix* over trunk.

Tree Climbing Inspections

7.2.18 On 24th June 2019 six mature trees (T1-T4, T13-T14, see **Figure 7.2**) that were identified to have the potential to support roosting bats and in early layout iterations could have been more isolated by the Proposed Development and not linked into wider green corridors were subject to an aerial tree climbing survey in which all features that could potentially support roosting bats were inspected closely using a torch and endoscope. This survey determined if roosting bats are present and if any features on the trees could potentially be utilised by roosting bats.

Tree Emergence Surveys

7.2.19 Due to safety reasons it was not possible to closely inspect all bat potential features (rot holes that are located on overhanging rotten branches) on two (T1 and T2, see **Figure 7.2**) of the six trees during the tree climbing inspections carried out in June. As such, surveyors undertook one evening emergence survey on 5th August 2019 of T1 and T2. A second evening emergence survey was undertaken of T1 on 2nd October 2019.

7.2.20 The evening emergence surveys commenced approximately quarter of an hour before sunset and extended up to two hours after sunset. The surveys involved surveyors watching potential entrance/exit points for bats (rot holes in overhanging branches) and were undertaken during suitable weather conditions. This survey method aimed to identify if any bats were roosting within the trees as well as the species and number of bats using any identified roosts.

Internal / External Building Assessment

7.2.21 The buildings within the Application Site were assessed for their potential to support roosting bats. In addition, the buildings were subject to internal and external surveys in May 2019 using ladders, torches, mirrors, binoculars and an endoscope where necessary.

[3] Mitchell-Jones, A.J. & McLeish, A.P. (Eds.) (2004). *Bat Workers' Manual*. 3rd edition. Joint Nature Conservation Committee, Peterborough.
[4] Bat Conservation Trust (2016). *Bat Surveys for Professional Ecologists – Good Practice Guidelines (3rd Edition)*. Bat Conservation Trust, London.

7.2.22 Evidence of the presence of bats was searched for, with particular attention paid to the roof areas and gaps between rafters and beams. Specific searches were made for bat droppings, which can indicate present or past use and extent of use, and other signs to indicate the possible presence of bats e.g. presence of stained areas, or areas that are conspicuously cobweb-free.

7.2.23 The probability of a building being used by bats as a summer roost site increases if it:

- is largely undisturbed;
- dates from pre-20th Century;
- has a large roof void with unobstructed flying spaces;
- has access points for bats (though not too draughty);
- has wooden cladding or hanging tiles; and/or
- is in a rural setting and close to woodland or water.

7.2.24 Conversely, the probability decreases if a building is of a modern or pre-fabricated design/construction, is in an urban setting, has small or cluttered roof voids, has few gaps at the eaves or is a heavily disturbed premises.

7.2.25 The main requirements for a winter/hibernation roost site are that it maintains a stable (cool) temperature and humidity. Sites commonly utilised by bats as winter roosts include cavities/holes in trees, underground sites and parts of buildings. Whilst different species may show a preference for one of these types of roost site, none are solely dependent on a single type.

Activity Surveys

7.2.26 Activity surveys were also carried out on seven separate evenings, with one survey each month between April and October 2019 across the Application Site. This survey method, aimed to identify the level of foraging, and the species present foraging and commuting within the Application Site. These evening activity surveys commenced at sunset and continued for 2-3 hours after sunset.

7.2.27 SongMeter Full Spectrum (SM4 FS) static bat detectors were left out at strategic positions (see **Figures 7.4-7.11**) for at least 5 consecutive nights each month between April and October 2019, in order to record bat activity overnight.

7.2.28 The emergence / re-entry surveys and activity surveys utilised Echo Meter Touch 2 Pro bat detectors to record the data. The data of all bat surveys were subsequently analysed using Kaleidoscope Pro bat sound analysis software.

Breeding Birds

7.2.29 Specific breeding bird surveys were carried out following the Common Bird Census (CBC) technique. The CBC involves walking transects routes through the area being studied and recording and plotting all bird species observed or heard and their behaviour.

7.2.30 The transect route is chosen so that the entire site is covered and all features likely to support breeding birds are surveyed. Routes and directions are varied between visits so that there is no tendency to visit a particular part of the plot later or earlier in the day.

7.2.31 Three surveys of the Application Site were conducted, on 26th April, 28th May and 20th June 2019 in order to assess breeding bird activity within the Application Site.

7.2.32 On each survey an experienced ornithologist walked a circuitous route that took in all parts of the Application Site, recording the locations, numbers and activity of all bird species present within (and around) the area during this time. Over the three visits, this methodology should ensure that the vast majority of species present at the Application Site are recorded. However, certain species that may be using the area as part of a larger territory, for example nocturnal species such as Owls, may be missed (especially in an area of this size), albeit Owls are often recorded during other surveys carried out, such as bat activity surveys.

7.2.33 To ascertain the breeding status of birds using the Application Site and wider study area, the following criteria were applied following the methodology used in the 'Atlas' surveys of 1988-1991 (Gibbons et al, 1993). This accepts the following activities as denoting breeding (including those probably breeding although definite proof was lacking):

- Bird apparently holding territory;
- Courtship and display;
- Nest-building (including excavating nest-hole);
- Distraction display or feigning injury;
- Adult carrying faecal sac or food;
- Adult entering or leaving apparently occupied nest site;
- Nest with eggs or eggshells found, or bird sitting but not disturbed;
- Nest with young; or downy young of ducks, gamebirds, waders and other nidifugous species;
- Recently fledged young.

7.2.34 In addition, observations were made as part of the various habitat surveys undertaken across the application site between 2018 and 2019.

Reptiles

7.2.35 Specific surveys for reptiles were carried out within the Application Site between July and September 2019. The methodology utilised principally derived from guidance given in the Herpetological Workers Manual.

7.2.36 Areas of suitable habitat were surveyed for the presence of reptiles using artificial refugia ("tins"). A total of 80 0.5m x 0.5m roofing felt tins were placed within areas of suitable reptile habitat in the Application Site.

7.2.37 The tins provide shelter and heat up quicker than the surroundings in the morning and can remain warmer than the surroundings in the late afternoon. Being ectothermic (cold blooded), reptiles use them to bask under and raise their body temperature which allows them to forage earlier and later in the day.

7.2.38 To determine presence/absence the tins are checked for reptile activity over seven visits at appropriate times of the day (avoiding the middle of the day when the ambient air temperature is at its highest) in accordance with Natural England guidance. Optimum weather conditions for reptile surveying are temperatures between 10°C and 17°C, intermittent or hazy sunshine and little or no wind.

Data sources

7.2.39 As stated above under 'Desk Study', the GCER was contacted, while further information on designated sites was obtained from the MAGIC database (see **Appendix 7.1**).

Assessment of Significance

7.2.40 The evaluation and assessment of significance has been undertaken with due regard to the guidelines produced by the Chartered Institute of Ecology and Environmental Management[5], which avoids the provision of definitions as to how to assign habitats and species different levels of value and relies on an approach that involves professional judgement and the use of available guidance and information.

7.2.41 The value of each resource is determined within a defined geographical context:

- International;
- UK;
- National (England/Northern Ireland/Scotland/Wales);
- Regional;
- County (or Metropolitan – e.g. in London);
- District (or Unitary Authority, City or Borough);
- Local or Parish; or
- Within Zone of Influence only

7.2.42 A number of other key considerations include:

- Designated Sites and Features (e.g. Special Protection Areas, Sites of Special Scientific Interest, important hedgerows etc.);
- Biodiversity Value (Use of Biodiversity Action Plans, development plans and other published documents);
- Potential Value;
- Secondary or Supporting Value;
- Social or Economic Value; and
- Legal Issues

7.2.43 For example, the Gloucestershire Local Nature Partnership (GLNP)[6] has been used to assist in valuing features and developing mitigation strategies, where necessary. Consideration has also been given to policies contained within the Local Planning Policy / Documents.

7.2.44 Having identified the ecologically important features likely to be affected by the Proposed Development, the current guidance promotes a transparent approach in which an effect is determined to be significant or not on the basis of a discussion of the factors that categorise it. This includes characterising the nature of the likely effects on each important feature in terms of ecological structure and function, by considering the following parameters:

- Positive or negative / beneficial or adverse;
- Extent;
- Magnitude;

[5]CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

[6] https://www.gloucestershirenature.org.uk/

- Duration;
- Reversibility; and
- Timing and frequency.

7.2.45 Where it is concluded that there would be an effect (positive or negative and including cumulative effects) on a defined site or ecosystem(s) and / or the conservation status of habitats or species within a given geographical area, it is described as significant in the following terms; major, moderate, minor, negligible and none.

Identifying the Zone of Influence

7.2.46 The potential ecological effects of the Proposed Development are largely confined to the Application Site itself but given the continuity of agricultural land outside the Application Site boundaries and proximity of waterbodies, consideration has also been given to the following likely significant effects, which may spread beyond the Application Site:

- Disturbance to populations within hearing range during the construction phase;
- Fragmentation of 'dispersal corridors' utilised by adjacent populations;
- Disruption to habitats / populations within receiving range of dust etc during the construction phase;
- Disturbance to habitats / populations within walking distance during the operation phase; and
- Pollution to watercourses during the construction and operation phases.

Legislative and Policy Framework

National Planning Policy Framework (February 2019)

7.2.47 Guidance on national policy for biodiversity and geological conservation is provided by the NPPF, published in March 2012, revised on 24 July 2018 and updated on 19 February 2019. It is noted that the NPPF continues to refer to further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system provided by Circular 06/05 (DEFRA / ODPM, 2005) accompanying the now-defunct Planning Policy Statement 9 (PPS9).

7.2.48 The key element of the NPPF is that there should be **"a presumption in favour of sustainable development"** (paragraphs 10 to 11). It is important to note that this presumption **"does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site"** (paragraph 177). 'Habitats site' has the same meaning as the term 'European site' as used in the Habitats Regulations 2017.

7.2.49 Hence the direction of Government policy is clear; that is, the presumption in favour of sustainable development is to apply in circumstances where there is potential for an effect on a European site, if it has been shown that there will be no adverse effect on that designated site as a result of the development in prospect.

7.2.50 A number of policies in the NPPF are comparable to those in PPS9, including reference to minimisation of effects to biodiversity and provision of net gains to biodiversity where possible (paragraph 170).

7.2.51 The NPPF also considers the strategic approach that Local Authorities should adopt with regard to the protection, maintenance and enhancement of green infrastructure, priority habitats and ecological networks, and the recovery of priority species.

7.2.52 Paragraphs 174 to 176 of the NPPF comprise a number of principles that Local Authorities should apply, including encouraging opportunities to incorporate biodiversity in and around developments; provision for refusal of planning applications if significant harm cannot be avoided, mitigated or compensated for; applying the protection given to European sites to potential SPAs, possible SACs, listed or proposed Ramsar sites and sites identified (or required) as compensatory measures for adverse effects on European sites; and the provision for the refusal for developments resulting in the loss or deterioration of 'irreplaceable' habitats – unless there are 'wholly exceptional reasons' (for instance, infrastructure projects where the public benefit would clearly outweigh the loss or deterioration of habitat) and a suitable compensation strategy exists.

7.2.53 National policy therefore implicitly recognises the importance of biodiversity and that with sensitive planning and design, development and conservation of the natural heritage can co-exist and benefits can, in certain circumstances, be obtained.

Local Plan

Gloucester, Cheltenham and Tewkesbury Joint Core Strategy

7.2.54 The Joint Core Strategy (JCS) is a partnership between Gloucester City Council, Cheltenham Borough Council and Tewkesbury Borough Council, supported by Gloucestershire County Council, and is an integral part of the Local Development Framework for the area. The JCS was formally was adopted in December 2017.

7.2.55 The JCS contains one policy of relevance to nature conservation (SD9), while Policies INF3 and INF6 relate to green infrastructure, open space. Policy **SD9** is concerned with the protection of internationally, nationally and locally designated sites, as well as protected species. Policy **INF3** is concerned with green infrastructure and green corridors (including hedgerows, woodland, and trees), while Policy **INF6** is concerned with the delivery of green infrastructure.

Cheltenham Borough Local Plan, Second Review (2006)

7.2.56 The Cheltenham Borough Local Plan, Second Review was adopted in 2006 and is the current document in use for planning control purposes. There are three policies within this document that relate in whole or in part to nature conservation (Policies NE1, NE2 and NE3) and four policies relevant to nature conservation / urban green environment (Policies GE 2, GE 5, GE 6 and GE 7). Policy **NE1** is concerned with protecting the habitat of any legally protected species, unless mitigation measures are put in place for the species protection. Policy **NE2** is concerned with the protection of nationally designated conservation sites, whilst Policy **NE3** is concerned with the protection of sites of local importance as well as the protection of areas significant to wildlife. Policy **GE 2** relates to the development of private green space, while Policy **GE 5** is concerned with the protection and replacement of trees. Policy **GE 6** is concerned with the protection of high value trees, while Policy **GE 7** is concerned with the protection of natural features.

Scoping Criteria

7.2.57 Consultation responses with reference to biodiversity were provided by Natural England (24th May 2019), Environment Agency (5th June 2019) and Cotswold

Conservation Board (6th June 2019). A scoping opinion was issued by Cheltenham Borough Council (12th July 2019) incorporating these responses.

7.2.58 Natural England's scoping response refers to the need and scope of an Ecological Impact Assessment (EclA), which considered internationally and nationally designated sites, regionally and locally important sites, protected species, as well as habitats and species of principal importance.

7.2.59 The Environment Agency's scoping response refers to potential pressure on existing habitats and the necessity to undertake a Phase 1 Habitat Survey, including the identification and evaluation of all habitats and populations of protected species within the Application Site. In addition, it acknowledges that the Proposed Development should restore and create habitat for the benefit of wildlife and that it should strive to provide biodiversity net-gain where possible.

7.2.60 The Cotswold Conservation Board's scoping response refers to the delivery of significant biodiversity net-gain within the Application Site.

7.2.61 The Cheltenham Borough Council's scoping response refers to the provision of green infrastructure and the importance of buffers generally throughout the Application Site.

7.2.62 This chapter has regard to the above matters raised in the scoping responses with regard to biodiversity.

Limitations to the Assessment

7.2.63 All habitat and protected species surveys were undertaken during suitable weather conditions, during the optimal survey periods, were completed across the year, and the methodologies had regard to national guidance and standing advice. Therefore, it is not considered that there are any significant limitations to this assessment.

7.3 BASELINE CONDITIONS

Introduction

7.3.1 The objectives of establishing the ecological baseline are twofold:

- to describe aspects of the natural environment and to identify important and protected habitats and species that could be adversely affected by the proposed development; and
- to characterise features that could be positively enhanced, created, restored or managed, by establishing the occurrence, distribution and extent of ecological features on site and in the surrounding area; and/or those species that could be positively managed to enhance their conservation status, distribution and abundance.

Site Description and Context

7.3.2 The Application Site is situated on the eastern side of Cheltenham, Gloucestershire and consists of six semi-improved grassland fields separated by hedgerows and trees. There are six buildings (B2-B7) in the north of the Application Site (building B1 was subsequently demolished in October 2019, local planning authority reference, 19/01610/DEMCON), with associated amenity planting, amenity and ruderal-dominated grassland, hedgerows and trees. The western boundary is bordered by a public footpath with existing residential development beyond. Residential development also lies to the north and south (beyond Harp Hill). New residential development is

currently in construction to the north-east and a covered reservoir is located to the east with open countryside beyond.

7.3.3 Natural and semi-natural habitats usually support the greatest diversity of wildlife. Important species are those protected by international or national legislation; those that have been identified in the 'UK Post-2010 Biodiversity Framework' as priority species, and those identified as locally distinctive in a local BAP, such as the Gloucestershire Local Nature Partnership (e.g. 'local keystone', 'flagship' and 'umbrella species').

7.3.4 National Character Areas are sub-divisions of England, each with a characteristic association of wildlife and natural features defined by Natural England. Each Natural Area has a unique identity resulting from the interaction of wildlife, landforms, geology, land use and human impact.

7.3.5 The Application Site is located within the Severn and Avon Vales.

7.3.6 This National Character is characterised by its low-lying open agricultural vale landscape with the Severn and Avon rivers threading through. The River Severn flows north to south between fairly high banks, while the river Avon meanders over a wide floodplain between Stratford, Evesham and Tewkesbury. Pasture and stock rearing are dominant on the floodplain and on steeper slopes, with poorer silty clay soil to the west of the Severn and heavy but productive soils to the east. Fragments of calcareous grassland and acidic grassland are present within the Severn and Avon Vales with areas of unimproved neutral grassland (lowland meadow priority meadow habitat) around Feckenham Forest and Malvern Chase. Woodland is sparsely distributed across this landscape, with frequent hedgerow trees, parkland and traditional orchards. There are a number of European protected sites including Special Protection Areas (SPA) and Special Areas of Conservation (SAC) Severn Estuary and Walmore Common, as well as the SACs Lyppard Grange Ponds, Bredon Hill and Dixton Wood.

Baseline Survey Information

Designated Sites

Statutory Sites

7.3.7 There are no statutory designated sites of nature conservation interest located within or immediately adjacent to the site.

7.3.8 The nearest statutory designated site is Cleeve Common Site of Special Scientific Interest (SSSI) that lies approximately 2.7km north-east of the Application Site and is designated, as it is one of the most extensive areas of limestone grassland in the Cotswolds. It is of importance both for its grassland, and for its geological and physiographical features. This statutory designated site is separated from the Application Site by residential development and extensive areas of open countryside and agricultural land.

7.3.9 In addition, there are three SSSI's located within 5km of the Application Site. Puckham Woods SSSI is located approximately 3.1km east of the Application Site and is designated for its '*Fraxinus excelsior - Acer campestre - Mercurialis perennis*' (W8) woodland and its calcareous grassland. Lineover Wood SSSI is located approximately 3.5km southeast of the Application Site and is also designated on the basis of being a '*Fraxinus excelsior - Acer campestre - Mercurialis perennis*' (W8) woodland. Leckhampton Hill and Charlton Kings Common SSSI is located approximately 3.5km south of the Application Site and is designated for its unimproved calcareous grassland, geological exposures, '*Ulex europaeus - Rubus fruticosus* scrub' (W23) woodland and for

a population of Duke of Burgundy *Hamearis Lucina*, a nationally scarce butterfly. These SSSIs are well separated from the Application Site by residential development, major roads and extensive areas of open countryside and agricultural land.

7.3.10 The nearest European designation is Dixton Wood Special Area of Conservation (SAC), also notified as a SSSI, that lies around 8.6km to the north of the Application Site. This SAC/SSSI is one of only three known locations in the UK for the Violet Click Beetle (*Limoniscus violaceus*) and is an area of broad-leaved woodland surrounded by permanent pasture.

7.3.11 Cotswold Beechwoods SAC (also designated as Cotswold Commons and Beechwoods National Nature Reserve [NNR] and SSSI) lies a similar distance (8.7km) to the south-west of the Application Site. This SAC qualifies for the presence of the Annex I habitat *Asperulo-Fagetum* beech forest, being the most westerly extensive block of this habitat in the UK. The woodland is identified as supporting a number of rare plants and includes the Annex I habitat 'Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*)' present as a qualifying feature, but not a primary reason for selection. Lesser Horseshoe *Rhinolophus hipposideros* and Greater Horseshoe *Rhinolophus ferrumequinum* bats are also present within this SAC. The Cotswold Commons and Beechwoods SSSI and NNR are also designated for the presence of ancient Beech woodland and unimproved grassland, with the woodlands being among the most species-rich and diverse of their habitat type.

Non-statutory sites

7.3.12 There are no non-statutory designated sites of nature conservation interest located within or immediately adjacent to the site.

7.3.13 The nearest non-statutory site is Glenfall Wood Key Wildlife Site (KWS) located approximately 0.8km southeast of the Application Site and is designated for its ancient and semi-natural broad-leaved Ash *Fraxinus excelsior* Ash - Wych Elm *Ulmus glabra* woodland and diverse ground flora including Wood-sorrel *Oxalis acetosella* and Sanicle *Sanicula europaea*. This KWS is separated from the Application Site by roads and agricultural land.

Habitats

7.3.14 The following main habitat / vegetation types were identified within the Application Site and wider study area (see **Figure 7.2**):

- Amenity Grassland and Amenity Planting;
- Semi-Improved Grassland;
- Hedgerows and Trees;
- Dry Depression, Ruderal Vegetation and Ruderal-dominated Grassland;
- Scattered Scrub, Bramble Scrub and Cleared Bramble Scrub;
- Buildings and Hardstanding; and
- Cleared Ground.

Amenity Grassland and Amenity Planting

7.3.15 Field **F1** comprises a former garden with four fruit trees. This amenity grassland field is bounded by remnants of cleared Bramble scrub. Species present within the sward include Sweet Vernal Grass *Anthoxanthum odoratum*, Meadow Foxtail *Alopecurus pratensis*, Crested Dogs'-tail *Cynosurus cristatus*, Cock's-foot *Dactylis glomerata*, False Oat Grass *Arrhenatherum elatius* and Pendulous Sedge *Carex pendula*. Herbaceous species include Ribwort Plantain *Plantago lanceolata*, Cuckooflower

Cardamine pratensis, Cowslip *Primula veris*, Bugle *Ajuga reptans*, Creeping Buttercup *Ranunculus repens*, Spear Thistle *Cirsium vulgare*, White Clover *Trifolium repens*, Red Clover *Trifolium pratense*, Lords and Ladies *Arum maculatum*, Smooth Tare *Vicia tetrasperma*, Common Vetch *Vicia sativa*, Lesser Celandine *Ficaria verna*, Meadow Vetchling *Lathyrus pratensis*, Germander Speedwell *Veronica chamaedrys*, Common Speedwell *Veronica persica*, Ground Ivy *Glechoma hederacea*, Broadleaved Dock *Rumex obtusifolius*, Dandelion *Taraxacum officinale* and Blackthorn *Prunus spinosa* saplings.

7.3.16 There is an area of neglected amenity planting around the demolished house B1 within F1. Species within this area include Wood Avens *Geum urbanum*, Cleavers *Galium aparine*, Bramble, Toadflax *Linaria vulgaris*, Hellebore *Helleborus* sp., *Cotoneaster* sp., Sea Holly *Eryngium maritimum*, Apple Mint *Mentha suaveolens*, *Campanula* sp., Boston Ivy *Parthenocissus tricuspidata* (invasive climber), Creeping Jenny *Lysimachia nummularia*, Bleeding Heart *Lamprocapnos spectabilis*, Montbretia *Crocosmia* × *crocosmiiflora*, Forsythia *Forsythia europaea*, *Rose* sp., Hop *Humulus lupulus*, Jasmine *Jasminum* sp., Virginia Creeper *Parthenocissus quinquefolia*, Hydrangea *Hydrangea macrophylla*, Common Spotted Orchid *Dactylorhiza fuchsii*, Bluebell *Hyacinthoides non-scripta* and Lavender *Lavandula angustifolia.* Much of the planting around the house was removed during demolition of B1 under planning consent 19/01610/DEMCON.

7.3.17 There is a strip of unmanaged amenity grassland and planting along either side of the track leading from Priors Road up to the northwestern corner of the main Application Site. The southern side of the track is bounded with residential fencing and the northern side is also bounded by fencing. Species present include Bramble, Ash, Field Maple *Acer campestre*, *Rosa* sp., Hawthorn *Crataegus monogyna*, Ash and Oak *Quercus* sp.saplings, with Ivy and Hedge Bindweed *Calystegia sepium* trailing through. Species within the ground flora include Perennial Ryegrass *Lolium perenne*, Meadow Foxtail Cock's Foot, Creeping Cinquefoil *Potentilla reptans*, Ribwort Plantain, Red Clover, Dandelion, Cleavers, Common Nettle and Common Sorrel *Rumex acetosa*.

Semi-improved Grassland

7.3.18 There are six semi-improved grassland fields within the Application Site (F2-F7), all of which were subject to detailed botanical surveys throughout 2019. All fields are subject to an early hay cut, however, in order to facilitate surveys within the Application site in 2019, the hay cut was delayed until late September 2019.

7.3.19 Field **F2** is bounded by hedgerows to the south, east and west and borders F1 to the north. Species present within the sward include frequently found Cock's-Foot, Sweet Vernal Grass, Yorkshire Fog *Holcus lanatus*, Red Fescue *Festuca rubra*, Perennial Rye, Crested Dogs tail and Soft Brome *Bromus hordeaceus*, with occasionally found Creeping Bent *Agrostis stolonifera*, False Oat and Meadow Foxtail and rarely found Soft Rush *Juncus effusus*, Field Wood-rush *Luzula campestris* and Meadow Barley *Hordeum brachyantherum.* Herbaceous species include frequently found Smooth Tare, Common Sorrel and Bird's-foot-trefoil *Lotus corniculatus,* with occasionally found Meadow Vetchling, Dandelion, Ribwort Plantain, Hogweed *Heracleum sphondylium* and Creeping Buttercup *Ranunculus repens*, and rarely found Meadow Buttercup *Ranunculus acris*, Black Knapweed *Centaurea nigra*, Broad-leaved Dock *Rumex obtusifolius*, Pignut *Conopodium majus*, Hedge Woundwort *Stachys sylvatica*, Cuckooflower, Lesser Celandine, Cowslip (a very small number of individual plants), Common Mouse-ear *Cerastium fontanum*, Yarrow *Achillea millefolium*, Lords and Ladies, Common Nettle, Cleavers and Blackthorn saplings. The eastern area and a small strip along the southern boundary of the field is generally more species diverse comprising an area of greater botanical interest (see **Figure 7.2**).

7.3.20 Field **F3** covers the western part of the Application Site and is bounded by hedgerows on all sides. There is a mature Oak tree in the central-west part of the field. Species present within the sward include frequently found Cock's Foot, Sweet Vernal Grass, Meadow Foxtail, Perennial Rye and Yorkshire Fog, with occasionally found Soft Brome, Creeping Bent, Crested Dogs Tail, Red Fescue and False Oat Grass and rarely found Meadow Barley, Rough Meadow Grass *Poa trivialis* and Field Wood-rush. Herbaceous species present include frequently found Bird's-foot-trefoil, Meadow Buttercup, Creeping Buttercup, Common Sorrel, Meadow Vetchling, Dandelion and Hogweed, with occasionally found Pignut and Black Knapweed and rarely found Smooth Tare, Broad-leaved Dock, Common Mouse-ear, Ladies Bedstraw *Galium verum*, Creeping Cinquefoil, Betony *Stachys officinalis*, Common Vetch, Ribwort Plantain, Dove's-foot Cranesbill *Geranium molle*, Bluebell, Lesser Stitchwort *Stellaria graminea* and Lesser Celandine. The western area of F3 is generally more species diverse than the east (see **Figure 7.2**).

7.3.21 Field **F4** is bordered to the south, west and east by hedgerows and to the north by a wire mesh fence. The grasses dominate the field with the herbaceous content much lower than F2 and F3. Species present within the sward include frequently found Yorkshire Fog, Cock's Foot, Red Fescue, Meadow Foxtail and Sweet Vernal Grass, with occasionally found Soft Brome, Creeping Bent and False Oat Grass and rarely found Crested Dog's Tail, Meadow Barley and Perennial Ryegrass. Herbaceous species include frequently found Meadow Buttercup and Common Sorrel, with occasionally found Red Clover, Creeping Buttercup, Smooth Tare, Dandelion, Meadow Vetchling, Pignut, Dove's-foot Cranesbill and Broadleaved Dock and rarely found Ribwort Plantain, White Clover, Bird's-foot-trefoil, Black Knapweed, Grass Vetchling *Lathyrus nissolia* and Common Vetch. In addition, there is a patch of ruderal vegetation in the northwestern corner of the field comprising predominantly Common Nettle and Broad-leaved Dock.

7.3.22 Field **F5** is located in the northeastern corner of the Application Site and is bordered to the south and west by hedgerows and north and east by a closed-board fence. The grasses dominate the field with the herbaceous content much lower than F2 and F3. Species present within the sward include frequently found Yorkshire Fog, Meadow Foxtail, Perennial Ryegrass, Sweet Vernal Grass and Red Fescue, with occasionally found Cock's Foot, Creeping Bent and Crested Dogs Tail, and rarely found Meadow Barley, Smooth Meadow Grass *Poa pratensis*, False Oat and Soft Brome. Herbaceous species include frequently found Meadow Buttercup, occasionally found Dandelion, Common Vetch, Creeping Buttercup and Bird's-foot-trefoil, and rarely found Smooth Tare, Bush Vetch *Vicia sepium*, Ribwort Plantain , Hairy Tare *Vicia hirsuta*, Yellow Rattle *Rhinanthus minor* and Common Sorrel.

7.3.23 Field **F6** lies in the southeastern area of the Application site and is bordered to the north, south and west by hedgerows, to the northeast by closed-boarded fence and to the southeast by a wall with a covered reservoir beyond. The grasses dominate the field with the herbaceous content much lower than F2 and F3. Species present within the sward include frequently found Cock's Foot, Soft Brome, Red Fescue, Sweet Vernal Grass, Creeping Bent, Yorkshire Fog, with occasionally found Meadow Barley, Meadow Foxtail and Perennial Ryegrass, and rarely found Smooth Meadow Grass, False Oat Grass and Crested Dog's Tail. Herbaceous species within the field include frequently found Ribwort Plantain and Bird's-foot-trefoil, with occasionally found Hogweed, Pignut and Common Sorrel, and rarely found Dandelion, Smooth Tare, Meadow Buttercup, Common Vetch, Dove's-foot Cranesbill, Meadow Vetchling, Black Knapweed and Trailing Tormentil *Potentilla anglica*.

7.3.24 Field **F7** is a triangular field bordered by hedgerows to the south and west. A depression (dry throughout the surveys conducted) runs from the southeastern corner of the field to the northwestern corner of the field. The field consists mainly of cleared Bramble scrub (and thus bare ground). Species present within the sward outside the

cleared area include frequently found Cock's Foot, Meadow Foxtail and Yorkshire Fog, with occasionally found Creeping Bent and Tufted Hairgrass *Deschampsia cespitosa*, and rarely found Meadow Foxtail, Sweet Vernal Grass and Red Fescue. Herbaceous species include frequently found Cleavers, with occasionally found Bramble saplings, Oak saplings, Common Nettle and Pignut, and rarely found Bugle, Common Sorrel, Tormentil *Potentilla erecta*, Creeping Thistle *Cirsium arvense*, Meadow Buttercup, Male Fern *Dryopteris filix-mas* and Broadleaved Dock.

Summary. The southeastern area and a small strip along the southern boundary of F2 as well as the western part of F3 appear to be more species diverse comprising areas of greater botanical interest (see **Figure 7.2**). These areas include indicator species for Priority Habitat Lowland Meadow (G06) such as Betony, Bird's-foot-trefoil, Black Knapweed, Cowslip, Ladies Bedstraw, Meadow Vetchling and Pignut. Although some of the indicator species (Bird's-foot-trefoil, Black Knapweed, Bugle, Meadow Vetchling, Pignut, Tormentil and Yellow Rattle) were also recorded in fields F4-F7, these were recorded at much lower frequencies and likely to be remnants following agricultural improvements. As such it is not considered that these fields are of particular existing botanical interest.

Hedgerows and Trees

7.3.25 There are 13 hedgerows within the Application Site (see **Figure 7.2**), each of which are described individually below. Of these hedgerows, six are considered likely to qualify as important, comprising seven or more native woody species (H1, H2, H6, H9, H10, H12), as specified in Schedule 1, Part II Criteria, paragraph 7(1) of the Hedgerow Regulations (1997). Five hedgerows are considered to be species-rich, comprising five or more native woody species (H3, H5, H7, H11, H13).

7.3.26 **H1** is approximately 3m in height and approximately 2m wide in the north and widening out to the south of the Application Site. Some trees within the hedgerow seem to have been removed leaving the hedgerow very gappy. Species present within this hedgerow include Blackthorn, Hawthorn, Bramble, Dogwood *Cornus sanguinea*, semi-mature Oak, Hazel *Corylus avellana*, Sycamore *Acer pseudoplatanus*, Holly, Field Maple, Ash, Weeping Willow *Salix babylonica*, Elm and Garden Privet *Ligustrum ovalifolium*, with Ivy and Dog Rose *Rosa canina*. Species present within the ground flora include Hedge Woundwort, Cleavers, Lesser Celandine, Common Nettle, Herb Robert *Geranium robertianum*, Daffodils *Narcissus pseudonarcissus*, Garlic Mustard *Alliaria petiolata* and Lords and Ladies. Based on the number of woody species, this hedgerow is likely to qualify as important under the hedgerow regulations.

7.3.27 **H2** is approximately 4m in height and approximately 2m wide and borders the southwestern boundary of the Application Site. The roadside of the hedgerow (southern aspect) is cut back, while the field side of the hedgerow (northern aspect) is unmanaged. There is wood-post and wire fencing along the northern aspect of the hedge (within F3). Species present within this hedgerow include Blackthorn, Hawthorn, Elm, Ash, *Rose* sp., Sycamore, Field Maple, Oak and Hazel, with Ivy trailing through. Species present within the ground flora include Common Couch Grass *Elymus repens*, Lords and Ladies, Bracken *Pteridium aquilinum*, Cleavers, Dog's Mercury *Mercurialis perennis*, Dandelion and Hedge Woundwort. Based on the species composition, this hedgerow is likely to qualify as important under the hedgerow regulations.

7.3.28 **H2a** is unmanaged and borders the western boundary of the Application Site. Technically, given the lack of other hedgerow connections this hedge would be deemed a continuation of H2. However, it is described separately given its different composition and structure. There are two gaps along the southern section of the hedgerow with post and wire fencing along the western side of the hedgerow. The hedgerow is approximately 2m in height, between 1-2m wide and is dominated by Bramble, with

Sycamore, Blackthorn, Ash and Elm. Species present within the ground flora include Cleavers, Bush Vetch and Lesser Celandine.

7.3.29 **H3** is species rich, approximately 4m in height and 1-2m in width and borders the northwestern boundary of the Application Site. The hedge is box cut on the side facing the access track (northern aspect) and unmanaged on the field side (southern aspect). This hedgerow is dominated by Blackthorn, with Ash, Elm, Hawthorn and Field Maple also present, with Bramble trailing through. There are Blackthorn saplings encroaching into the grassland field.

7.3.30 **H4** is unmanaged, approximately 3-4m in height, 1-2m wide and borders F1 to the north. There is evidence of a wooden fence. Species present within this hedgerow include Garden Privet, Oak, Ash, Lyland Cypress *Cupressus* × *leylandii*, Common Barberry *Berberis vulgaris*, Crack Willow *Salix fragilis* and Hawthorn, with Honeysuckle *Lonicera periclymenum* and Ivy trailing through. Species present in the ground flora include Broadleaved Dock.

7.3.31 **H5** is species rich, approximately 3-4m in height and 1-2m wide. The hedge is unmanaged and gappy with evidence of a wood-post and wire fence. Species present include Bramble, Blackthorn, Hawthorn, Ash, Oak, Elder *Sambucus nigra*, Holly and *Prunus* sp., with Ivy trailing through the Ash trees. Species present in the ground flora include Cleavers, Common Nettle, Broadleaved Dock and Cow Parsley *Anthriscus sylvestris*.

7.3.32 **H6** is an unmanaged gappy and leggy hedge, with evidence of a wood-post and wire fence. The hedge is generally gappy, approximately 2-3m in height and 2m wide. Species present within this hedgerow include Elder, Hawthorn, *Rosa* sp., Hornbeam *Carpinus betulus*, Bramble, Blackthorn, Hazel, Ash, *Cotoneaster* sp., Yew *Taxus baccata* and Oak. Species present in the ground flora include Cleavers, Common Nettle, Bluebell and Broadleaved Dock. Based on the number of woody species, this hedgerow is likely to qualify as important under the hedgerow regulations. Although its value is tempered by the presence the of non-native *Cotoneaster* sp.

7.3.33 **H7** is unmanaged and borders F5 to the south and F6 to the northeast. The hedge is approximately 2-3m in height and 3m wide, with a small gap present in the northern section of the hedge. This hedgerow is gappy and dominated by a thick Bramble scrub merging into a hedge with a slight ditch on the south side. Species present within this hedgerow include Blackthorn, *Rosa* sp., Ash, Oak, Holly and Hawthorn. Species present within the ground flora include Greater Stitchwort *Stellaria holostea*, Cleavers, Bluebell, Common Nettle and Broadleaved Dock.

7.3.34 **H8** is unmanaged with a ditch running along the centre of the hedgerow and evidence of some scrub clearance on either side. This hedgerow is gappy, approximately 2-3m in height, 2m wide and borders F4 to the south and F6 to the northwest. Species present within this hedgerow include Oak, Holly Blackthorn and Hazel. Species present within the ground flora include Bluebell and Broadleaved Dock.

7.3.35 **H9** borders F2 to the east and F6 to the west. The hedge is unmanaged, approximately 3m in height, 2m wide with a small gap in the northern section of the hedge. Species present within this hedgerow include Field Maple, Hawthorn, Oak, *Rosa* sp., Blackthorn, Elder, Sycamore and Holly, with rarely trailing through Ivy. Species present within the ground flora include Common Nettle, Broadleaved Dock, Garlic Mustard and Lords and Ladies. Based on the number of woody species, this hedgerow is likely to qualify as important under the hedgerow regulations.

7.3.36 **H10** is approximately 2m in height and borders the southeastern boundary of the Application Site. The roadside of the hedgerow (southern aspect) is cut back, while

the field side of the hedgerow (northern aspect) is unmanaged. Species present within this hedgerow include Hazel, Blackthorn, Ash, Hawthorn, Elm, *Rosa* sp., Field Maple and Bramble, with Common Nettle, Cleavers and Broadleaved Dock present in the ground flora. Based on the number of woody species, this hedgerow is likely to qualify as important under the hedgerow regulations.

7.3.37 **H11** is approximately 2m in height and borders the southern boundary of the Application Site. The roadside of the hedgerow (southern aspect) is cut back, while the field side of the hedgerow (northern aspect) is unmanaged. Species present within this hedgerow include Hawthorn, Ash, Blackthorn, Dogwood, Hazel, Field Maple, Oak, *Rosa* sp., Dogwood, Hornbeam, Holly, *Cotoneaster* sp. and Sycamore, with Ivy trailing through. Species present within the ground flora include Cleavers, Common Nettle, Herb Robert and Broadleaved Dock. Based on the number of woody species, this hedgerow is likely to be classified as species rich. Although its value is tempered by the presence of the non-native Cotoneaster.

7.3.38 **H12** is unmanaged and borders F2 to the northeast and F7 to the south, with a shallow ditch running through. Species present within this hedgerow include Ash, Elder, Holly, *Rose* sp., Oak, Blackthorn and Hawthorn. Species present within the ground flora include Broadleaved Dock, Lords and Ladies, Common Nettle and Cleavers. Based on the species composition, this hedgerow is likely to qualify as important under the hedgerow regulations.

7.3.39 **H12a** borders F2 to the northeast and F7 to the west. Technically, given the lack of other hedgerow connections this hedge would be deemed a continuation of H12. However, it is described separately given its different composition and structure. The hedge is unmanaged, approximately 3-4m in height and 2m wide. Species present within this hedgerow include Hawthorn, Bramble and Holly, with Dog's Mercury present within the ground flora.

7.3.40 **H13** encompasses native species, shrubby amenity vegetation and tall trees (and is likely to be classified as a tree belt as opposed a hedgerow). Species present include, Cherry Laurel *Prunus laurocerasus*, Hazel, Elder, Blackthorn, Field Maple and Willow *Salix* sp., with Bramble and Ivy trailing through. Species within the ground flora include Broadleaved Dock, Common Nettle, Dandelion, Cleavers, Bugle and Lesser Celandine. Given the species composition (containing more than five woody species), this feature is classified as species-rich (albeit tempered by amenity and non-native species). To the west the hedgerow is dominated by Bramble which is approximately 1m in height.

Dry Depression, Ruderal Vegetation and Ruderal-dominated Grassland

7.3.41 There is a slight depression running from the northern end of H9 to the northern end of H12a. Species within this depression include Cock's Foot, Meadow Foxtail, Soft Rush , Tormentil, Pignut, Agrimony *Agrimonia eupatoria*, Cleavers, Common Nettle, Bush Vetch, Cut leaved Cranesbill *Geranium dissectum*, Common Sorrel and Creeping Thistle. There is a small area of ruderal vegetation dominated by Common Nettle north of the depression.

7.3.42 There are other areas of ruderal vegetation associated with the buildings. Also, there is a patch of ruderal vegetation within the northwestern corner of F4. Species present within the ruderal vegetation are dominated by Common Nettle, with Broad-leaved Dock and Cleavers also present.

7.3.43 There are areas of ruderal-dominated grassland associated with the buildings and hardstanding in the north of the Application Site. Species within these areas include

Cock's Foot, Silverweed *Argentina anserina*, Common Nettle, Bramble, Dandelion, Ribwort Plantain, Creeping Buttercup, Garlic Mustard and Broadleaved Dock.

Scattered Scrub, Bramble Scrub and Cleared Bramble Scrub

7.3.44 There are areas of scattered scrub present along the northeastern boundary of the Application Site within F5, along the western boundary within F6 and within the depression bordering F4 and F7.

7.3.45 There are areas of Bramble scrub present in the southwestern corner of the Application Site, along the southern part of H1, in the northwestern and southeastern corner of F5 and south of B3.

7.3.46 In addition, there are areas of cleared Bramble scrub within F7, at the junction of H9 and H12 within F2 and in the southeastern corner of the Application site.

Buildings and Hardstanding

7.3.47 There are six abandoned farm buildings (B2-B7) present in the northern area of the Application Site, each of which are described below (building B1, a two-story farmhouse building with a pitched roof, was subsequently demolished in October 2019, local planning authority reference, 19/01610/DEMCON, after evening emergence and dawn re-entry surveys undertaken in June, July and September 2019 confirmed no bat roosts were present).

7.3.48 **B2** is a large barn with a pitched corrugated metal roof fastened directly onto metal beams. The barn is an open structure with the eastern and western sides partially closed off with corrugated metal, brick and wooden slats with gaps in between.

7.3.49 **B3** is an open shed with a sloping corrugated metal roof and brick walls with small open windows directly underneath the roof, while **B4** is an open timber shed with a sloping corrugated metal roof and corrugated metal walls.

7.3.50 **B5** consists of two conjoined wooden structures with sloping corrugated roofs fastened directly onto wooden beams. The eastern structure is open to the west (facing the western structure), with a corrugated metal wall to the east and wooded slats to the north and south, whereas the western structure is open to the east (facing the eastern structure), with a corrugated metal wall to the west and wooded slats to the north and south.

7.3.51 **B6** is a small brick structure with a sloping corrugated roof and Ivy growing along the walls up to the roof.

7.3.52 **B7** is an open and exposed single-story building encompassing four conjoined structures. The northernmost structure has a sloping corrugated metal roof, as well as a pitched roof with s-shaped clay tiles and brick walls with open windows to the east and west. The two structures in the middle have a pitched roof with either slates or corrugated metal fastened directly onto wooden beams and part brick and part wooden slat walls with open windows to the east and west. The southernmost structure is a rounded structure with rounded corrugated metal stretching from one side of the building to the other (east to west), an open door and open windows to the east and west and a brick wall to the south.

7.3.53 In addition, there are small areas of hardstanding present within the Application Site, associated with the buildings.

Cleared Ground

7.3.54 There is an area of cleared ground in the north of the Application Site. In this area a two-story farmhouse building B1, was demolished (under planning consent 19/01610/DEMCON) in October 2019 after evening emergence and dawn re-entry surveys for roosting bats, undertaken in June, July and September 2019, confirmed no bat roosts were present.

7.3.55 **Background Records**. The GCER returned no records of any notable plants from within the Application Site itself. A single record of Bluebell *Hyacinthoides non-scripta,* a Schedule 8 species (protected from sale only), was returned from approximately 0.3km south of the Application Site in 2000. This species was recorded within the Application Site (see previous).

7.3.56 The analysis of the online database MAGIC shows that the southeastern part of F4 and southern part of F7 are identified as deciduous woodland priority habitat (see **Appendix 7.1**). This identification was undertaken during the 2014 National Forest Inventory. However, such candidate priority habitat listing has not necessarily been confirmed on the ground and the confidence in this categorisation is listed as being 'low'. Indeed, during the surveys conducted between March 2018 and October 2019 this area was not confirmed as woodland but instead a number of different habitats including areas of semi-improved grassland, an area of cleared Bramble scrub, an area of the dry depression and scattered scrub and a small number of scattered trees (see **Figure 7.2**). As such, given the nature of that this area, it is considered that it should not be categorised as deciduous woodland priority habitat.

Wildlife Use of the Application Site

Badger

7.3.57 Evidence of mammal pathways and push-throughs were recorded throughout the Application Site, however, no specific evidence of Badgers was recorded associated with these pathways during any of the surveys undertaken and no setts were recorded within the Application Site itself. Deer are known to utilise the Application Site and some of the pathways are undoubtedly attributable to this group, but it is possible that there is some use by Badgers.

7.3.58 **Background Records**. The GCER returned no records of Badger from within the Application Site itself. The nearest record was returned from approximately 0.1km south of the Application Site in 2016. Although, Badgers are also known to be present in the cemetery off-site to the north.

Bats

Tree Surveys

7.3.59 A total of 14 semi-mature / mature trees, the majority of which are oak and Ash trees, within the Application Site were recorded as having developed features such as holes, cracks and splits that offer potentially suitable features for roosting bats (see **Figure 7.3**).

7.3.60 A total of six (T1-T3, T13, T14) of the 14 trees with features potentially supporting roosting bats were subject to an aerial tree climbing survey on 24th June 2019. No evidence of roosting bats was recorded within any of the closely inspected features within T3, T13 and T14, the majority of which were recorded as being either shallow, damp or full of insects.

7.3.61 Due to safety reasons some features on two mature Oak trees (T1 and T2) could not be inspected during the aerial tree climbing inspections. As such, surveyors undertook evening emergence surveys of these trees.

7.3.62 During the evening emergence survey carried out on 5th August 2019, a single Noctule *Nyctalus noctula* was recorded emerging from one of the features in T1 (see **Figure 7.3**). No bat was recorded emerging from the feature observed in T2.

7.3.63 During the evening emergence survey carried out on 2nd October 2019, no bats were seen emerge from the feature observed in T1.

7.3.64 In addition, two bird boxes were noted on an Ash tree within field F1, north of the now demolished building B1. No roosting activity was recorded associated with these bird boxes during any of the surveys undertaken.

Internal / External Building Survey Results

7.3.65 During internal and external surveys no evidence of bat was recorded within the former farmhouse B1. Results of internal / external surveys and emergence / re-entry surveys undertaken by Ecology Solutions were submitted in a 'Briefing Note – Bat Survey' in September 2019. The building has since been demolished under planning consent 19/01610/DEMCON.

7.3.66 Buildings B2-B7 are not considered to offer suitable potential for roosting bats and no evidence of bats was recorded during the internal / external inspections of these buildings.

Activity surveys

7.3.67 Evening activity surveys were carried out across the Application Site in each month between April and October 2019. The results of these surveys are discussed in full below. The weather conditions for these surveys can be seen at **Appendix 7.2**.

7.3.68 **April.** During the activity survey carried out on 24th April 2019, low levels of bat activity were recorded within the Application Site. The majority of registrations were recorded from Common Pipistrelle *Pipistrellus pipistrellus* (a total of 70 registrations), with much lower levels of activity recorded from Soprano Pipistrelle *Pipistrellus pygmaeus* (a total of 4 registrations), and with only occasional registrations recorded from *Myotis* sp. (a total of two registrations) and a single registration from *Nyctalus* sp.

7.3.69 The majority of this activity was recorded along H9 and H12a, with smaller numbers of registrations also and along H1, H2a, H3, H7 and H11 (see **Figure 7.4)**.

7.3.70 **May.** During the survey carried out on 22nd May 2019, low levels of bat activity were recorded within the Application Site. The vast majority of activity recorded was again from Common Pipistrelle bats (a total of 100 registrations), with only occasional registrations recorded from *Myotis* sp. (a total of five registrations), *Nyctalus* sp. (a total of four registrations), Soprano Pipistrelle (a total of two registrations) and Nathusius' Pipistrelle *Pipistrellus nathusii* (a total of two registrations).

7.3.71 The majority of activity recorded during this survey was generally associated with the hedgerows and trees in southwestern corner of the Application site (at the junction of H2 and H2a), with occasional activity along H7, H8 and H12a. A few registrations were also recorded along H12a. Smaller numbers of registrations were recorded along H1, H3, H4, H5 and H11 (see **Figure 7.5**).

7.3.72 **June.** During the survey carried out on 13th June 2019, low levels of bat activity were recorded within the Application Site. The vast majority of activity recorded was again from Common Pipistrelle bats (a total of 80 registrations), with lower levels of activity recorded from Soprano Pipistrelle (a total of 10 registrations), and with only occasional registrations from *Nyctalus* sp. (a total of three registrations) and a single registrations recorded from *Myotis* sp., Nathusius' Pipistrelle and Lesser Horseshoe.

7.3.73 The majority of bat activity was recorded at the northern end of H1 southwest of (the now demolished building) B1, as well as in the northwestern corner of F4. Smaller numbers of registrations were also recorded along hedgerows H2a, H7, H8, H9, H10, H11, H12, H12a and the eastern boundary of the Application Site (see **Figure 7.6**).

7.3.74 **July.** During the survey carried out on 10th July 2019, low to moderate levels of bat activity were recorded within the Application Site. The vast majority of activity recorded was again from Common Pipistrelle bats (a total of 110 registrations), with much lower levels of activity recorded from *Nyctalus* sp. (a total of five registrations), *Myotis* sp. (a total of six registrations) and Lesser Horseshoe bats (a total of six registrations), and with only occasional registrations recorded from Soprano Pipistrelle (a total of two registrations), Nathusius' Pipistrelle (a total of two registrations), and a single registration recorded from Brown Long-eared bat *Plecotus auritus*.

7.3.75 The majority of bat activity was associated with the northern end of H1 west of (the now demolished building) B1, H11, the northern end of H12a (south of B3 and B7), as well as east of B7. Smaller numbers of registrations were also recorded along most other site hedgerows with the exception of H10 and H13 (see **Figure 7.7**).

7.3.76 **August.** During the survey carried out on 12th August 2019, low to moderate levels of bat activity were recorded within the Application Site. The vast majority of activity recorded was from Common Pipistrelle bats (a total of 153 registrations), with much lower levels of activity recorded from *Myotis* sp. (a total of seven registrations), *Nyctalus* sp. (a total of three registrations), and a single registration recorded from Brown Long-eared bat.

7.3.77 The majority of the bat activity recorded was associated with hedgerows H7, H8 and H9, with activity also recorded north of the dry depression and along most other site hedgerows with the exception of H5, H12, H12a and H13 (see **Figure 7.8**).

7.3.78 **September.** During the survey carried out on 10th September 2019, only very low numbers of registrations were recorded within the Application Site. The majority of activity recorded was again from Common Pipistrelle bats (a total of 9 registrations), with occasional registrations recorded from Brown Long-eared bat (a total of two registrations) and a single registration recorded from Soprano Pipistrelle.

7.3.79 The majority of the bat activity recorded was associated with the dry depression within F4 and along H8, with a single registration of Soprano Pipistrelle recorded north of B2 and a single registration of Common Pipistrelle recorded in the northwestern corner of F4 (see **Figure 7.9**).

7.3.80 **October.** During the survey carried out on 22nd October 2019, only very low numbers of bat registrations were recorded within the Application Site. The vast majority of activity recorded was from Common Pipistrelle (a total of 58 registrations), with occasional registrations recorded from Soprano Pipistrelle (a total of six registrations), *Myotis* sp. (a total of four registrations) and single registrations recorded from each Serotine *Eptesicus serotinus*, *Nyctalus* sp., Brown Long-eared bats and Lesser Horseshoe bats.

7.3.81 The majority of the bat activity recorded was associated with the dry depression within F4, along H12 and along the northern boundary of F4. Fewer numbers of registrations were also recorded along H1, H2a, H7, H8, H9, H11 and long the eastern boundary of the Application Site (see **Figure 7.10**).

Automated Surveys

Two bat detectors were left out for a minimum of five consecutive nights within the Application Site each month between April and October 2019. The locations where the automated detectors were placed for each month can be seen on **Figures 7.4-7.9**, while the weather conditions for these surveys can be seen at **Appendix 7.2**.

7.3.82 In **April** 2019, two detectors were left out for six nights within the Application Site (see **Figure 7.4**). Low to moderate numbers of bat registrations were recorded on the detector located along the depression between F4 and F7 (see **Table 7.1**), while low numbers of bat registrations were recorded on the detector located along H1 (see **Table 7.2**). At location 1, a total of 475 registration of Common Pipistrelle were recorded, with 71 registrations of *Myotis* sp. and 61 registrations of Lesser Horseshoe bats also recorded. Only low numbers of bat registrations were recorded from Soprano Pipistrelle (20 registrations), with only individual registrations recorded from *Nyctalus* sp. (8 registrations), Serotine (seven registrations), Brown Long-eared bats (five registrations), and Nathusius' Pipistrelle (three registrations).

7.3.83 On the detector left at location 2, a total of 42 registrations were recorded from Common Pipistrelle, 37 registrations were recorded from Lesser Horseshoe bats and 12 registrations were recorded from *Myotis* sp. Only occasional registrations were recorded from *Nyctalus* sp. (six registrations), Nathusius' Pipistrelle (three registrations) and Brown Long-eared bats (two registrations), with a single registration recorded from Serotine.

Table 7.1: Bat Survey Results April 2019 – Location 1

Species	**Number of registrations of each species per date**					
	23.04.19	**24.4.19**	**25.04.19**	**26.04.19**	**27.04.19**	**28.04.19**
Serotine	6	0	0	0	0	1
Myotis sp.	18	19	5	0	3	26
Nyctalus sp.	2	3	0	0	0	3
Common Pipistrelle	254	77	29	1	0	114
Soprano Pipistrelle	5	7	6	0	0	2
Nathusius' Pipistrelle	0	2	0	0	0	1
Brown Long-eared	2	0	0	0	0	3
Lesser Horseshoe	14	5	4	32	3	3

Table 7.2: Bat Survey Results April 2019 – Location 2

Species	Number of registrations of each species per date					
	23.04.19	24.4.19	25.04.19	26.04.19	27.04.19	28.04.19
Serotine	0	1	0	0	0	0
Myotis sp.	4	0	2	0	0	6
Nyctalus sp.	5	1	0	0	0	0
Common Pipistrelle	31	3	0	1	0	7
Nathusius' Pipistrelle	0	0	0	0	0	3
Brown Long-eared	0	0	0	0	0	2
Lesser Horseshoe	10	5	6	4	6	6

7.3.84 In **May** 2019, one detector was left out for five nights (location 1) and a second detector was left out for six nights (location 2) within the Application Site (see **Figure 7.5).** Low numbers of bat registrations were recorded on the detector located at H9 (see **Table 7.3**), while high numbers of bat registrations were recorded for some species on the detector located at H7 (see **Table 7.4**). The majority of registrations recorded at location 1 were from Common Pipistrelle with a total of 353 registrations, with a total of 36 registrations from *Myotis* sp., 18 registrations from Lesser Horseshoe bats also recorded. Only low numbers of bat registrations were recorded from Nathusius' Pipistrelle (three registrations) and Soprano Pipistrelle (two registrations), with a single registration from a Brown Long-eared bat also recorded.

7.3.85 The vast majority of registrations recorded at location 2 were from Common Pipistrelle (a total of 4504 registrations), with lower registrations recorded from Nathusius' Pipistrelle (269 registrations), Soprano Pipistrelle (107 registrations) and *Myotis* sp. Low activity was also recorded from *Nyctalus* sp. (54 registrations), Lesser Horseshoe bats (23 registrations), Brown Long-eared bats (13 registrations), with only individual registrations recorded from Serotine (eight registrations) and Barbastelle *Barbastella barbastellus* (five registrations).

Table 7.3: Bat Survey Results May 2019 – Location 1

Species	Number of registrations of each species per date				
	22.05.19	23.05.19	24.05.19	25.05.19	26.05.19
Myotis sp.	0	6	3	4	23
Common Pipistrelle	19	90	17	82	145
Soprano Pipistrelle	0	0	0	0	2
Nathusius' Pipistrelle	2	1	0	0	0
Brown Long-eared	0	1	0	0	0
Lesser Horseshoe	3	5	0	8	2

Table 7.4: Bat Survey Results May 2019 – Location 2

Species	Number of registrations of each species per date					
	22.05.19	23.05.19	24.05.19	25.05.19	26.05.19	27.05.19
Barbastelle	0	0	1	2	1	1
Serotine	2	0	2	2	2	0
Myotis sp.	41	21	17	14	8	2
Nyctalus sp.	6	6	12	16	9	5
Common Pipistrelle	1184	703	695	1209	575	138
Soprano Pipistrelle	13	49	11	9	21	4
Nathusius' Pipistrelle	64	8	23	161	13	0
Brown Long-eared	1	0	4	5	2	1
Lesser Horseshoe	4	1	7	2	4	5

7.3.86 In **June** 2019, two detectors were left out for five nights within the Assessment Site (see **Figure 7.6**). Low to moderate numbers of bat registrations were recorded on both detectors (see **Table 7.5** and **Table 7.6**). The vast majority of bat registrations recorded at location 1 were of Common Pipistrelle (a total of 586 registrations), with lower less recorded from *Nyctalus* sp. (115 registrations), Lesser Horseshoe (56 registrations) and Brown Long-eared bat (37 registrations). Only low numbers of registrations were recorded from Soprano Pipistrelle (13 registrations), Nathusius' Pipistrelle (13 registrations), *Myotis* sp. (eight registrations) and Serotine (three registrations), with a single registration recorded from Barbarstelle.

7.3.87 On the detector left at location 2, the majority of registrations recorded was also from Common Pipistrelle (a total of 320 registrations), with only low numbers of bat registrations recorded from *Nyctalus* sp. (nine registrations), Nathusius' Pipistrelle (seven registration), *Myotis* sp. (seven registrations), Lesser Horseshoe (five registrations), Soprano Pipistrelle (4 registrations) and Serotine (4 registrations). Only a single registration was recorded from a Brown Long-eared bat.

Table 7.5: Bat Survey Results June 2019 – Location 1

Species	Number of registrations of each species per date				
	13.06.19	14.06.19	15.06.19	16.06.19	17.06.19
Barbastelle	0	0	0	1	0
Serotine	1	0	1	1	0
Myotis sp.	2	4	1	0	1
Nyctalus sp.	26	18	27	34	10
Common Pipistrelle	197	148	65	76	100
Soprano Pipistrelle	9	2	0	0	2
Nathusius' Pipistrelle	3	6	1	0	3
Brown Long-eared	9	7	11	6	4
Lesser Horseshoe	10	9	12	3	22

Table 7.6: Bat Survey Results June 2019 – Location 2

Species	Number of registrations of each species per date				
	13.06.19	14.06.19	15.06.19	16.06.19	17.06.19
Serotine	1	0	2	1	0
Myotis sp.	0	2	4	1	0
Nyctalus sp.	0	1	7	1	0
Common Pipistrelle	49	120	51	63	37
Soprano Pipistrelle	4	0	0	0	0
Nathusius' Pipistrelle	0	2	1	0	4
Brown Long-eared	1	0	0	0	0
Lesser Horseshoe	0	0	1	2	2

7.3.88 In **July** 2019, two detectors were left out for seven nights within the Application Site (see **Figure 7.7**). Low numbers of bat registrations were generally recorded on both detectors (see **Table 7.7** and **Table 7.8**), with moderate numbers of registrations on a couple of nights at location 2. The vast majority of registrations recorded along H1 (location 1) were from *Myotis* sp. (a total of 173 registrations), Lesser Horseshoe (a total of 167 registrations) and Common Pipistrelle (a total of 159 registrations. Lower numbers of bat registrations were recorded from Brown Long-eared bats (50 registrations), Barbastelle (25 registrations), Serotine (seven registrations) and Soprano Pipistrelle (seven registrations). Only a single registration was recorded from Brown Long-eared bat and from Nathusius' Pipistrelle.

7.3.89 The majority of registrations recorded along H9 (location 2) were from Common Pipistrelle (a total of 458 registrations), with lower registrations from *Myotis* sp. (80 registrations), Lesser Horseshoe bats (63 registrations) and *Nyctalus* sp. (54 registrations). Lower activity was also recorded from Brown Long-eared bats (28 registrations), with only three registrations from Serotine and two registrations from both Nathusius' Pipistrelle and Barbastelle.

Table 7.7: Bat Survey Results July 2019 – Location 1

Species	Number of registrations of each species per date						
	10.07.19	11.07.19	12.07.19	13.07.19	14.07.19	15.07.19	16.07.19
Barbastelle	0	0	4	0	0	15	6
Serotine	2	1	1	0	0	2	1
Myotis sp.	25	35	44	38	0	13	18
Nyctalus sp.	16	6	8	12	2	22	13
Common Pipistrelle	28	29	43	29	2	21	7
Soprano Pipistrelle	2	0	1	2	0	2	0
Nathusius Pipistrelle	0	0	0	0	0	0	1
Brown Long-eared	10	11	10	9	1	3	6

Species	Number of registrations of each species per date						
	10.07.19	11.07.19	12.07.19	13.07.19	14.07.19	15.07.19	16.07.19
Lesser Horseshoe	28	52	12	35	0	28	12

Table 7.8: Bat Survey Results July 2019 – Location 2

Species	Number of registrations of each species per date						
	10.07.19	11.07.19	12.07.19	13.07.19	14.07.19	15.07.19	16.07.19
Barbastelle	0	0	0	0	0	2	0
Serotine	0	0	1	1	0	1	0
Myotis sp.	31	8	20	10	0	2	9
Nyctalus sp.	2	8	7	14	4	15	4
Common Pipistrelle	44	66	189	24	2	113	20
Soprano Pipistrelle	6	7	2	2	0	6	3
Nathusius' Pipistrelle	0	0	2	0	0	0	0
Brown Long-eared	9	4	6	4	0	2	3
Lesser Horseshoe	11	8	19	3	0	13	9

7.3.90 In **August** 2019, two detectors were left out for six nights within the Assessment Site (see **Figure 7.8**). Generally low to moderate numbers of bat registrations were recorded along H1 (see **Table 7.9**), while higher numbers of bat registrations were recorded south of the depression at the northern end of H9 (see **Table 7.10**). The majority of registrations recorded along H1 (location 1) were from Common Pipistrelle (a total of 332 registrations), with lower activity recorded from Barbastelle (125 registrations), *Myotis* sp. (120 registrations) and Lesser Horseshoe bats (90 registrations). Lower numbers of bat registrations were also recorded from Brown Long-eared bats (49 registrations), Soprano Pipistrelle (eight registrations), Nathusius' Pipistrelle (four registrations) and a single registration from Serotine.

7.3.91 The vast majority of registrations recorded along the northern section of H9 (location 2) were from Common Pipistrelle (a total of 2918 registrations), with fewer registrations recorded from *Myotis* sp., Soprano Pipistrelle (229 registrations), Brown Long-eared bats (80 registrations). Lower numbers of registrations were also recorded from *Nyctalus* sp. (46 registrations), Lesser Horseshoe bats (32 registrations), Barbastelle (24 registrations), Nathusius' Pipistrelle (eight registrations) and Serotine (five registrations).

Table 7.9: Bat Survey Results August 2019 – Location 1

Species	Number of registrations of each species per date					
	12.08.19	13.08.19	14.08.19	15.08.19	16.08.09	17.08.19
Barbastelle	9	24	57	14	11	10
Serotine	1	0	0	0	0	0
Myotis sp.	12	21	31	14	16	26
Nyctalus sp.	4	9	8	3	4	15
Common Pipistrelle	28	40	100	73	17	74
Soprano Pipistrelle	1	1	1	1	2	2
Nathusius' Pipistrelle	0	0	0	2	0	2
Brown Long-eared	4	3	2	19	10	11
Lesser Horseshoe	11	15	28	6	16	14

Table 7.10: Bat Survey Results August 2019 – Location 2

Species	Number of registrations of each species per date					
	12.08.19	13.08.19	14.08.19	15.08.19	16.08.09	17.08.19
Barbastelle	0	4	16	2	0	2
Serotine	1	0	2	1	1	0
Myotis sp.	82	38	120	22	14	23
Nyctalus sp.	4	8	4	6	8	16
Common Pipistrelle	811	557	1081	278	47	144
Soprano Pipistrelle	48	52	67	26	22	14
Nathusius' Pipistrelle	1	2	2	2	0	1
Brown Long-eared	25	16	24	6	2	7
Lesser Horseshoe	14	5	8	3	2	0

7.3.92 In **September** 2019, two detectors were left out for five nights within the Application Site (see **Figure 7.9**). Low to moderate numbers of bat registrations were recorded south of the depression at the northern end of H9 (see **Table 7.11**), while only very low numbers of bat registrations were recorded along H1 (see **Table 7.12**). The majority of registrations recorded at location 1 were from Common Pipistrelle (a total of 852 registrations), with fewer registrations from *Myotis* sp. (132 registrations), Brown Long-eared bats (86 registrations), Lesser Horseshoe bats (64 registrations), Soprano Pipistrelle (58 registrations) and Nathusius' Pipistrelle (10 registrations). Six registrations from Barbastelle and four registrations from Serotine were also recorded.

7.3.93 Much lower numbers of bat registrations were recorded at location 2, with a total of 21 registrations from *Nyctalus* sp., 20 registrations from Common Pipistrelle, 14 registrations from Brown Long-eared bats, 11 registrations from Lesser Horseshoe bats, seven registrations from *Myotis* sp. and two registrations from Barbastelle (two registrations).

Table 7.11: Bat Survey Results September 2019 – Location 1

Species	Number of registrations of each species per date				
	10.09.19	11.09.19	12.09.19	13.09.19	14.09.19
Barbastelle	2	0	1	3	0
Serotine	0	0	0	0	1
Myotis sp.	24	27	34	15	23
Nyctalus sp.	0	1	0	3	0
Common Pipistrelle	4	736	29	38	45
Soprano Pipistrelle	2	9	0	47	0
Nathusius' Pipistrelle	0	1	2	3	4
Brown Long-eared	44	15	12	11	4
Lesser Horseshoe	13	30	9	3	9

Table 7.12: Bat Survey Results September 2019 – Location 2

Species	Number of registrations of each species per date				
	10.09.19	11.09.19	12.09.19	13.09.19	14.09.19
Barbastelle	0	0	0	1	1
Myotis sp.	2	0	0	5	0
Nyctalus sp.	15	2	0	4	0
Common Pipistrelle	1	3	3	4	9
Brown Long-eared	2	1	0	5	6
Lesser Horseshoe	4	1	0	1	5

7.3.94 In **October** 2019, two detectors were left out for five nights within the Assessment Site (see **Figure 7.10**). Low numbers if bat registrations were recorded along the northern end of H12a (see **Table 7.13**), while only very low numbers of bat registrations were recorded along the southern end of H2a (see **Table 7.14**). The majority of registrations recorded at location 1 were from Common Pipistrelle (a total of 437 registrations), with fewer registrations from *Myotis* sp. (183 registrations), Lesser Horseshoe bats (13 registrations), Brown Long-eared bats (12 registrations) and Soprano Pipistrelle (7 registrations). Three registrations from Barbastelle and *Nyctalus* sp., two registrations from Serotine and a single registration of Nathusius' Pipistrelle were also recorded.

7.3.95 Much lower numbers of bat registrations were recorded at location 2, with a total of 82 registrations from Common Pipistrelle, 36 registrations from Serotine and 19 registrations from *Myotis* sp. Four registrations from Brown Long-eared bats, three registrations from Nathusius' Pipistrelle, two registrations from both *Nyctalus* sp. and Lesser Horseshoe bats and a single registration from both Soprano Pipistrelle and Barbastelle were also recorded.

Table 7.13: Bat Survey Results October 2019 – Location 1

Species	Number of registrations of each species per date								
	22.10.19	23.10.19	24.10.19	25.10.19	26.10.19	27.10.19	28.10.19	29.10.19	30.10.19
Barbastelle	1	0	2	0	0	0	0	0	0
Serotine	1	1	0	0	0	0	0	0	0
Myotis sp.	47	29	49	1	0	9	6	30	11
Nyctalus sp.	3	0	0	0	0	0	0	0	0
Common Pipistrelle	24	39	89	15	0	0	12	62	196
Soprano Pipistrelle	1	5	0	1	0	0	0	0	0
Nathusius' Pipistrelle	0	0	0	0	0	0	1	0	0
Brown Long-eared	10	0	0	0	0	1	1	0	0
Lesser Horseshoe	6	0	5	0	0	0	0	1	1

Table 7.14: Bat Survey Results October 2019 – Location 2

Species	Number of registrations of each species per date								
	22.10.19	23.10.19	24.10.19	25.10.19	26.10.19	27.10.19	28.10.19	29.10.19	30.10.19
Barbastelle	0	0	1	0	0	0	0	0	0
Serotine	0	1	2	3	4	5	6	7	8
Myotis sp.	5	0	5	0	0	2	4	2	1
Nyctalus sp.	1	0	0	0	0	1	0	0	0
Common Pipistrelle	29	22	11	12	0	1	2	3	2
Soprano Pipistrelle	0	0	1	0	0	0	0	0	0
Nathusius' Pipistrelle	1	0	0	0	0	0	1	1	0
Brown Long-eared	2	0	1	0	0	1	0	0	0
Lesser Horseshoe	1	0	0	0	0	0	1	0	0

7.3.96 **Overall Summary.** The vast majority of numbers of registrations recorded on the automated detectors was from Common Pipistrelle (a total of 10502 registrations), with fewer numbers of bat registrations recorded from *Myotis* sp. (a total of 956 registrations), Lesser Horseshoe bats (a total of 529 registrations), Soprano Pipistrelle (a total of 454 registrations), *Nyctalus* sp. (a total of 425 registrations), Brown Long-eared bats (a total of 359 registrations), Nathusius' Pipistrelle (a total of 317 registrations) and

Barbastelle (a total of 190 registrations). Only occasional and low numbers of bat registrations were recorded from Serotine (a total of 32 registrations). The vast majority of Common Pipistrelle registrations recorded on the automated detectors was along H7 and along the northern section of H9 (just before crossing point of H9 and H12). Peak activity of Lesser Horseshoe bats was recorded along H1 and along the northern section of H9 (just before crossing point of H9 and H12). Generally, low numbers of bat registrations were recorded along hedgerows H1, H2a, H11, H9 (south).

7.3.97 The vast majority of bat activity recorded during the activity surveys was from Common Pipistrelle, with less activity recorded from Soprano Pipistrelle, *Nyctalus* sp., Lesser Horseshoe bats, Nathusius' Pipistrelle, *Myotis* sp. and Brown long-eared bats. Concentrations of bat activity was seen at the crossing point of H3 and H1 along hedgerows and trees associated with the demolished farm building B1, along trees east of B7 (in the southwest of F4 associated with the dry depression), along the northern boundary of F4, along hedgerows H7-H11, H12a and at the crossing point of H2 and H2a (southwestern corner of the Application Site). Lower numbers of bat registrations were recorded along H2a, H5, and along the northwestern (H2a and H3), northeastern and eastern boundary of the Application Site and low to no registrations were recorded along H6 and H13.

7.3.98 Overall, from the results of the activity and automated survey results (see **Figure 7.11**), it can be seen that bats use most of the hedgerows within the Application Site to varying degrees throughout the year with areas of greater registrations at the crossing point of H3 and H1 along hedgerows and trees associated with the demolished farm building B1, along H7-H11, along the northern section of H9 (just before crossing point of H9 and H12), at the crossing point of H2 and H2a (see **Figure 7.11B**). Generally, lower numbers of bat registrations were recorded along H1, H2a, H5, H6 and along the northwestern (H2a and H3), northeastern and eastern boundary of the Application Site.

7.3.99 **Background Records.** The GCER returned no records of any bats from within the Application Site itself. The nearest record of a bat roost returned was for a *Pipistrelle* sp. roost located approximately 0.4km southeast of the Application Site in 2016. The nearest field record returned was for Daubenton's bat located approximately 1.6km southwest of the Application Site.

Other Mammals

7.3.100 There is a mature Oak south of H6 within F4 with a used and disused entrance to a fox earth just underneath. During the surveys undertaken, Fox *Vulpes vulpes* was recorded within the Application Site.

7.3.101 Evidence of mammal pathways and push-throughs were recorded throughout the Application Site. During the surveys undertaken Roe Deer *Capreolus capreolus* and Muntjac *Muntiacus reevesi*, were seen to be present on site, and evidence of deer droppings were recorded associated with a number of these pathways.

7.3.102 **Background Records.** No records of any notable mammals were returned by the GCER from within the Application Site itself. Records of mammals returned within the wider search area include European Hedgehog *Erinaceus europaeus*, located approximately 0.5km northwest of the Application Site in 2015 and European Otter *Lutra lutra*, located approximately 1.3km southeast of the Application site in 2016.

7.3.103 It is considered the Application Site offers potentially suitable habitats / opportunities for Hedgehog, but it does not offer any suitable habitat for Otter.

Breeding Birds

7.3.104 Breeding bird surveys were carried out within the Application Site in April, May and June 2019. The dates and weather conditions can be seen in the **Table 7.15** below.

Table 7.15: Breeding Bird Survey Results April – June 2019

Date	Temperature °C	Weather Conditions
26.04.19	7	Clear, dry, no wind
28.05.19	8	Scattered clouds, dry, no wind
20.06.19	9	Clear, dry, no wind

7.3.105 During the survey carried out in **April** 2019, a total of 26 species were recorded within the Application Site, of which Robin *Erithacus rubecula* was confirmed breeding along H5 in the north of the Application Site and 22 species were holding territory or there was suitable habitat present within the Application Site to support breeding. In terms of notable bird species recorded as probably breeding, a total of six House Sparrows *Passer domesticus* (a Red List and Priority Species) were recorded along hedgerows H2a and H3 in the northwestern corner of the Application Site and along H13, a total of six Dunnock *Prunella modularis* (a Priority Species) were recorded associated with hedgerows H1, H5, H6, H8 and H13 in the northern and northeastern area of the Application Site, a total of three Song Thrush *Turdus philomelos* (a Priority Species) were recorded along H2a, H3 and H10 and a single Willow Tit *Poecile montanus* (a Red List and Priority Species) was recorded between H4 and H13. A single Bullfinch (a Priority Species) was recorded as possibly breeding within H11 in the south of the Application Site. Additional species recorded as probably breeding include Blackbird *Turdus merula*, Blackcap *Sylvia atricapilla*, Blue Tit *Cyanistes caeruleus*, Carrion Crow *Corvus corone*, Chiffchaff *Phylloscopus collybita*, Coal Tit *Periparus ater*, Garden Warbler *Sylvia borin*, Goldcrest *Regulus regulus*, Goldfinch *Carduelis carduelis*, Greenfinch *Chloris chloris*, Great Tit *Parus major*, Long-tailed Tit *Aegithalos caudatus*, Woodpigeon *Columba palumbus*, and Wren *Troglodytes troglodytes*, while species recorded as possibly breeding within the Application Site include Great Spotted Woodpecker *Dendrocopos major,* Jackdaw *Corvus monedula*, Magpie *Pica pica*, Grey Heron *Ardea cinerea* and Pheasant *Phasianus colchicus* were also recorded within the Application Site. Details of the species recorded during this survey can be seen on **Figure 7.12**.

7.3.106 In **May** 2019, no birds were confirmed breeding, although a total of 18 species were recorded holding territory or there was suitable habitat present within the Application Site to support breeding. In terms of notable bird species recorded as possibly breeding, a total of three House Sparrows were recorded, along H2a along the western boundary and along H3 in the northwestern corner of the Application Site and a total of two Dunnock were recorded, one along the northern section of H1 and one along the eastern boundary of the Application Site. Additional species recorded as probably breeding within the Application Site include Blackcap, Chiffchaff, Coal Tit, Goldcrest, Goldfinch, Great Tit, and Wren, while species recorded as possibly breeding include Blackbird, Blue Tit, Carrion Crow, Greenfinch, Great Spotted Woodpecker, Nuthhatch *Sitta europaea*, Magpie, Robin and Woodpigeon. Details of the species recorded during this survey can be seen on **Figure 7.13**.

7.3.107 In **June** 2019, no birds were confirmed breeding, although a total of 12 species were recorded holding territory or there was suitable habitat present within the Application Site to support breeding. In terms of notable bird species recorded as possibly breeding, a single House Sparrow was recorded, along H3 in the northwestern corner of the Application Site and a single Dunnock was recorded within H12a south of B3 and B7. Additional species recorded as probably breeding within the Application Site include Blackbird, Chiffchaff, Robin, and Wren, while species recorded as possibly

breeding include Blue Tit, Buzzard *Buteo buteo*, Carrion Crow, Goldfinch, Great Spotted Woodpecker, Magpie and Woodpigeon. Full details of the species recorded during this survey can be seen on **Figure 7.14**.

7.3.108 Two bird boxes were noted on an Ash tree within field F1, north of the demolished building B1. No breeding activity was recorded associated with these bird boxes during any of the surveys undertaken.

7.3.109 **In summary**, a single Robin was confirmed breeding in the north of the Application Site, while notable bird species recorded as probably breeding include House Sparrow (Red List and Priority Species), Willow Tit (Red List and Priority Species), and Dunnock (a Priority Species). Notable bird species noted down as possibly breeding include Bullfinch (a Priority Species), while Partridge (a Priority Species Grey) was also recorded in the southwest Application Site. An additional 25 species recorded holding territory or there was suitable habitat present within the Application Site to support breeding. Overall, this is considered to be an unremarkable assemblage of birds.

7.3.110 **Background Records**. The GCER returned no records of any notable birds from within the Application Site itself, although the most recent record returned for notable bird species was for Red Kite *Milvus milvus* (a Schedule 1, Red List and near threatened species), Red Wing *Turdus iliacus* (a Schedule 1 and Red List species), Peregrine Falcon *Falco peregrinus* (a Schedule 1 species) and Bullfinch (a Priority Species), located within the same four-figure grid square covering the eastern area of the Application site in 2014. Other records returned within this grid square include Marsh Tit *Poecile palustris* and Lesser Redpoll *Acanthis cabaret* (both Red List and Priority Species), Barn Owl *Tyto alba*, Brambling *Fringilla montifringilla* and Common Crossbill *Loxia curvirostra* (all of which are Schedule 1 species) and Woodcock *Scolopax rusticola* (a Red List species) in 2013, as well as Hawfinch *Coccothraustes coccothraustes* (a Red List and Priority Species) in 2012. Further records returned within the wider search area include Song Thrush (a Red List and Priority Species) and Fieldfare *Turdus pilaris* (a Schedule 1 and Red List species), located approximately 0.6km west of the Application Site in 2015 and 2012, respectively, as well as Dunnock (a Priority Species) located approximately 0.6km west of the Application Site in 2015, Spotted Flycatcher *Muscicapa striata* (a Red List and Priority Species), located within the four-figure grid square located approximately 0.7km north of the Application Site in 2014, Black Redstart *Phoenicurus ochruros* (Schedule 1 and Red List species) located approximately 0.9km west of the Application Site in 2011, Yellowhammer *Emberiza citrinella* (a Red List and Priority Species) located approximately 1.4km southwest of the Application Site in 2015, and Kingfisher *Alcedo atthis* (a Schedule 1 species) located approximately 1.5km southwest of the Application Site in 2016.

7.3.111 As set out above, Bullfinch and Dunnock were recorded within the Application Site. Of the above species, although no others were recorded in any of the surveys, it is considered that the hedgerows and trees within the Application Site offer some suitable opportunities for Red Kite, Red Wing, Song Thrush and Spotted Flycatcher, while the grassland offers some suitable opportunities for Barn Owl, as well as wintering opportunities for Brambling, Fieldfare and Lesser Redpoll. It is not considered the Application Site offers suitable opportunities for Black Redstart, Common Crossbill, Hawfinch, Kingfisher, Marsh Tit, Woodcock or Yellowhammer.

Reptiles

7.3.112 Surveys for reptiles were carried out between July and September 2019 within the areas of grassland field margins of field F2–F7. During these surveys no reptiles were recorded within the Application Site. The results along with the weather conditions of these surveys can be seen in the **Table 7.16** below.

Table 7.16: Reptile Survey Results July – September 2019

Survey no.	Date	Weather condition	Temperature °C	Reptile survey results
1	04.07.19	Scattered clouds and dry	15	0
2	10.07.19	Partly cloudy and dry	16	0
3	05.08.19	Scattered clouds and dry	16	0
4	12.08.19	Overcast and dry	15	0
5	21.08.19	Scattered clouds and dry	15	0
6	04.09.19	Overcast and dry	16	0
7	10.09.19	Partly cloudy and dry	15	0

7.3.113 **Background Records.** The GCER returned no records of any reptiles from within the Application Site itself. The closest record returned was for Common Lizard *Lacerta vivipara* located approximately 0.6km northeast of the Application Site in 2016. Other records of reptiles returned include Slow Worm *Anguis fragilis* located approximately 0.7km southwest of the site in 2016 and Adder located approximately 0.8km southwest of the Application Site in 2016.

7.3.114 Given the results of the reptile surveys, it is not considered that reptiles are present within the Application Site. It is considered that the regular cutting management of the grassland fields may not lend itself to the presence of reptiles. Therefore, no further consideration is given to this faunal group within this chapter.

Invertebrates

7.3.115 It is considered that the Application Site is likely to support a range of common invertebrate species, although there is no evidence to suggest that any notable invertebrates would be present.

7.3.116 **Background Records.** The desk study returned no records of any notable invertebrates from within the Application Site itself. There are records of numerous UK Priority moth species from close to the site, albeit many appear to originate from the nearby cemetery to the north. The nearest record returned include UK BAP species August Thorn *Ennomos quercinaria*, Blood Vein *Timandra comae*, Brindled Beauty *Lycia hirtaria*, Buff Ermine *Spilosoma lubricipeda*, Centre-Barred Sallow *Atethmia centrago*, Dark Brocade *Mniotype adusta*, Dot Moth *Melanchra persicariae*, Dusky Thorn *Ennomos fuscantaria*, Feathered Gothic *Tholera decimalis*, Knot Grass *Acronicta rumicis*, Mouse Moth *Amphipyra tragopoginis*, Sallow *Cirrhia icteritia*, September Thorn *Ennomos erosaria* and Shaded Broad-Bar *Scotopteryx chenopodiata*, located within the four-figure grid square located approximately 0.7km north of the Application Site in 2013. The closest record returned for a species protected under Schedule 5 was for Roman Snail, located approximately 0.9km northwest of the Application Site in 2016.

7.3.117 It is considered the Application Site offers some limited opportunities for August Thorn (larval foodplants of this species are Oak and Beech), Blood Vein (larval foodplants include low-growing plants such as Dock), Brindled Beauty (larval foodplants include a range of deciduous trees), Buff Ermine (larval foodplants include herbaceous plants, bushes and trees), Centre-Barred Sallow and Dusky Thorn (larval foodplant for bot species includes Ash), Dark Brocade (larval foodplants include a wide range of herbaceous plants, trees and grasses), Dot Moth (larval foodplants include a wide range of amenity and wild plants), Feathered Gothic (larval foodplants include a range of grasses), Knot Grass (larval foodplants include a range of herbaceous plants), Mouse

Moth (larval foodplants include herbaceous plants, including the flowers, as well as trees such as *Salix* sp.), Sallow (larval foodplant include *Salix* sp. and herbaceous plants), September Thorn (larval foodplants are Oak, Birch *Betula* sp. or Lime *Tilia*sp.) and Shaded Broad-Bar (larval foodplants include *Vicia* sp. and T*rifolium* sp.). However, given the surrounding habitats which also likely support larval foodplants it is not considered that these species would be reliant on the habitats present within the Application Site.

Other Notable Species

7.3.118 A search was carried out as part of the desk study for any ponds within 250m and 500m around the Application Site. There are no aquatic habitats within the Application Site itself, with sub-optimal terrestrial habitats generally available for amphibians (limited to the field margins and hedgerows) given the regular cutting regime within the Application Site. There are 11 ponds within 250m of the Application Site (see **Figure 7.1**), although these ponds are considered to be sufficiently removed from the Application Site and separated by physical dispersal barriers e.g. busy roads and other developments, such that use of the Application Site by Great Crested Newts *Triturus cristatus* is considered very unlikely.

7.3.119 **Background Records.** The GCER returned no records of any Great Crested Newt from within the Application Site itself. A single historic record was returned located approximately 1.3km northeast of the Application Site in 1998.

7.3.120 Given the separation between the ponds and the Application Site by significant newt dispersal barriers in the form of roads and residential development combined with the lack of records for the local area, it is considered highly unlikely that Great Crested Newts would be present within the Application Site. Therefore, no further consideration is given to this faunal group within this document.

7.3.121 There is no evidence from the surveys undertaken or the records returned as part of the desk study to suggest that any other protected or notable fauna would be present within the Application Site.

7.4 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

7.4.1 This section identifies all potentially significant likely effects, both during construction and operation (beneficial and adverse), such that mitigation can be identified where necessary to negate such effects, and enhancements put forward where appropriate.

Construction

Effects on Designated Sites

7.4.2 A number of designated sites are present within the vicinity of the Application Site (see **Figure 7.1**).

Statutory Sites

7.4.3 There are no statutory designated nature conservation sites within the Application Site. The nearest statutory designated site is Cleeve Common Site of Special Scientific Interest (SSSI), which lies approximately 2.7km north-east of the Application Site. As stated above, this SSSI is well separated from the Application Site by minor and major roads, residential development and extensive areas of open countryside and

agricultural land. Impact Risk Zones (IRZ[7]) from the Cleeve Common SSSI partially cover the Application Site and have identified the potential effects on this SSSI from Proposed Development to be from 'any residential developments with a total net gain in residential units'.

7.4.4 The nearest European designation is Dixton Wood SAC, also notified as a SSSI, which lies approximately 8.6km north of the Application Site. Dixton SAC/SSSI is well separated from the Application Site by minor and major roads, residential development and extensive areas of open countryside and agricultural land and none of its IRZs extend into the Application Site.

7.4.5 In addition, Natural England identified three other SSSI's (located within 5km of the Application Site) in their scoping response. Puckham Woods SSSI (located approximately 3.1km east of the Application Site), Lineover Wood SSSI (located approximately 3.5km southeast of the Application Site) and Leckhampton Hill and Charlton Kings Common SSSI (located approximately 3.5km south of the Application Site) are well separated from the Application Site by residential development, major roads and extensive areas of open countryside and agricultural land and none of their IRZs extend into the Application Site.

7.4.6 Natural England's scoping response also refers to the Cotswold Beechwoods SAC (also designated as Cotswold Commons and Beechwoods National Nature Reserve [NNR] and SSSI), located approximately 8.7km southwest of the Application Site. The IRZs of this SAC include the Application Site and have identified the potential effects on this SSSI from Proposed Development to be from 'any residential developments with a total net gain in residential units'.

7.4.7 In addition, there is an IRZ which extends into the southeastern corner of the Application Site, however it is not clear precisely to which of the above listed designations it applies. Nonetheless, it states that the LPA should consult Natural England on likely risks from 'any residential developments with a total net gain in residential units'.

7.4.8 Given the distance between the Application Site (as set out above), it is considered that there would be no effects during the construction phase (either direct or indirect) on any of the above statutory sites.

Non-statutory sites

7.4.9 There are no non-statutory designated nature conservation sites within the Application Site. The nearest non-statutory designated site to the Application Site is Glenfall Wood Key Wildlife Site (KWS) located approximately 0.8km southeast of the Application Site (see **Figure 7.1**).

7.4.10 Given the distance (as set out above) and separation of the Application Site by roads and agricultural land, it is considered that no effects (direct or indirect), will arise to the interest within the KWS as a result of the Proposed Development.

7.4.11 A number of additional statutory and non-statutory sites are located in the wider area (see **Figure 7.1**), but no significant effects (direct or indirect) are anticipated to arise on these sites from the Proposed Development.

7.4.12 **Effects:** None relevant.

[7] "The Impact Risk Zones (IRZs) are a GIS tool developed by Natural England to make an initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI according to the particular sensitivities of the features for which it is notified and specify the types of development that have the potential to have adverse impacts."

Effects on Habitats

7.4.13 The features of relatively greater ecological value within the context of the Application Site include areas of greater botanical interest within fields F2 and F3, hedgerows and trees.

7.4.14 The primary habitat loss to the Proposed Development will be to amenity and semi-improved grassland fields (F1, F4, F5 and F7) and to the northern halves of semi-improved grassland fields (F2, F3 and F6), as well as to hedgerows (a section of H1 and minor sections of H5, H6, H7, H9, H11, H12 and H12a to facilitate access and small sections of H2a and H3 to facilitate pedestrian access). Where losses occur they could be more than offset through the creation of habitats of equal or greater value, included within areas of open green space, and planted with species of known value to wildlife.

Amenity Grassland and Amenity Planting

7.4.15 There is one amenity grassland field and areas of neglected amenity planting associated with the demolished farmhouse B1 in the north of the Application Site, which are of limited ecological value in terms of their species content.

7.4.16 The majority of the amenity grassland and amenity planting is to be lost to the Proposed Development.

7.4.17 **Effects:** Loss of the majority of the neutral grassland field an amenity planting to the Proposed Development.

7.4.18 Prior to mitigation, effects will be at the **site level** and of **negligible significance**.

Semi-improved Grassland

7.4.19 There are six semi-improved grassland fields within the Application Site (F2-F7), of which parts of F2 and F3 are deemed to be of greater ecological value in terms of species content, including species indicative of Lowland Meadow Priority Habitats. The majority of the other fields supports species, which are common and widespread and only remnants of the Lowland Meadow indicator species present with grasses being dominant.

7.4.20 The majority of the semi-improved grassland fields F2-F7 are to be lost to the Proposed Development, although the southern areas of F2, F3 and F6 are to be retained as public open space.

7.4.21 **Effects:** Loss of the majority of the semi-improved grassland fields, including parts of the areas with increased botanical interest, and conversion to open space.

7.4.22 Prior to mitigation, effects will be **adverse** at the **local level** and of **moderate significance**.

Hedgerows and Trees

7.4.23 There are 13 hedgerows within the Application Site, six of which are considered likely to qualify as important, comprising seven or more native woody species (H1, H2, H6, H9, H10, H12). Another five of the hedgerows are considered to be species-rich, comprising five or more native woody species (H3, H5, H7, H11, H13). All hedgerows, a number of which contain mature trees, are considered to be of some ecological value in the context of the Application Site, in particular the species-rich and potentially 'important' hedgerows, offering foraging and nesting opportunities for birds,

foraging, navigation and roosting resources for bats and creating generally green corridors for a range of wildlife.

7.4.24 There will be losses to the hedgerow network to facilitate a new main access road and to facilitate the residential development, including sections of hedgerows likely to qualify as 'important' under the Hedgerow Regulations 1997 (a section of H1 and minor sections of,H6, H9, H11 and H12), minor sections of species-rich hedgerows (H3, H7 and H12) and small sections of species-poor hedgerows (H2a, H5 and H12a). However, the majority of existing hedgerows will remain. The Illustrative Masterplan at **Figure 4.1** shows the envisaged relationship between retained and proposed new native hedgerows, to be further specified at the reserved matters stage.

7.4.25 There is one mature Oak tree with an occasionally used summer day roost used by a single Noctule bat. This tree is to be retained within the Proposed Development.

7.4.26 A small number of standard trees are to be lost within the Application Site.

7.4.27 **Effects:** Losses to the hedgerow network and associated trees and a small number of other standard trees. Temporary effects: dust (and potentially other pollution) to retained hedgerows and trees during construction phase. Potential damage to retained hedgerows and trees during construction phase.

7.4.28 Prior to mitigation, effects will be **adverse** at the **local level** and of **moderate significance**.

Dry Depression, Ruderal Vegetation and Ruderal-dominated Grassland

7.4.29 There is a shallow depression running from the northern end of H9 to the northern end of H12a, which was seen to be 'dry' (damp but no standing water) throughout Ecology Solutions surveys. This area is of some limited ecological value in the context of the Application Site mainly by virtue of the 'corridor' it creates for wildlife in association with trees. This feature is to be retained within the Proposed Development.

7.4.30 There are areas of ruderal vegetation and ruderal-dominated grassland generally associated with the buildings in the north of the Application Site. These areas are of negligible ecological value. The ruderal vegetation and ruderal-dominated grassland are to be lost to the Proposed Development.

7.4.31 **Effects:** Loss of ruderal vegetation and ruderal-dominated grassland.

7.4.32 Prior to mitigation, effects will be at the **site level** and of **negligible significance**.

Scattered Scrub, Bramble Scrub and Cleared Bramble Scrub

7.4.33 There are small areas of scattered scrub and cleared Bramble scrub present within the Application Site, generally associated with F7 and with the eastern boundary of the Application Site.

7.4.34 The majority of these areas of scattered scrub and cleared Bramble scrub are of negligible value and are to be lost to the Proposed Development.

7.4.35 **Effects:** Loss of this habitat.

7.4.36 Prior to mitigation, effects will be at the **site level** and of **negligible significance**.

Buildings and Hardstanding

7.4.37 There are six buildings (B2-B7) present in the northern area of the Application Site (building B1 was subsequently demolished in October 2019 under planning consent 19/01610/DEMCON), which are of negligible ecological value with no evidence of use by roosting bats (including feeding perches) or use by breeding birds (nests). In addition, there are small areas of hardstanding present within the Application Site, associated with the buildings.

7.4.38 The buildings and areas of hardstanding are to be lost to the Proposed Development.

7.4.39 **Effects:** No relevant effects.

Cleared Ground

7.4.40 There is an area of cleared ground in the north of the Application Site. In this area B1 was demolished (under planning consent 19/01610/DEMCON) in October 2019.

7.4.41 The area of cleared ground is to be lost to the Proposed Development.

7.4.42 **Effects:** No relevant effects.

Effects on Fauna

Badgers

7.4.43 **Legislation.** The Protection of Badgers Act 1992 consolidates the previous Badgers Acts of 1973 and 1991. The legislation aims to protect the species from persecution, rather than being a response to an unfavourable conservation status, as the species is in fact common over most of Britain, with particularly high populations in the southwest.

7.4.44 As well as protecting the animal itself, the 1992 Act also makes the intentional or reckless destruction, damage or obstruction of a Badger sett an offence. A sett is defined as "any structure or place which displays signs indicating current use by a Badger". "Current use" of a Badger sett is defined by Natural England as "how long it takes the signs to disappear", or more precisely, to appear so old as to not indicate "current use".

7.4.45 In addition, the intentional elimination of sufficient foraging area to support a known social group of Badgers may, in certain circumstances, be construed as an offence by constituting 'cruel ill treatment' of a Badger.

7.4.46 **Application Site usage**. No evidence of any Badger setts was recorded within the Application Site. However, evidence of mammal pathways and push-throughs were recorded throughout the Application Site and it is not possible to rule out are use by Badgers given they are known be present in the local area.

7.4.47 As set out above, although areas of the grassland fields are to be lost, large areas of open space will be retained within the Proposed Development.

7.4.48 **Effects**: Loss of part of potential foraging grounds.

7.4.49 Prior to mitigation, effects are **adverse** at the **County level** and are of **minor significance**.

Bats

7.4.50 **Legislation**. All bats are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and included on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 ("the Habitats Regulations"), as amended. These include provisions making it an offence:

- Deliberately kill, injure or take (capture) bats;
- Deliberately disturb bats in such a way as to be likely to significantly affect:-
  - the ability of any significant group of bats to survive, breed or rear or nurture their young; or to hibernate; or
  - to affect significantly the local distribution or abundance of the species concerned;
- Damage or destroy any breeding or resting place used by bats;
- Intentionally or recklessly obstruct access to any place used by bats for shelter or protection (even if bats are not in residence).

7.4.51 While the legislation is deemed to apply even when bats are not in residence, Natural England guidance suggests that certain activities such as re-roofing can be completed outside sensitive periods when bats are not in residence provided these do not damage or destroy the roost.

7.4.52 The words 'deliberately' and 'intentionally' include actions where a court can infer that the defendant knew 'the action taken would almost inevitably result in an offence, even if that was not the primary purpose of the act.

7.4.53 The offence of damaging (making it worse for the bat) or destroying a breeding site or resting place is an absolute offence. Such actions do not have to be deliberate for an offence to be committed.

7.4.54 Licences can be granted for development purposes by an 'appropriate authority' under Regulation 55 (e) of the Habitats Regulations. In England, the 'appropriate authority' is Natural England (the government's statutory advisors on nature conservation). European Protected Species licences permit activities that would otherwise be considered an offence.

7.4.55 In accordance with the Habitats Regulations the licensing authority (Natural England) must apply the three derogation tests as part of the process of considering a licence application. These tests are that:

- The activity to be licensed must be for imperative reasons of overriding public interest or for public health and safety;
- There must be no satisfactory alternative; and
- The favourable conservation status of the species concerned must be maintained.

7.4.56 Licences can usually only be granted if the development is in receipt of full planning permission (and relevant conditions, if any, discharged).

7.4.57 Seven species of bat are Priority Species, these are Barbastelle, Bechstein's *Myotis bechsteinii*, Noctule, Soprano Pipistrelle, Brown Long-eared, Greater Horseshoe *Rhinolophus ferrumequinum* and Lesser Horseshoe.

7.4.58 **Application Site usage**. There is one mature Oak tree with an occasionally used summer day roost used by a single Noctule bat and 14 other trees within the hedgerows and grassland fields within the Application Site that have developed features

potentially suitable to support roosting bats. The mature Oak tree with an occasionally used summer day roost as well as all other trees with bat potential features are to be retained within the Proposed Development.

7.4.59 None of the buildings (including the now demolished B1) have any evidence of use by roosting bats (including feeding perches).

7.4.60 From the results of the activity and automated survey results (see **Figure 7.11** and **Figure 7.12**), it can be seen that bats use most of the hedgerows within the Application Site to varying degrees throughout the year with areas of greater registrations at the crossing point of H3 and H1 along hedgerows and trees associated with the demolished farm building B1, along hedgerows H7-H11, along the northern section of H9 (just before crossing point of H9 and H12) and at the crossing point of H2 and H2a. Lower numbers of bat registrations were recorded along H1, H2a, H5, H6 and along the northwestern (H2a and H3), northeastern and eastern boundary of the Application Site.

7.4.61 The vast majority of bat use recorded within the Application sire was from Common Pipistrelle, a very common and widespread species within Gloucestershire and the UK. This species can occur in almost all habitats available, including city centres, however areas of woodland and the presence of water bodies is generally preferred. Fixed flightpaths are used for foraging along linear structures. Evidence of use was also recorded from Soprano Pipistrelle, also a very common and widespread species within Gloucestershire and the UK. This species is more strongly dependent on the presence of riparian woodland, lowlands and water bodies than the Common Pipistrelle. Foraging grounds for Soprano Pipistrelle are strongly associated with vegetation, including branches overhanging water, small glades in woodlands and small water bodies.

7.4.62 There is evidence of occasional use by rarer species, i.e. Barbastelle and Lesser Horseshoe bats, albeit at relatively low levels and it is clear that these species are not reliant on the Application site. In Gloucestershire, as elsewhere in the UK, Barbastelle is a rare species usually found roosting in trees in mature woodland during the summer and in underground sites during winter. Indeed, Barbastelle is being more commonly recorded with the improvement of bat detector equipment suggesting it is more common than previously thought and likely under-recorded. Lesser Horseshoe bats are a relatively common species in Gloucestershire, even though their distribution in the UK is restricted to southwest Britain (and western Ireland). Important strongholds in Gloucestershire include the Forest of Dean District and the Stroud valleys. Lesser Horseshoe bats are woodland foraging species and roost in old buildings (houses, churches, stables and barns) and underground sites.

7.4.63 Other bat species recorded within the Application site include *Nyctalus* sp., with a single Noctule bat recorded roosting in an Oak tree in the north of the Application Site. Noctule bats are fairly widespread in Gloucestershire and have a large spectrum of habitat, including riparian woodlands, temperate beech forests and cities. Hunting grounds may include water bodies, riparian woodlands, meadows, streetlamps and generally areas of dense vegetation or the presence high flying insects. Evidence of use was also recorded from Brown Long-eared bats, a relatively common species in Gloucestershire, which roosts in buildings and forages mainly in woodland. Clusters of Brown Long-eared roosts have predominantly been recorded in the Forest of Dean, in the Stroud valleys and within the Cotswold Waterpark. In addition, there is evidence of very seldom use by Nathusius' Pipistrelle, which is a migratory species and often associated with large water bodies. This species is considered rare in the UK; however, it may simply be under-recorded. In Gloucestershire this species is also considered to be rare, with the only roost recorded within the Cotswold Waterpark. Within Gloucestershire the Cotswold Waterpark, as well as the Stroud valleys, are also important roosting areas for Serotine bats.

7.4.64 The vast majority of the hedgerow network is to be retained and set within green corridors within the Proposed Development, with some losses to facilitate residential dwellings, roads and new access roads/footpath links. A section of fedgerow H1, and minor sections of H2a, H3, H6, H7, H9, H12 and H12a are to be lost to the Proposed Development. In general, bat use of H1 was seen to be low.

7.4.65 **Effects**: Loss / severance of sections of hedgerows that offer suitable foraging and commuting opportunities for bats including Lesser Horseshoe bats and Barbastelle. Albeit H1 is generally only to see low bat usage. Potential disturbance from lighting on foraging and commuting routes during construction.

7.4.66 Potential accidental damage / disturbance to Noctule roost in T1 during construction.

7.4.67 Prior to mitigation, effects will be **adverse** at the **European level** and of **minor - moderate significance**.

Other Mammals

7.4.68 **Application Site usage**. Evidence of Fox, Roe Deer and Muntjac was recorded within the Application Site during the surveys undertaken. Evidence of mammal pathways and push-throughs were recorded throughout the Application Site and it is possible that the pathways are used by a range of common mammals but none of any particular note.

7.4.69 As set out above, although areas of the grassland fields are to be lost, large areas of open space will be retained within the Proposed Development.

7.4.70 **Effects:** Loss of suitable foraging habitat for a range of common mammals.

7.4.71 Prior to mitigation, effects will be at the **site level** and of **negligible significance**.

Birds

7.4.72 **Legislation.** Section 1 of the Wildlife & Countryside Act is concerned with the protection of wild birds. With certain exceptions all wild birds and their eggs are protected from intentional killing, injuring and taking; and their nests, whilst being built or in use, cannot be taken, damaged or destroyed.

7.4.73 Schedule 1 of the Wildlife & Countryside Act 1981 is a list of the nationally rarer and uncommon breeding birds for which all offences carry special (i.e. greater) penalties. These species also enjoy additional protection whilst breeding, as it is also an offence to disturb adults or their dependant young when at the nest.

7.4.74 **Application Site usage**. Overall the bird surveys recorded an unremarkable ornithological assemblage at the Application Site. Of the notable bird species recorded at the Application site House Sparrow (Red List and Priority Species), Willow Tit (Red List and Priority Species) and Dunnock (Priority Species) were probably breeding, while Bullfinch (Priority Species) was possibly breeding. House Sparrows were recorded predominantly within the northwestern corner of the Application Site associated with H2a and H3. A single Willow Tit was recorded associated with H4 and H5 in the north of the Application Site, while Dunnock was recorded mainly associated with H1, H5, H13 in the north of the Application Site and H6 and H8 in the east of the Application Site. A single Bullfinch was recorded associated with H11 along the southern boundary of the Application Site. In addition, Grey Partridge was recorded within in the southwest Application Site.

7.4.75 Further, a single Robin was confirmed as breeding in the north of the Application Site, and an additional 25 common species were recorded holding territory or there was suitable habitat present within the Application Site to support breeding. These species were recorded associated with hedgerows, trees and buildings within the Application Site. It is considered that the hedgerows and trees within the Application Site offer suitable nesting and foraging opportunities for birds.

7.4.76 The majority of the hedgerow network is to be retained within the Proposed Development. However, sections of hedgerows are to be lost to facilitate a new main access road and residential development (including a section of hedgerow H1 and minor sections of H2a, H3,H5, H6, H7, H9, H11, H12 H12a and H13).

7.4.77 **Effects**: Loss of suitable foraging and nesting habitat for birds. Potential for killing or injury and / or damage or destruction of nests during clearance of vegetation.

7.4.78 Prior to mitigation, effects are **adverse** at the **local level** and are of **minor significance.**

Invertebrates

7.4.79 **Application Site usage**. Given the habitats present, it is likely an assemblage of common invertebrate species would be present within the Application Site.

7.4.80 As set out above, the majority of the hedgerow network and the southern areas of semi-improved grassland fields F2, F3 and F6 are to be retained as areas of open space within the Proposed Development.

7.4.81 **Effects:** Loss of suitable habitat for common invertebrates.

7.4.82 Prior to mitigation, effects will be at the **site level** and of **negligible significance**.

Operation

Effects on Designated Sites

Statutory sites

7.4.83 As set out above, the nearest statutory designated site is Cleeve Common SSSI (located approximately 2.7km north-east of the Application Site), which is well separated from the Application Site. The IRZs from the Cleeve Common SSSI partially cover the Application Site and have identified the potential effects on this SSSI from Proposed Development to be from 'any residential developments with a total net gain in residential units'.

7.4.84 As previously mentioned, Dixton Wood SAC (also notified as a SSSI) is the nearest European designation (located approximately 8.6km north of the Application Site) and is well separated from the Application Site. None of its IRZs extend into the Application Site.

7.4.85 As stated above, Natural England identified three additional SSSI's (Puckham Woods SSSI [located approximately 3.1km east of the Application Site], Lineover Wood SSSI [located approximately 3.5km southeast of the Application Site] and Leckhampton Hill and Charlton Kings Common SSSI [located approximately 3.5km south of the Application Site]) located within 5km of the Application Site in their scoping response. These SSSIs are well separated from the Application Site and none of their IRZs extend into the Application Site.

7.4.86 As set out above, the Cotswold Beechwoods SAC (located approximately 8.7km southwest of the Application Site) was also identified in Natural England's scoping response. The IRZs of this SAC include the Application Site and have identified the potential effects on this SAC from the Proposed Development to be from 'any residential developments with a total net gain in residential units'.

7.4.87 A Briefing Note (see **Appendix 7.3**) has been produced to provide information required for a Habitat Regulation Assessment (HRA) for the Cotswold Beechwoods SAC as requested in correspondence from Natural England (dated 24th May 2019). As concluded within this Briefing Note, it is considered that there would be no effects from the Proposed Development either direct or indirect, alone or in combination with other developments on the Cotswold Beechwoods SAC.

7.4.88 This is based on the presence of alternative recreation resources (alternative open spaces and circular walks originating directly from the Application Site utilising Public Right of Ways [PROW]) within close proximity of the Application Site.

7.4.89 The same principles relating to alternative recreation resources apply for the Cleeve Common SSSI as set out in the HRA for the Cotswold Beechwoods SAC (see **Appendix 7.3**). Therefore, it is considered that the net gain in residential units within the Proposed Development would also not (directly or indirectly) effect the Cleeve Common SSSI.

7.4.90 **Effects:** Given the distance between the Application Site and the statutory sites (as set out above) and the presence of alternative recreation resources, it is considered that no direct / indirect effects would arise during the operational phase.

Non-statutory sites

7.4.91 As set out above, the nearest non-statutory designated site to the Application Site is Glenfall Wood KWS. This KWS does not appear to be accessible to the public and no public footpaths run through the site. As such, it is considered that no direct / indirect effects would arise at the operational phase.

7.4.92 **Effects**: No relevant effects.

Effects on Habitat

7.4.93 The majority of adverse effects on habitats arise during the construction phase and it is not considered that any significant adverse effects would arise at the operational phase.

7.4.94 **Effects**: No relevant effects.

Effects on Fauna

Bats

7.4.95 **Effects:** Potential disturbance from lighting on foraging and commuting routes and the Noctule tree roost during the operational phase. Nonetheless Noctule bats are relatively tolerant of lighting compared to other bat species.

7.4.96 Prior to mitigation effects are **adverse** at the **European** level and of **minor-moderate significance.**

Other Fauna

7.4.97 **Effects:** It is not considered that there will be any significant adverse effects on any other faunal groups at the operational phase.

Decommissioning

7.4.98 Given the nature and intended longevity of the Proposed Development's operational life, decommissioning has not been considered relevant as part of this study. Accordingly, the EIA is to focus on the potential likely significant effects of the Proposed Development during construction and operational phases.

MITIGATION AND ENHANCEMENT

Mitigation by Design

Designated Sites

Statutory sites

7.4.99 It is considered that no mitigation would be required in relation to Cleeve Common SSSI, Dixton Wood SAC/SSSI, Puckham Woods SSSI, Lineover Wood SSSI, Leckhampton Hill and Charlton Kings Common SSSI and Cotswold Beechwoods SAC/NNR/SSSI or any other statutory sites.

Non-statutory sites

7.4.100 It is considered that no mitigation would be required for the Glenfall Wood KWS or any other non-statutory sites.

Habitats

Amenity Grassland and Amenity Planting

7.4.101 Losses to the amenity grassland and planting will be mitigated for through the creation of new areas of gardens and public open space as areas of the Proposed Development, which will provide similar habitat types, will be sown / oversown using a native species-rich grassland seed mixture (such as Emorsgate's Flowering Lawn Mixture EL1 or Standard General Purpose Meadow Mixture EM2) and be subject to a suitable management regime to maximize the floristic diversity post development. These measures will compensate for the loss of the amenity grassland. The planting of new native shrubs throughout the public areas and gardens within the Proposed Development will also compensate for the loss of small areas of amenity planting.

7.4.102 Post mitigation (and enhancements), effects are **beneficial** at the **site level** and are of **minor significance**.

Semi-Improved Grassland

7.4.103 Losses to areas of semi-improved grassland, including parts of the areas with increased botanical interest, will be mitigated for through the creation of new areas of species-rich meadow grassland as part of the Proposed Development. These areas will be sown / oversown using green hay spread from existing areas of high botanical interest or by use of an appropriate native species-rich grassland seed mixture (such as Emorsgate's Standard General Purpose Meadow Mixture EM2).

7.4.104 In addition, new grassland will be created around the new SUDS feature in the northwest of the Application Site and sown / oversown with using a native species-rich grassland seed mixture (such as Emorsgate's Standard General Purpose Meadow Mixture EM2).

7.4.105 Post mitigation (and enhancements), effects are **beneficial** at the **local level** and are of **minor-moderate significance**.

Hedgerows and Trees

7.4.106 The majority of the hedgerow network is to be retained within green corridors within the Proposed Development. A section of hedgerow H1 and minor sections of H2a, H3, H5, H6, H7, H9, H11, H12, H12a and H13 are to be lost to the Proposed Development.

7.4.107 Standard engineering and best practice measures will be employed to ensure that dust deposition and any other pollution (e.g. contaminated run-off) is prevented from reaching retained hedgerows / trees. Any potentially detrimental effects of dust contamination will be mitigated through standard industry best practice measures. In any event, the residual effect of the construction of the Proposed Development will be short term, with construction dust infrequently affecting sensitive receptors in the long-term.

7.4.108 Measures will be put in place to ensure that retained hedgerows, sections of hedgerows and all retained trees within the Application Site are safeguarded from direct effects during the construction phase, e.g. fenced canopy width (as required) according to the current British Standards before construction work commences, to protect roots from compaction and to prevent encroachment into these areas by construction machinery. No construction machinery or materials will be stored within these areas at any point during the development. Fences will remain in place until construction work is complete within the vicinity of these hedgerows. Regard would also need to be had for potential effects on nesting birds during the loss of this habitat (see Birds below).

7.4.109 New native trees / block planting and hedgerow planting will be of greater length to that lost and new planting will be based around native species of local provenance.

7.4.110 The minor losses of trees within the Application Site will be more than offset by new landscape planting which includes a number of new trees and will enhance existing foraging areas and commuting routes for wildlife and increase the botanical diversity of the Application Site.

7.4.111 Post mitigation (and enhancements), effects are **beneficial** at the **local level** and are of **moderate significance**.

Other habitats

7.4.112 No specific mitigation is required for the loss of any other habitats.

Fauna

Badgers

7.4.113 During the surveys no Badger setts or specific evidence of Badgers were recorded within the Application Site itself. Evidence of mammal pathways and push-throughs were recorded throughout the Application Site and it is possible that the pathways are used by Badgers as well as other mammals.

7.4.114 The creation of new areas of species-rich wildflower grassland and enhancements of existing grasslands as part of the Proposed Development will maintain suitable foraging opportunities for Badgers, that occasional use the Application Site. In addition, the planting of new hedgerows and blocks tree-planting throughout the areas of open space will provide additional foraging opportunities and cover for Badgers.

7.4.115 The green infrastructure through the Application Site, associated with the hedgerows, trees and dry depression, will ensure dispersal routes are retained for Badgers through the Application Site.

7.4.116 During the construction phase of development it is often necessary to undertake a number of additional measures to safeguard any Badgers present on a site, particularly in regard to disturbance and other related issues.

7.4.117 Any trenches or deep pits that are to be left open overnight will be provided with a means of escape should a Badger enter. This could simply be in the form of a roughened plank of wood placed in the trench as a ramp to the surface. This is particularly important if the trench fills with water.

7.4.118 Any trenches/pits will be inspected each morning to ensure no Badgers have become trapped overnight. Should a Badger get stuck in a trench it will likely attempt to dig itself into the side of the trench, by forming a temporary sett. Should a trapped Badger be encountered, the project ecologist will be contacted immediately for further advice.

7.4.119 The storage of topsoil or other 'soft' building materials within the Application Site will be given careful consideration. Badgers will readily adopt such mounds as setts, which would then be afforded the same protection as established setts. So as to avoid the adoption of any mounds, they would be subject to daily inspections (or nightly patrols if 24 hour security is present on site) or consideration given to fencing them with Badger proof fencing.

7.4.120 During the development the storage of any chemicals required for the building construction will be well away from any Badger activity and contained in such a way that they cannot be accessed or knocked over by any roaming Badgers.

7.4.121 Post mitigation, effects are at the **County level** and are of **no significance** (i.e. neutral).

Bats

7.4.122 Construction activities will generally be limited to the daytime, and as such lighting will not likely be required. However, if lighting is necessary during construction, any potential light spillage will be reduced by directing light below the horizontal plane, preferably at an angle less than 70 degrees away from features that offer suitable foraging opportunities for bats, e.g. hedgerows and trees.

7.4.123 During the operational phase, although there is likely to be an increase in lighting within the Application Site, dark corridors will be maintained through the green corridors, whereby a sympathetic lighting regime will be employed, involving the use of directional, low-powered LED lighting (or similar) to minimise light spillage. The details of the lighting scheme could be secured by way of planning condition.

7.4.124 The Oak tree (T1) with an occasionally used summer day roost for Noctule bat in the north of the Application Site and the other trees with potential to support roosting bats will all be buffered from the Proposed Development and retained in dark corridors

(as part of any detailed lighting scheme) to allow continued movement by bats through the Application Site.

7.4.125 To offset the loss of existing hedgerows, features akin to a woodland ride will be created within new block planting and along green corridors within the Application Site to provide enhanced foraging and navigational opportunities for bats including Lesser Horseshoe bats and Barbastelle and to offset loss of existing flight lines (albeit losses tend to be of features with lower bat use in any event).

7.4.126 In addition, large areas of open space will be created within the Application Site, that will be sown / oversown with a native species-rich wildflower seed mixture, which will provide an invertebrate food source for foraging bats. The areas of open space will also be subject to new native tree and hedgerow planting, and a SUDS feature created in the northwest, which will diversify habitats present and provide enhanced foraging opportunities for bats, including Common Pipistrelle, Soprano Pipistrelle Nathusius' Pipistrelle, *Nyctalus* sp. and Serotine.

7.4.127 Post mitigation effects are **beneficial** at the **European level** and are of **minor-moderate significance**.

Birds

7.4.128 The provision of new native trees / block planting and hedgerows throughout the areas of open space will provide suitable new nesting opportunities for a range of bird species, while the creation of new areas of wildflower grassland and enhancement of existing grassland will provide new and enhanced foraging opportunities.

7.4.129 In order to safeguard any nesting bird species within the Application Site, the clearance of any hedgerows and trees will be undertaken outside of the bird breeding season (March-July inclusive). Should this not be possible potential nesting habitat will be subject to a check survey immediately prior to its removal by an experienced ecologist. Should any nesting birds be identified then the nest will be fully safeguarded in situ and subject to a disturbance buffer of at least 5 metres and only removed once it has been confirmed any fledglings have left the nest.

7.4.130 Post mitigation, effects are at the **site level** and are of **no significance** (i.e. neutral).

Invertebrates

7.4.131 No mitigation is technically required for this group. However, the creation of new habitats, including wildflower grassland, hedgerow / tree / scrub planting, and SUDS feature will provide new and enhanced opportunities for a range of common invertebrates (see enhancements).

7.4.132 Post mitigation, effects are **beneficial** at the **site level** and are of **moderate significance**.

Additional Mitigation

Habitats

Semi-improved grassland

7.4.133 The retained and newly created / enhanced grasslands will be subject to a suitable management regime to increase the floristic diversity of the Application Site.

This could be secured by way of a planning condition requiring a Landscape and Ecological Management Plan (LEMP).

Hedgerows and trees

7.4.134 Standard engineering and best practice measures will be employed to ensure that dust deposition and any other pollution (e.g. contaminated run-off) is prevented from reaching retained hedgerows / trees. Any potentially detrimental effects of dust contamination will be mitigated through standard industry best practice measures.

7.4.135 Measures will be put in place to ensure that retained hedgerows / trees are safeguarded from direct effects during the construction phase according to the current British Standards before construction work commences and until construction work is complete within the vicinity of the retained hedgerows / trees. No construction machinery or materials will be stored within these areas at any point during the development.

7.4.136 It is suggested that the mitigation set out above could be secured by way of planning condition requiring the production of a Construction Environmental Management Plan (CEMP).

Fauna

Badgers

7.4.137 All contractors working on the Application Site will be briefed regarding the presence of Badgers in the local area and of the types of activities that would not be permissible on site, with all measures included as part of a CEMP.

Bats

7.4.138 Construction activities will generally be limited to the daytime, and as such lighting will not likely be required. However, if lighting is required, this will be directed away from the hedgerows and green corridors, to allow dark corridors to be retained and this could be secured as part of the CEMP, if required. It should be noted that lighting is most likely required in winter when days are shorter and bats are in hibernation, and thus again such work would not likely affect bats.

Table 7.17: Mitigation

Ref	Measure to avoid, reduce or manage any adverse effects and/or to deliver beneficial effects	How measure would be secured		
		By Design	By S.106	By Condition
Statutory Designated Sites	Mitigation is not required but enhancements are to include Homeowner Information Packs which could be secured by way of planning condition			X
Amenity Grassland and Planting	Creation of new native species-rich grassland and planting of new native shrubs and subsequent management via LEMP	X		X
Semi-improved Grassland	Creation of new wildflower grassland, enhancement of retained grasslands and creation of new grassland around new SUDS feature and subsequent management via LEMP	X		X
Hedgerows and Trees	Ensure protection of retained hedgerows and trees during construction, planting of new native hedgerows, trees and block planting and subsequent management via LEMP	X		X
Other habitats	N/A			
Badgers	Creation of new species-rich wildflower grassland, enhancements of existing grassland, planting of new hedgerows and block planting, plus safeguards to protect Badgers during construction	X		X
Bats	Planting of new native hedgerows, trees and shrubs, creation of new wildflower grassland and new SUDS feature. Installation of a sensitive lighting regime. Provision of new bat boxes	X		X
Birds	Clearance of nesting vegetation outside nesting season. Planting of new native hedgerows, trees and shrubs, creation of new wildflower grassland and new SUDS. Provision of new nest boxes	X		X

Invertebrates	Planting of new native hedgerows, trees and shrubs, creation of new wildflower grassland and new SUDS	X		

Enhancements

Designated Sites

Statutory

7.4.139 Although no mitigation is deemed to be required Homeowner Information Packs (HIPs) will be included as part of the proposed development and will give new homeowners information to help them make informed choices about where to go for informal outdoor leisure and if they choose to visit sensitive sites, it will provide information on how to avoid impacting sensitive areas.

Non-statutory

7.4.140 None.

Habitats

Semi-Improved Grassland

7.4.141 Retained areas of grassland will be enhanced and together with newly created areas of grassland will be subject to a suitable management regime to increase the floristic diversity of the Application Site. This could be secured via a planning condition requiring a LEMP (see above).

7.4.142 Post enhancements, effects are **beneficial** at the **local level** and are of **minor-moderate significance**.

Hedgerows and Trees

7.4.143 As described above, the new proposed planting would offset any losses. Indeed, new hedgerow / tree planting, will be of greater length to that lost and thus represent an enhancement. The new planting will be based around native species of local provenance.

7.4.144 The inclusion of fruit-bearing trees / shrubs will provide seasonal foraging opportunities for a range of wildlife including birds and bats.

7.4.145 Post enhancements, effects are **beneficial** at the **site level** and are of **moderate significance**.

Other Habitats

7.4.146 The new SUDS feature will diversify existing habitats within the Application Site by creating a habitat type that does not currently exist (other than the one 'dry' depression which is also to be retained). This feature will be surrounded with species-rich grassland and native scrub / hedgerow planting and will be planted with native aquatic vegetation.

7.4.147 No further enhancements are required for any other habitats.

7.4.148 Post enhancements, effects are **beneficial** at the **site level** and are of **minor significance**.

Fauna

Bats

7.4.149 As described already, the provision of new planting (trees / hedges / block planting) would not only mitigate loss of some existing habitat but would be proposed at such an extent as to represent an enhancement. The inclusion of a SUDS feature diversifies habitats and provides further potential habitat type that does not currently exist on site (save for the 'dry' depression).

7.4.150 As a further enhancement, new bat boxes (see **Appendix 7.4**) will be provided on suitable retained trees within the Application Site and on new buildings. These will provide new roosting opportunities for bats.

7.4.151 Post mitigation and enhancements, effects are **beneficial** at the **European level** and are of **minor-moderate significance**.

Birds

7.4.152 As an enhancement, new bird next boxes will be provided on suitable retained trees within the Application site, within retained areas of open space and on new buildings. These will provide new nesting opportunities for a range of birds. Using nest boxes of varying designs (see **Appendix 7.5**) will maximise the species complement attracted to the Application Site and, where possible, could be tailored to provide opportunities for Red Listed / Priority Species, e.g. House Sparrow, that are known from the Application Site.

7.4.153 Post mitigation and enhancements, effects are **beneficial** at the **site level** and are of **minor significance**.

Invertebrates

7.4.154 The planting of new native trees, hedgerows, and the creation of new areas of species-rich, wildflower, and tussocky grassland within the Application Site, will provide enhanced habitat for a range of invertebrates. The retention of mature Oak and Ash trees, as well as the inclusion of species such as Oak, Beech, Birch, Lime, *Salix* sp., within the tree / hedgerow planting and the creation of new areas of wildflower grassland will provide new and enhanced larval foodplants for Priority Species of butterfly and moth known from the local area.

7.4.155 As an enhancement, the creation of stumperies / log piles within areas of open space will benefit a range of saproxylic species. The implementation of other measures recommended above would also likely provide knock-on benefits for invertebrates, e.g. through tree planting and use of planting of wildlife benefit.

7.4.156 Post enhancements, effects are **beneficial** at the **local level** and are of **minor significance**.

7.5 CUMULATIVE AND IN-COMBINATION EFFECT

7.5.1 There are not deemed to be any significant cumulative effects resulting from the Proposed Development of the Application Site. The measures for the Application Site have been designed to offset any perceived effects such that there are no adverse residual effects and thus negating any accumulation of significant adverse effects.

7.6 SUMMARY

Introduction

7.6.1 This ES chapter sets out any potential effects arising from the Proposed Development, together with any required strategies to minimise or compensate for those effects.

Application Site Characteristics

7.6.2 The Application Site is situated on the eastern side of Cheltenham, Gloucestershire (see **Figure 7.1**). The western boundary is bordered by a public footpath with existing residential development beyond. Residential development also lies to the north and south (beyond Harp Hill). New residential development is currently in construction to the north-east and a covered reservoir is located to the east with open countryside beyond.

7.6.3 The Application Site itself consists of six semi-improved grassland fields separated by hedgerows and trees (see **Figure 7.2**). There are six buildings in the north of the Application Site, with associated amenity planning, neutral grassland, hedgerows and trees.

Baseline Conditions

Statutory Designated Sites

7.6.4 There are no statutory designated sites of nature conservation interest within or immediately adjacent to the Application Site. The nearest statutory designation is Cleeve Common Site of Special Scientific Interest (SSSI) that lies approximately 2.7km north-east of the Application Site and is separated by residential development and extensive areas of open countryside and agricultural land.

7.6.5 The nearest European designation is Dixton Wood Special Area of Conservation (SAC), also notified as a SSSI, that lies around 8.6km to the north of the Application Site and is separated by minor and major roads, residential development and extensive areas of open countryside and agricultural land.

7.6.6 In addition, there are three other SSSI's (Puckham Woods, Lineover Wood and Leckhampton Hill and Charlton Kings Common SSSI) located within 5km of the Application Site and one other SAC (Cotswold Beechwoods SAC), which is also designated as a National Nature Reserve (NNR) and a SSSI, within 9km of the Application Site.

Non-statutory Designated Sites

7.6.7 There are no non-statutory designated sites of nature conservation interest within or immediately adjacent to the Application Site. The nearest non-statutory site is Glenfall Wood Key Wildlife Site (KWS) located approximately 0.8km southeast of the Application Site, and is separated from the Application Site by roads and agricultural land.

Habitats

7.6.8 The vast majority of the Application Site comprises semi-improved grassland fields (F2-F7), separated by a network of hedgerows and trees. Other habitats within the Application Site include areas of amenity grassland (F1) and planting, a dry depression, areas of ruderal vegetation and ruderal-dominated grassland, as well as areas of scattered scrub, Bramble scrub, cleared Bramble scrub and cleared ground. In addition, there are six buildings (B2-B7) in the north of the Application Site with areas of hardstanding associated with these buildings. Building B1 was subsequently demolished in October 2019 under planning consent 19/01610/DEMCON, after evening bat emergence and dawn bat re-entry surveys undertaken in June, July and September 2019 confirmed no bat roosts were present.

7.6.9 The majority of the habitats are considered to be of low ecological value. Habitats of greater ecological value in the context of the Application Site include areas of greater botanical interest within two grassland fields (F2 and F3) as well as hedgerows and trees.

Fauna

7.6.10 General observations were made throughout Ecology Solutions' surveys of any faunal use of the Application Site with attention paid to the potential presence of protected species. Specific surveys were also undertaken with regard to Badgers, bats, breeding birds and reptiles.

7.6.11 During the surveys undertaken, no evidence of Badgers and reptiles was recorded within the Application Site, although it is considered the habitats present offer some suitable opportunities for foraging Badgers.

7.6.12 Overall, the vast majority of bat activity was recorded from Common Pipistrelle, with less activity recorded from *Myotis* sp., Lesser Horseshoe bats, Soprano Pipistrelle, *Nyctalus* sp., Brown Long-eared, Nathusius' Pipistrelle and Barbastelle. Only occasional and low levels of activity was recorded from Serotine. In addition, there is one mature Oak tree with an occasionally used summer day roost used by a single Noctule bat in the north of the Application Site (see **Figure 7.3**).

7.6.13 In general, bats use most of the hedgerows within the Application Site to varying degrees throughout the year with areas of greater registrations at the crossing point of H3 and H1 along hedgerows and trees associated with the demolished farm building B1, along H7-H11, along the northern section of H9 (just before crossing point of H9 and H12), at the crossing point of H2 and H2a. Lower numbers of bat registrations were recorded along H1, H2a, H5, H6 and along the northwestern (H2a and H3), northeastern and eastern boundary of the Application Site (see **Figures 7.4-7.11**).

7.6.14 It is considered that the Application Site supports an unremarkable ornithological assemblage (see **Figures 7.12-7.14**), with low numbers of notable breeding bird species, including House Sparrow, Willow Tit, Dunnock and Bullfinch.

Likely Significant Effects

Designated Sites

Statutory Designated Sites

7.6.15 The nearest statutory designated site is Cleeve Common SSSI (located approximately 2.7km north-east of the Application Site), which is well separated from the Application Site. The Impact Risk Zones (IRZ) from the Cleeve Common SSSI partially cover the Application Site and have identified the potential effects on this SSSI from Proposed Development to be from 'any residential developments with a total net gain in residential units.'

7.6.16 The nearest European designation is Dixton Wood SAC/SSSI, which is well separated from the Application site and none of its IRZs extend into the Application Site. Puckham Woods SSSI, Lineover Wood SSSI and Leckhampton Hill and Charlton Kings Common SSSI are all well separated from the application Site and none of their IRZ's extend into the Application Site. As such, it is considered there would be no likely significant effects, either alone or in combination with other plans or projects, during either the construction or operational phases.

7.6.17 The Cotswold Beechwoods SAC/NNR/SSSI is well separated from the Application Site, however it's IRZ's cover the Application Site and have identified the potential effects on this SSSI from Proposed Development to be from 'any residential developments with a total net gain in residential units'. A Briefing Note (see **Appendix 7.3**) has been produced to provide information required for a Habitat Regulation Assessment (HRA) for the Cotswold Beechwoods SAC. As concluded within this Briefing Note, it is considered that there would be no significant direct / indirect effects from the Proposed Development alone or in combination with other developments on the Cotswold Beechwoods SAC.

7.6.18 Given the presence of alternative recreation resources, the same principles apply for the Cleeve Common SSSI as set out in the HRA for the Cotswold Beechwoods SAC. Therefore, it is considered that there would be no significant direct / indirect effects on the Cleeve Common SSSI.

Non-statutory Designated Sites

7.6.19 It is considered there would be no likely significant effects on the Glenfall Wood KWS, either alone or in combination with other plans or projects, during either the construction or operational phases.

Habitats

7.6.20 The Development Proposals will result in the loss / partial loss or change of use of the habitats present within the Application Site during the construction phase, while no additional adverse effects are considered to be relevant during the operational phase on the majority of the retained habitats.

7.6.21 Although there is likely to be recreational pressure on the retained semi-improved grassland at the operational phase, it is not considered that there will be any significant adverse effects.

Fauna

7.6.22 Effects during the construction phase are considered to be short-term disturbance to foraging and commuting Badgers, and potential disturbance from

construction traffic; a reduction in suitable foraging and navigational opportunities for bats, although the vast majority of the hedgerows and trees will be retained within the Proposed Development, and potential disturbance from lighting on foraging and commuting bats during the construction phase; and loss of some foraging and nesting habitat for birds to the Proposed Development, and potential for killing or injury of birds and / or damage or destruction of nests during clearance of vegetation.

7.6.23 During the operational phase, it is not considered there will be any significant adverse effects on fauna, other than potential disturbance from lighting to foraging and commuting bats.

Mitigation and Enhancements

Designated Sites

Statutory Designated Sites

7.6.24 Although no mitigation is deemed to be required Homeowner Information Packs (HIPs) will be included as part of the proposed development.

Non-statutory Designated Sites

7.6.25 None relevant.

Habitats

7.6.26 New areas of species-rich grassland will be sown / oversown using a native species-rich grassland seed mixture (such as Emorsgate's Flowering Lawn Mixture EL1 or Standard General Purpose Meadow Mixture EM2) and be subject to a suitable management regime to increase the floristic diversity of the Application Site, which will compensate for the loss of small areas of amenity grassland. The planting of new native shrubs throughout the Proposed Development will also compensate for the loss of small patches of amenity planting. In order to compensate for the loss of the areas of semi-improved grassland, including the small areas with greater botanical interest, the retained grassland in the north of the Application Site will be oversown with a species-rich native seed mixture (such as Emorsgate's EM2 Standard General Purpose Meadow Mixture). In addition, as an enhancement new grassland will be created around the new SUDS feature and sown / oversown using a native species-rich grassland seed mixture (such as Emorsgate's Standard General Purpose Meadow Mixture EM2).

7.6.27 Retained and newly created areas of species-rich grassland will be subject to a suitable management regime to increase its floristic diversity. This could be secured by way of a planning condition requiring a Landscape and Ecological Management Plan (LEMP).

7.6.28 Measures will be put in place to ensure that retained hedgerows and trees and sections of hedgerows are safeguarded from direct effects during the construction phase, e.g. fenced-off during construction to prevent encroachment into these areas by construction machinery. No construction machinery or materials will be stored within these fenced areas at any point during the development. This could be secured by way of planning condition requiring the production of a Construction Environmental Management Plan (CEMP).

7.6.29 The creation of new areas of landscape planting within the Application Site, will be planted using a diverse mix of native species wherever possible, or species of benefit to wildlife, which will compensate for the loss of areas of scattered scrub, Bramble scrub, ruderal vegetation and ruderal-dominated grassland.

7.6.30 As an enhancement new hedgerow / tree planting of a length / area greater than that lost is to be included within the Proposed Development. The new planting will be based around native species of local provenance.

Fauna

7.6.31 Green links will be provided throughout the Application Site in the form of retained and new native hedgerows and features akin to a woodland ride within new block planting and along green corridors.

7.6.32 The creation of new species-rich grassland and planting of new native shrubs and hedgerows will provide enhanced foraging opportunities for Badgers. The planting of new native hedgerows and trees, and the creation of features akin to a woodland ride, as well as the creation of a species-rich grassland within the areas of open space will mitigate for the loss of areas of bat foraging habitat.

7.6.33 Where lighting is necessary during construction and operation, any potential light spillage will be reduced, as set out below, and directed away from features that offer suitable foraging opportunities for bats. A sympathetic lighting regime will also be incorporated into the Proposed Development to minimise light spillage into key areas, such as the features akin to a woodland ride within new block planting, retained and new hedgerows / trees and areas of species-rich grassland, to maintain foraging and navigation opportunities in these areas.

7.6.34 The Oak tree (T1) with an occasionally used summer day roost for Noctule bat and the other trees with potential to support roosting bats will be buffered from the Proposed Development and retained in dark corridors (as part of any detailed lighting scheme) to allow continued movement by bats through the Application Site

7.6.35 In order to safeguard any nesting bird species within the Application Site, the clearance of any hedgerows, trees and scrub will be undertaken outside of the bird breeding season (March-July inclusive). Should this not be possible potential nesting habitat is subject to a check survey immediately prior to its removal by an experienced ecologist. Should any nesting birds be identified then the nest should be fully safeguarded in situ and subject to a disturbance buffer of at least 5 metres and only removed once it has been confirmed any fledglings have left the nest.

7.6.36 The provision of new native hedgerow and tree planting will mitigate for the loss of small areas of bird nesting habitat, while the creation of species-rich grassland in the north of the Application Site will mitigate for the loss of foraging habitat and provide enhanced foraging opportunities over the existing situation.

7.6.37 The new SUDS feature will diversify existing habitats within the Application Site by creating a habitat type that does not currently exist (other than the one 'dry' depression which is also to be retained). The planting of native species of benefit to wildlife, such as fruit-bearing trees, will be an enhancement and will provide additional seasonal foraging opportunities for Badgers and birds.

7.6.38 As an enhancement, bat boxes (see **Appendix 7.4**) are to be erected on retained semi-mature / mature trees or new buildings to provide new roosting opportunities for bats. Also, the new SUDS feature will diversify habitats present and provide enhanced foraging opportunities for bats, including Common Pipistrelle, Soprano Pipistrelle Nathusius' Pipistrelle, *Nyctalus* sp. and Serotine.

7.6.39 As an enhancement, nest boxes for birds will be placed on suitable retained / new trees and /or buildings. These will provide further nesting opportunities and will be of particular value whilst the new areas of landscape planting mature. Using nest boxes

of varying designs would maximise the species complement attracted to the Application Site, and where possible these could be tailored to provide opportunities for Red Listed / Priority Species e.g. House Sparrow, known to be present within the Application Site and wider area.

7.6.40 A series of log piles and hibernacula will be included within the areas of open space, associated with the attenuation features and areas of rough grassland, which will provide suitable hibernation / refuge opportunities for invertebrates.

Conclusions

7.6.41 With the mitigation proposed, the Proposed Development would not result in any adverse residual effect on habitats of species of any significance, and there will be no net loss of features of ecological importance.

7.6.42 Where it is considered that there is a reduction in potential habitat for protected species, the development proposals will ensure that these are compensated for by replacement habitat of equal size and greater quality.

7.6.43 Following mitigation and enhancement measures, overall effects are considered to be positive at the site to European level and will ensure no net loss in biodiversity terms.

Table 7.18: Summary of Effects, Mitigation and Residual Effects

Receptor/ Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation/ Enhancement Measures	Residual Effects ****
Construction								
Statutory Sites: SSSI / SAC	None relevant	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Non-statutory Sites: KWS	None relevant	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Amenity Grassland and Amenity Planting	Loss of Habitat	Permanent / direct	Not applicable	Not applicable	Local	Negligible	Creation of new areas of species-rich grassland and native / wildlife beneficial landscape planting	Minor beneficial
Semi-improved grassland	Loss of Habitat	Permanent / direct	Not applicable	Not applicable	Local	Moderate adverse	Oversowing of retained habitat with species-rich wildflower seed mixture and implementation of suitable management regime; creation of new grassland around the new SUDS feature	Minor - moderate beneficial

Receptor/ Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation/ Enhancement Measures	Residual Effects ****
Hedgerow and Trees	Loss to hedgerow network	Permanent / direct	Not applicable	Not applicable	Local	Moderate adverse	Planting new native hedgerows and trees of greater length / area than lost	Moderate beneficial
	Dust (and potential other pollution) to retained hedgerows and trees	Temporary / direct	Not applicable	Not applicable	Local	Moderate adverse	Safeguarding retained hedgerows and trees	Moderate beneficial
Dry Depression, Ruderal Vegetation and Ruder-dominated Grassland	Loss of ruderal vegetation and ruder-dominated grassland	Permanent / direct	Not applicable	Not applicable	Local	Negligible	Creation of new SUDS feature with native new aquatic vegetation planting and new species-rich grassland and native scrub / hedgerow planting	Minor beneficial
Scattered Scrub, Bramble Scrub, Cleared Bramble Scrub	Loss of habitat	Permanent / direct	Not applicable	Not applicable	Local	Negligible	New native / wildlife beneficial shrub planting	Minor beneficial
Buildings and Hardstanding	None relevant	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Cleared Ground	None relevant	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Badgers	Loss of potential foraging grounds	Permanent / direct	Not applicable	Not applicable	County	Minor adverse	Creation of new foraging grounds	Neutral

Receptor/ Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation/ Enhancement Measures	Residual Effects ****
	Potential disturbance from construction traffic	Temporary / direct	Not applicable	Not applicable	County	Minor adverse	Protective measures and checks of spoil mounds for Badger presence	Neutral
Bats	Loss / severance to hedgerow network that offer suitable foraging and commuting opportunities	Permanent / direct	Not applicable	Not applicable	European	Minor - moderate adverse	New planting and creation of new foraging habitats; creation of features akin to a woodland ride; Provision of new bat boxes	Minor - moderate beneficial
	Potential disturbance from lighting	Temporary / Permanent / direct	Not applicable	Not applicable	European	Minor – moderate adverse	Sensitive lighting during construction to ensure dark corridors for bats	Minor - moderate beneficial
Other Mammals	Loss of suitable foraging habitat for a range of mammals	Permanent / direct	Not applicable	Not applicable	Local	Negligible	Creation of new habitats, including wildflower grassland, hedgerow / tree / scrub planting, and SUDS feature	Neutral
Birds	Loss of suitable foraging and nesting habitat	Permanent / direct	Not applicable	Not applicable	Local	Minor adverse	New planting to provide new foraging and nesting habitat. Provision of new nest boxes	Minor beneficial

	Potential for killing or injury and / or damage or destruction of nests during clearance of vegetation	Temporary / direct	Not applicable	Not applicable	Local	Minor adverse	Clearance of vegetation out bird nesting season	Neutral
Invertebrates	Loss of suitable habitat	Permanent / direct	Not applicable	Not applicable	Local	Negligible	Creation of new habitats, including wildflower grassland, hedgerow / tree / scrub planting, and SUDS feature	Minor beneficial
Operation								
Statutory Sites	None relevant	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Provision of Home Owner Information Packs (HIP)	Not applicable
Non-statutory Sites	None relevant	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Semi-improved Grassland	Potential increased recreational pressure	Permanent / direct	Not applicable	Not applicable	Local	Negligible	Retained and newly created / enhanced grasslands will be subject to a suitable management regime to increase the floristic diversity.	Minor-moderate beneficial
Other Habitats	None relevant	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

Bats	Potential disturbance from lighting	Permanent / direct	Not applicable	Not applicable	European	Minor – Moderate adverse	Sensitive lighting during operation to ensure dark corridors for bats	Moderate beneficial
Other Fauna	None relevant	Not Applicable	Not Applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Cumulative and In-combination								
Statutory and non-statutory sites	None relevant	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Habitats	None relevant	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Fauna	None relevant	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

Notes:

* Enter either: Permanent or Temporary / Direct or Indirect

** Only enter a value where a sensitivity v magnitude effects has been used – otherwise 'Not Applicable'

*** Enter either: International, European, United Kingdom, Regional, County, Borough/District or Local

**** Enter either: Major / Moderate / Minor / Negligible AND state whether Beneficial or Adverse (unless negligible)

8 CULTURAL HERITAGE

8.1 INTRODUCTION

8.1.1 This chapter provides an assessment of archaeological and built heritage features, collectively referred to as cultural heritage assets, within the Application Site and a 1km study area surrounding it. Cultural heritage assets are defined as a building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in the planning process.

8.1.2 This chapter presents a description of heritage baseline conditions, considers the potential effects of development on these assets and presents appropriate mitigation measures where these are necessary.

8.2 ASSESSMENT APPROACH

Methodology

8.2.1 Previous and recent studies implemented within the Application Site have been used to inform the preparation of this ES Chapter. These, alongside relevant plans, comprise:

- Built Heritage Statement (**Appendix 8.1**);
- Archaeological Desk-Based Statement (**Appendix 8.2**);
- Geophysical Survey (**Appendix 8.3**); and
- Trial trench evaluation (**Appendix 8.4**).

8.2.2 The determination of the magnitude of change is based on the level of effect of the Proposed Development upon cultural heritage resources e.g. land take or excavation, ground disturbance and compaction, alteration to views or experience; and the current state of survival/condition of the asset e.g. the nature of past development or management effects.

8.2.3 Development impacts can be characterised as to whether they would be:

- Direct or Indirect;
- Short or Long Term;
- Reversible or Irreversible; and/or
- Cumulative.

8.2.4 The magnitude of impact is assessed by taking into consideration the extent/proportion of the site/asset affected, its type, its survival/condition, its fragility/vulnerability and its potential amenity value. In considering the above factors, the criteria for assessing the magnitude of predicted change on cultural heritage resources are given in **Table 8.1**.

8.2.5 Please note that identified levels of harm for each built heritage resource set out in the baseline section of the Built Heritage Statement (**Appendix 8.1**) relates to the magnitude of impact in this ES Chapter and not significance of effect.

Table 8.1: Criteria for Appraisal of Magnitude of Effect on Heritage Resources

Magnitude	Definition
High	Total loss or major/substantial alteration to key elements/features of the baseline (pre-Development) conditions such that the post-Development character/composition/attributes will be fundamentally changed.
Medium	Loss or alteration to one or more key elements/features of the baseline conditions such that post-Development character/composition/attributes of the baseline will be materially changed.
Low	A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the baseline condition will be similar to the pre-Development circumstances/situation.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.

8.2.6 The sensitivity of the archaeological/built heritage resource will depend on factors such as the condition of the site/asset and the perceived heritage value/importance of the site/asset. The sensitivity of the asset (cultural heritage resource) is defined by its importance in terms of national, regional or local statutory or non-statutory protection and grading of the asset. Determination of the significance of heritage resources takes account of existing statutory designations and, for non-designated heritage resources, professional judgement and Historic England criteria relating to local listing. For archaeology, the Secretary of State's non-statutory criteria for assessing the national importance of archaeological monuments provides relevant criteria to assist in this process, along with professional judgement.

Table 8.2: Criteria for Assessing Sensitivity of Heritage Resources

Sensitivity	Definition
High	- World Heritage Sites - Scheduled Monuments and archaeological sites of demonstrable schedulable quality and importance - Protected Wreck Sites - Registered Battlefields - Grade I and II* listed buildings - Grade I and II* registered parks and gardens - Grade II listed buildings - Conservation areas
Medium	- Local Authority designated archaeological or built heritage assets and their settings - Grade II registered parks and gardens - Undesignated archaeological or built heritage assets of demonstrable regional importance
Low	- Archaeological or built heritage assets with specific and substantial importance to local interest groups - Sites whose importance is limited by poor preservation and poor survival of contextual associations
Negligible	- Sites with no surviving archaeological or historical component

8.2.7 The sensitivity of the receiving environment, together with the magnitude of change, defines the significance of the effect as set out in **Table 8.3**. The effect outlined below represents the effect without mitigation. Impacts of Major adverse and Moderate Adverse significance of effect are considered to equate to significant impacts in the context of the EIA Regulations. Assessment of the effect of development on the setting of heritage assets follows GPA3: The Setting of Heritage Assets (Second Edition) guidance issued by Historic England in December 2017.

8.2.8 The significance criteria are generally described as follows:

Table 8.3: Criteria for Assessing Significance of Effect

Magnitude of Change	**Sensitivity of Receptor**				
		High	**Medium**	**Low**	**Negligible**
	High	Major	Major	Moderate to Minor	Negligible
	Medium	Major	Moderate	Minor to Moderate	Negligible
	Low	Moderate to Minor	Minor to Moderate	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Legislative and Policy Framework

National Planning Policy Framework

8.2.9 In March 2012, the government published the National Planning Policy Framework (NPPF), which was subsequently updated in February 2019. The NPPF is supported by the National Planning Practice Guidance (NPPG), which was published online 6th March 2014 and last updated 22 February 2018 (https://www.gov.uk/guidance/conserving-and-enhancing-the-historic-environment).

8.2.10 The NPPF and NPPG are additionally supported by three Good Practice Advice (GPA) documents published by Historic England: GPA 1: The Historic Environment in Local Plans; GPA 2: Managing Significance in Decision-Taking in the Historic Environment (both published March 2015). The second edition of GPA3: The Setting of Heritage Assets was published in December 2017.

8.2.11 Section 16 of the NPPF, entitled 'Conserving and enhancing the historic environment' provides guidance for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 16 of the NPPF can be summarised as seeking the:

- Delivery of sustainable development;
- Understanding the wider social, cultural, economic and environmental benefits brought by the conservation of the historic environment;
- Conservation of England's heritage assets in a manner appropriate to their significance; and
- Recognition that heritage makes to our knowledge and understanding of the past.

8.2.12 Section 16 of the NPPF recognises that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term. Paragraph 189 states that planning decisions should be based on the significance of the

heritage asset and that level of detail supplied by an applicant should be proportionate to the importance of the asset and should be no more than sufficient to review the potential impact of the proposal upon the significance of that asset.

8.2.13 Heritage Assets are defined in Annex 2 of the NPPF as: a building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in planning decisions. They include designated heritage assets (as defined in the NPPF) and assets identified by the local planning authority during the process of decision-making or through the plan-making process.

8.2.14 Annex 2 also defines Archaeological Interest as a heritage asset which holds or potentially could hold evidence of past human activity worthy of expert investigation at some point.

8.2.15 A Nationally Important Designated Heritage Asset comprises a: World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area.

8.2.16 Significance is defined as: The value of a heritage asset to this and future generations because of its heritage interest. This interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.

8.2.17 Setting is defined as: The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.

8.2.18 In short, government policy provides a framework which:

- Protects nationally important designated Heritage Assets;
- Protects the settings of such designations;
- In appropriate circumstances seeks adequate information (from desk based assessment and field evaluation where necessary) to enable informed decisions;
- Provides for the excavation and investigation of sites not significant enough to merit in-situ preservation.

8.2.19 The NPPG reiterates that the conservation of heritage assets in a manner appropriate to their significance is a core planning principle, requiring a flexible and thoughtful approach. Furthermore, it highlights that neglect and decay of heritage assets is best addressed through ensuring they remain in active use that is consistent with their conservation. Importantly, the guidance states that if complete, or partial loss of a heritage asset is justified, the aim should then be to capture and record the evidence of the asset's significance and make the interpretation publicly available.

8.2.20 Key elements of the guidance relate to assessing harm. An important consideration should be whether the proposed works adversely affect a key element of the heritage asset's special architectural or historic interest. Additionally, it is the degree of harm, rather than the scale of development, that is to be assessed. The level of 'substantial harm' is considered to be a high bar that may not arise in many cases. Essentially, whether a proposal causes substantial harm will be a judgment for the decision maker, having regard to the circumstances of the case and the NPPF. Importantly, harm may arise from works to the asset or from development within its setting. Setting is defined as the surroundings in which an asset is experienced and may be more extensive than the curtilage. A thorough assessment of the impact of proposals upon setting needs to take into account, and be proportionate to, the significance of the

heritage asset and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it.

8.2.21 In considering any planning application for development, the planning authority will be mindful of the framework set by government policy, in this instance the NPPF, by current Development Plan Policy and by other material considerations.

Local Planning Policy

8.2.22 The Joint Core Strategy (JCS) is a partnership between Gloucester City Council, Cheltenham Borough Council and Tewkesbury Borough Council. The JCS is a co-ordinated strategic development plan that sets out how the area will develop during the period up to 2031. The JCS includes the following policy relating to the historic environment:

> **'POLICY SD8 – Historic Environment**
>
> **1 The built, natural and cultural heritage of Gloucester City, Cheltenham Town, Tewkesbury Town, smaller historic settlements and the wider countryside will continue to be valued and promoted for their important contribution to local identity, quality of life and the economy;**
>
> **2 Development should make a positive contribution to local character and distinctiveness, having regard to valued and distinctive elements of the historic environment;**
>
> **3 Designated and undesignated heritage assets and their settings will be conserved and enhanced as appropriate to their significance, and for their important contribution to local character, distinctiveness and sense of place. Consideration will also be given to the contribution made by heritage assets to supporting sustainable communities and the local economy. Development should aim to sustain and enhance the significance of heritage assets and put them to viable uses consistent with their conservation whilst improving accessibility where appropriate;**
>
> **4 Proposals that will secure the future conservation and maintenance of heritage assets and their settings that are at risk through neglect, decay or other threats will be encouraged. Proposals that will bring vacant or derelict heritage assets back into appropriate use will also be encouraged; and**
>
> **5 Development proposals at strategic allocations must have regard to the findings and recommendations of the JCS Historic Environment Assessment (or any subsequent revision) demonstrating that the potential impacts on heritage assets and appropriate mitigation measures have been addressed.'**

8.2.23 The Cheltenham Borough Council Local Plan Second Review was adopted in June 2006 and replaced the First Review of the Local Plan (1997). There are no saved policies which relate to the setting of listed buildings, with only policies relating to direct work to a listed building or within a Conservation Area. These are therefore not relevant in this

case. The currently adopted local plan contains the following saved policies relating to archaeology:

> **'POLICY BE19 – Nationally Important Archaeological remains**
>
> **There will be presumption in favour of the physical preservation in situ of nationally important archaeological remains and their settings.'**
>
> **'POLICY BE20 – Archaeological Remains of Local Importance**
>
> **Development affecting sites of local archaeological importance will be permitted where the remains are preserved (note):**
>
> **a) In situ; or**
>
> **b) Only if this is not feasible, by record.**
>
> **Where remains are to be preserved in situ, measures adequate to ensure their protection during construction will be required.**
>
> **Note – The preservation in situ or the excavation and recording of remains prior to and during development should be supervised or undertaken by a competent archaeological organisation.'**

Legislative Context

8.2.24 National legislation regarding archaeology, including scheduled monuments, is contained in the Ancient Monuments and Archaeological Areas Act 1979, amended by the National Heritage Act 1983 and 2002, and updated in April 2014. Where any development may affect designated built heritage assets, there is a legislative framework to ensure proposed works are developed and considered with due regard to their impact on the historic environment. This extends from primary legislation under the Planning (Listed Buildings and Conservation Areas) Act 1990.

Scoping Criteria

8.2.25 The Built Heritage Statement (**Appendix 8.1**) identified a number of built heritage assets that had the potential to be affected by the Proposed Development. Of these, a number have been scoped out of this assessment as it is considered that there will no effect on the assets. In agreement with the Local Authority, the built heritage assets which are to be considered are:

- No 1 Reservoir (Grade II listed) (HB1)
- No 2 Reservoir (Grade II listed) (HB2)
- Pavilion at Hewlett's Reservoir (Grade II listed) (HB3)
- Gates, Gatepiers and Boundary Walls at Hewlett's Reservoir (Grade II listed) (HB4)
- Stone Lodge at Hewlett's Reservoir (non-designated heritage asset) (HB5)
- Agricultural Buildings at Oakley Farm (non-designated heritage asset) (HB6)

8.2.26 Each of these will be considered in relation to both the Construction Phase and the Operational Phase of the Proposed Development.

8.2.27 One scheduled monument, Battledown Camp (1002083), has been identified in close proximity to the Application Site, 175m to the south.

8.2.28 The archaeological desk-based assessment (**Appendix 8.2**) did not identify any specific archaeological features other than ridge and furrow cultivation earthworks which covered much of the site. The assessment concluded there was a low-moderate potential for the presence of Prehistoric and Roman periods to be present within the site.

8.2.29 The geophysical survey (**Appendix 8.3**), did not identify any definite archaeological features. A few linear anomalies of uncertain origin were mapped, along with former field boundaries and ridge and furrow cultivation.

8.2.30 The archaeological evaluation (**Appendix 8.4**) has recorded a limited number of archaeological features in the 26 trenches excavated and recorded.

8.2.31 The archaeological assets to be considered are as follows:

- Battledown Camp (ARCH1)
- A single probable Prehistoric feature (ARCH2)
- Three small pits, undated (ARCH3)
- Ditch, probably Post-Medieval (ARCH4)
- Shallow linear feature, probably a furrow (ARCH5)

8.2.32 These identified archaeological assets will be considered in relation to both the Construction Phase and the Operational Phase of development.

8.2.33 The scope of the archaeological assessment, and the general significance of the assets in question have been discussed with the Local Planning Authority archaeological advisor.

Limitations to the Assessment

8.2.34 Several of the built heritage assets were not visible from publicly accessible locations, for example the Reservoirs, meaning that obtaining views of the resources were challenging. As such, a detailed assessment of the architectural significance was reliant upon available views and any available resources such as listing descriptions.

8.3 BASELINE CONDITIONS

Site Description and Context

8.3.1 The Application Site is raised up on high land overlooking much of Cheltenham and therefore there is a large quantity of designated heritage assets which can be seen from the Application Site. In most cases these are just read as part of the general roof-scape of Cheltenham and it is not possible from the Application Site to discern their significance. Equally, from these assets there is no appreciation of the Application Site and the Application Site does not make any contribution to the significance of the assets. There are some buildings which are considered to be non-designated heritage assets within the Application Site, and these have been considered below.

8.3.2 The location of the Application Site on a north-facing slope makes it an unattractive place for prehistoric/historic settlement. The recorded presence of ridge and furrow cultivation earthworks across the site (from aerial photographs) indicates that the Application Site has been used as agricultural land since at least the Post-Medieval period, and possibly the Medieval period. A map regression exercise confirmed that the Application Site has been agricultural land since the earliest mapping (1811) up to the present day.

8.3.3 The archaeological background in relation to earlier periods indicates a general spread of Prehistoric features across the local landscape, including settlement evidence at the base of the hill on which the Application Site stands. This pattern is repeated in the Roman period. The archaeological potential of the site has been identified as resting in the late Prehistoric and Roman periods.

Baseline Survey Information

Built Heritage

8.3.4 The Built Heritage Statement has identified a number of built heritage resources that may be affected by the Proposed Development. The location of these built heritage resources is shown in **Figure 8.1**, with further information contained within the Built Heritage Statement in **Appendix 8.1**.

8.3.5 No 1 Reservoir (HB1) is a Grade II listed building (NHL: 1423571). It is a large underground reservoir which was constructed in 1824. Its significance is primarily derived from its technological interest, with it representing the earliest known surviving example of an underground reservoir. It also has a high level of architectural interest, historic interest, and associative value, having been designed by James Walker, one of the most notable civil engineers of the nineteenth century. The Application Site is immediately adjacent to the asset and provides a degree of separation between the asset and Cheltenham town, as well as providing a rural character. Views of the asset are largely blocked from the Application Site due to it being an underground resource, and by the separately listed walls. Contribution made by the Application Site is therefore secondary to the importance of the listed building. HB1 is considered to be a heritage resource of high sensitivity on account of its Grade II listed status.

8.3.6 No 2 Reservoir (HB2) is a Grade II listed building (NHL 1423572) which dates to 1839. It was added to increase the reservoir capacity of the complex. Like No 1 Reservoir the asset has technological interest, having been designed by James Walker, a distinguished civil engineer of the nineteenth century and has a high degree of historical and architectural value. The asset has the same immediate and wider setting as the No 1 Reservoir and as such the Application Site contributes in the same way to the asset, with this contribution being secondary. HB2 is a heritage resource of high sensitivity, as demonstrated by its designation as a Grade II listed building.

8.3.7 The Pavilion at Hewlett's Reservoir (HB3) dates to the mid-nineteenth century, and was possibly originally a valve house but is now purely a decorative folly. The building principally derives its significance from its architectural interest, in addition to its aesthetic and historic values. The Application Site forms a part of the open landscape surrounding the asset and therefore forms a buffer between the reservoir and the rest of the built-up core of Cheltenham. It also provides a feeling of rurality which makes the asset stand out in its isolated setting. Despite this, the principal understanding of the asset comes from its architectural and historic qualities, and the contribution made by the Application Site to the importance of the asset is secondary. HB3 is a heritage resource of high sensitivity, demonstrated by its designation as a Grade II listed building.

8.3.8 The Gates, Gatepiers and Boundary Walls at Hewlett's Reservoir (HB4) are separately Grade II listed. The gate piers and gates date to 1824 with the flanking walls dating to 1824 and the 1850s. The significance of the asset is primarily derived from its architectural interest, as well as the asset sharing group value with the rest of the assets which form the complex of buildings at Hewlett's Reservoir. The Application Site forms a part of the wider open landscape which surrounds the walls and provides rural character to the asset, providing a degree of secondary contribution to the importance of the

asset. HB4 is considered to be a heritage resource of high sensitivity on account of its Grade II listed status.

8.3.9 Stone Lodge (HB5) is a non-designated heritage asset which backs on to the Application Site. It is largely not visible from the Application Site, with only the rear elevation visible. The significance of the asset is principally derived from the group value that it shares with the listed buildings discussed above. There is some limited architectural value in the building with it being reminiscent of a lodge of the early-mid nineteenth century. The Application Site contributes to the asset through providing a rural setting for the building, although this is limited, and from the Application Site the value of the building is not easily discernible. HB5 is a heritage asset of low sensitivity as it is considered to be of local importance.

8.3.10 There is a cluster of Agricultural Buildings (HB6) located at the northern extent of the Application Site which appear on the first edition Ordnance Survey Map which are considered to be worthy of non-designated heritage asset status. They are in a poor condition and have not been used for some time. The significance of these building is principally derived from their architectural and historical value in demonstrating agricultural practices of the nineteenth century. There is some aesthetic value which is diminished by the poor state of repair of the buildings. The Application Site is within the immediate setting of these assets and places them within their agricultural and rural context. HB6 is a heritage asset of low sensitivity as it is considered to be of local importance.

Archaeology

8.3.11 The archaeological desk-based report and field investigations have identified a small number of archaeological heritage resources that may be impacted by the proposed development. The location of these archaeological resources is shown in **Figure 8.1**, with further information contained within the desk-based assessment, geophysical survey, and field evaluation reports (**Appendices 8.2**, **8.3**, **8.4**).

8.3.12 Battledown Camp (ARCH1) is a Scheduled Monument approximately 175m south of the Application Site. There is a level of doubt surrounding the archaeological origin of Battledown Camp, but as it remains a designated heritage asset it is treated accordingly in this ES.

8.3.13 The monument comprises the Scheduled site of the remains of a possible Iron Age hillfort, and early 20th century Ordnance Survey records describe the site as a well-defined camp defended to the north and east by a 3m scarp, and to the south by a ditch. The monument's primary setting is formed by its position on a hill-top between Cheltenham to the west and the Cotswold Escarpment to the east. However, as a former hillfort the monument would have functioned as a place of refuge and administration for the wider local landscape.

8.3.14 The Application Site, being located within close proximity to the monument, is considered to lie within the setting of the Scheduled Battledown Camp. The monument, as a hillfort, would have formed a prominent focal point in the landscape during the later Iron Age period, views to and from which would therefore have been important. Any appreciation of the once wider setting that surrounded the monument and within which it could be appreciated as a prominent point of refuge or defence has however since been significantly eroded as a result of later development within its setting. In light of this later development, its current setting can be considered to make no more than a minor contribution to the monument's significance.

8.3.15 Battledown Camp is regarded as an asset of High sensitivity, on account of its designation as a monument of national significance.

8.3.16 The archaeological evaluation (**Appendix 8.4**) has recorded a small number of archaeological features.

8.3.17 ARCH2 comprised a single Prehistoric feature, 0.65m wide and 0.18m deep. The fill of the feature contained a single sherd of Prehistoric pottery. ARCH3 comprised three small pits of up to 0.45m in diameter. One of the features was excavated and was only 0.13m in depth, and the base of the feature was hardened by burning. ARCH4 was a NW-SE aligned ditch, clearly truncating the subsoil and most likely of Post-Medieval date, although no dating evidence was recovered. ARCH5 was a shallow NW-SE aligned feature which had a profile consistent with furrowing, and was interpreted as such.

8.3.18 These features are of low to negligible sensitivity as a result of their low level of preservation, lack of dating evidence, and lack of association with and no clear interpretation as being of structural significance.

8.4 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

Construction

Built Heritage

8.4.1 Sources of impacts on built heritage resources during the Construction Phase of the Proposed Development include:

- Site Clearance;
- New roads and associated infrastructure;
- Increased traffic and Construction noise; and
- Indirect setting impacts

8.4.2 Impact on No 1 and No 2 Reservoir are identical and therefore they have been grouped for the purposes of this chapter. The Construction Phase of the Proposed Development would have no direct impact upon the Grade II listed Reservoirs (HB1 and HB2). Nonetheless effects can arise due to changes to the setting of these assets, in this case through groundworks which would result in increased construction traffic, dust, visual impacts and background noise. These are assets of high sensitivity. The magnitude of impact is deemed to be low, as the setting only makes a limited contribution to the overall significance of the asset. The effect will therefore be of temporary, short-term, minor, adverse significance.

8.4.3 The Construction Phase of the Proposed Development would have no direct impact upon the Grade II listed Pavilion at Hewlett's Reservoir (HB3). Effects will arise despite this due to changes to the setting through increased construction traffic, dust, visual impacts and background noise. The asset is identified as being of High Sensitivity. Whilst the proposed development is in close proximity to the asset, it is considered to result in a low magnitude of impact, due to the Application Site only representing a small contributor to the asset. The significance of effect will therefore be of a temporary, short-term, minor adverse nature.

8.4.4 The Construction Phase of the Proposed Development would have no direct impact on the Grade II listed Gates, Gatepiers and Boundary Walls at Hewlett's Reservoir (HB4). There will nonetheless be effects which arise due to the changes to setting from the increased traffic, dust, visual impacts and background noise. The asset is of high sensitivity due to being a Grade II listed building. The Construction Phase will only result in a low magnitude of impact due to the Application Site being a minor contributor to the importance of the asset. This will therefore result in a temporary, short-term, minor adverse significance of effect.

8.4.5 There will be no direct impact resulting from the Construction Phase of the Proposed Development on the Stone Lodge at Hewlett's Reservoir (HB5). There will be impacts arising from changes to the setting of the asset through increased traffic, dust, visual impacts and background noise. The Construction Phase will result in a low magnitude of impact which when weighed against the low sensitivity of the asset will result in a temporary, short-term, minor adverse significance of effect.

8.4.6 The Construction Phase will result in the total demolition of the non-designated Agricultural Buildings at Oakley Farm (HB6), which will cause a high magnitude of change. Although the asset is only considered to be of low sensitivity, this will still result in a permanent, minor adverse significance of effect.

Archaeology

8.4.7 Sources of impacts on archaeological resources during the Construction Phase include:

- Soil stripping and terracing;
- Cutting of new roads, foundations and associated services;
- General hard and soft landscaping of the Application Site; and
- Indirect setting impacts.

8.4.8 There are no designated archaeological heritage assets (such as Scheduled Monuments) within the Application Site. Therefore, the Proposed Development would have no direct physical impact on any designated archaeological heritage asset during the demolition and Construction Phase of the Proposed Development.

8.4.9 There is one designated archaeological heritage asset within 175m of the Application Site. The Application Site has no intervisibility with the monument, although it is considered that the Application Site lies within the setting of the monument. During the Construction Phase, this setting will be affected by the noise and traffic of the construction process. This activity will be temporary, and will have no appreciable effect on the significance of the monument. As a result, although the asset is of High significance, the Negligible scale of impact will result in a Negligible significance of effect.

8.4.10 All of the other archaeological resources (ARCH2-5 on Figure 8.1) are non-designated heritage assets, and are situated within areas of the Application Site proposed for Proposed Development. The result of this would be the complete removal of these archaeological remains from the Application Site. As such, a major magnitude of impact would arise as a result of the Construction Phase of Proposed Development. However, as the assets are of Negligible to Low sensitivity, the net result will be a Negligible to Minor significance of effect.

Operation

Built Heritage

8.4.11 During the Operational Phase of the Proposed Development, likely effects may arise through changes to the setting through the introduction of built form and additional noise and light pollution. Accordingly, an adverse effect on built heritage resources would result without appropriate mitigation.

8.4.12 The Proposed Development will further erode the wider rural setting of No 1 and No 2 Reservoir (HB1 and HB2) by bringing the suburban edge of Cheltenham closer to the asset. It will also increase light spill which will have an impact on the heritage assets. No 1 and No 2 Reservoir are assets of high sensitivity and the Proposed Development

would result in a low magnitude of effect. This will give rise to a permanent, minor adverse significance of effect.

8.4.13 The Operational Phase of the Proposed Development will bring built development closer to the Grade II listed Pavilion at Hewlett's Reservoir (HB3) which will remove some of the remote experience of the asset and will to some degree reduce the visual impact of the asset within an open rural context. The Pavilion is identified as being of high sensitivity. The low magnitude of effect coupled with the high sensitivity of the asset will therefore cause a permanent long-term, minor adverse significance of effect arising from the erosion of the wider rural landscape.

8.4.14 As with the above listed buildings, the Operational Phase of the proposed development will bring built development closer to the Grade II listed Gates, Gatepiers and Boundary Walls at Hewlett's Reservoir (HB4). This will therefore have an impact on the remote experience of the asset and will reduce its rural context. The walls are considered to be an asset of high sensitivity. As there will be a low magnitude of change arising from the reduction in rural setting, this coupled with the high sensitivity of the asset will result in a permanent, minor, adverse significance of effect.

8.4.15 The Operational Phase of the Proposed Development will bring development in closer proximity to the Stone Lodge at Hewlett's Reservoir, which will reduce its isolation and physical separation from the built edge of Cheltenham. However, the main significance of the property is derived from its connection to the rest of the reservoir structures rather than its setting. The asset is of low sensitivity, and when considered in relation to the low magnitude of impact, this will result in a permanent minor adverse significance of effect.

8.4.16 As the Construction Phase will result in the total demolition of the Agricultural Buildings at Oakley Farm, all effects will be created at that stage. There will be no further effects at the Operational Phase.

Archaeology

8.4.17 The impacts on buried archaeological remains relate to the Development's groundworks and as such are all anticipated to be during the Construction Phase. Therefore, no impacts are anticipated on assets ARCH2 – ARCH5 during the Operational Phase of the Proposed Development.

8.4.18 The setting of the Battledown Camp will be altered by the development, through the introduction of additional built form. The Proposed Development will, however, only add to the existing built form which has already compromised the close setting of the monument. The effect of additional building, not immediately visible from the monument, will be very low. As a result, it is considered that there will be a Negligible magnitude of effect on an asset of High sensitivity, resulting in a Negligible significance of effect.

8.5 MITIGATION AND ENHANCEMENT

Mitigation by Design

8.5.1 The Proposed Development has been designed in a way which will reduce the significance of effect on built heritage assets. A buffer of open space has been left between the listed buildings and non-designated asset at Hewlett's Reservoir to create a degree of separation and to allow for an appreciation of these assets. This mitigation by design has already been taken account of in the assessment of effects above.

8.5.2 Given the very limited scale of effects on the archaeological resource likely to arise from the proposed development, it is not considered that any mitigation by design would be practicable.

Additional Mitigation

8.5.3 The demolition of the Agricultural Buildings at Oakley Farm will see their total loss. To mitigate against this a programme of building recording could be carried out to ensure that their low local interest is recorded. This could be secured by an appropriately worded condition.

8.5.4 The low level of effect on the Battledown Camp Scheduled Monument indicates that no mitigation is required.

8.5.5 The very limited buried archaeological resource identified within the Application Site, and its identified low significance, indicates that further mitigation is not required.

Table 8.4: Mitigation

Ref	Measure to avoid, reduce or manage any adverse effects and/or to deliver beneficial effects	How measure would be secured		
		By Design	By S.106	By Condition
1	Buffer of open Space between Listed Buildings and Proposed Development	X		
2	Programme of Building Recording for demolished Agricultural Buildings at Oakley Farm			X

8.6 CUMULATIVE AND IN-COMBINATION EFFECTS

Built Heritage

8.6.1 The majority of cumulative schemes scoped into this assessment have already been built out, and so effects on built heritage have already been considered in relation to these. There are not, therefore, considered to be any further effects from these. These include application numbers 06/00352/REM, 06/00380/REM, 07/01296/REM, 07/01465/REM. In addition, the parts of application 13/01683/REM which are closest to the Application Site and the listed buildings has also already been completed, and there will therefore be no further effects on built heritage from this than has already been considered in the baseline. Application number 18/01527 will not have any cumulative effects on the built heritage assets discussed above as it is set some distance from these assets and separated by Built Development.

8.6.2 Therefore, the only application that has the potential to have cumulative effects is application number 18/02581. This is located in close proximity to the listed buildings and non-designated heritage asset at Hewlett's Reservoir. The proposals will, as with the Proposed Development, further erode some of the rural setting which surrounds the assets. However, it is considered that this will not increase the significance of effect on the assets concluded above.

Archaeology

8.6.3 As with the built heritage (discussed above), it is not considered that there will be any significant cumulative effect on the setting of the Scheduled Monument. The current, recently completed, and proposed developments will not alter the setting to any significant degree.

8.6.4 Any effects on the buried archaeology will all have taken place during the Construction Phase, and there will be no cumulative effects.

8.7 SUMMARY

Introduction

8.7.1 The Cultural Heritage Assessment considered both above and below-ground heritage resources which would be affected by the Proposed Development and has assessed the significance of the effects that the Proposed Development would have on them.

Baseline Conditions

8.7.2 The Baseline Survey identified six built heritage resources that might be affected by the Construction and Operational phases of Proposed Development. These built heritage assets are:

- No 1 Reservoir (Grade II listed, HB1)
- No 2 Reservoir (Grade II listed, HB2)
- Pavilion at Hewlett's Reservoir (Grade II listed, HB3)
- Gates, Gatepiers and Boundary Walls at Hewlett's Reservoir (Grade II listed, HB4)
- Stone Lodge at Hewlett's Reservoir (Non-designated Heritage Asset, HB5)
- Agricultural Buildings at Oakley Farm (Non-designated Heritage Asset, HB6)

8.7.3 The archaeological assets considered were:

- Battledown Camp (Scheduled Monument, ARCH1)
- A single probable Prehistoric feature (Non-designated asset, ARCH2)
- Three small pits, undated (Non-designated asset, ARCH3)
- Ditch, probably Post-Medieval (Non-designated asset, ARCH4)
- Shallow linear feature, probably a furrow (Non-designated asset, ARCH5)

Likely Significant Effects

8.7.4 There will be a change to the setting of the identified built heritage resources at the Construction Phase. For the listed buildings this will give rise to an effect which will not be significant, as the interest of these assets is derived principally from them being feats of architecture and engineering in the nineteenth century, and from their group value. The effects will all be temporary in nature at the Construction Phase. The effect to the Stone Lodge at Hewlett's Reservoir will not be significant.

8.7.5 The total demolition of the Agricultural Buildings at Oakley Farm during the Construction Phase will affect the assets, however due to the low value of these buildings this will not be significant.

8.7.6 During the Operational Phase the setting of the identified listed buildings will be permanently altered, with the erosion of the rural setting causing an effect to the listed buildings. However, given that the buildings principally derive their value from their architecture and engineering, in addition to their group value, this will not cause a significant effect. As with the Construction Phase of development, the effect to the non-designated Stone Lodge at Hewlett's Reservoir will not be significant. The Operation Phase of the Proposed Development will not cause any further effects to the Agricultural Buildings at Oakley Farm as their loss will be during the Construction Phase.

8.7.7 The setting of the Battledown Camp Scheduled Monument will be affected to a very minor extent during the Construction Phase and will also be affected during the Operational Phase. The extent of this change will, however, be negligible in terms of affecting the significance of the monument.

8.7.8 All effects on the buried archaeological assets will take place during the Construction Phase. Any archaeological assets are likely to be destroyed by the construction process, but the assets are considered to be of low to negligible sensitivity on account of their state of preservation, lack of dating evidence, and lack of interpretation. This will result in a Negligible effect on the known buried archaeological assets.

Mitigation and Enhancement

8.7.9 Mitigation has already been designed into the Proposed Development, with there being a buffer of open space proposed between the listed buildings and the edge of built development. This has already been considered in relation to the effects on the asset.

8.7.10 In addition, a programme of building recording for the Agricultural Buildings at Oakley Farm would record their importance and would help to reduce the effects. This could be secured by an appropriately worded condition.

8.7.11 The low level of effect on the Battledown Camp Scheduled Monument indicates that no mitigation is required.

8.7.12 The very limited buried archaeological resource identified within the Application Site, and its identified low significance, indicates that further mitigation is not required.

Conclusion

8.7.13 Whilst the Proposed Development will have some effect on built heritage assets, this will not result in any significant effects, as in the case of the assets at Hewlett's Reservoir the assets derive their value principally from their architecture rather than their setting. This should not prevent the application being granted. In relation to the total loss of the buildings at Oakley Farm, these assets are of very low value and therefore their loss will not cause a significant effect and should not preclude the Proposed Development of the Application Site.

8.7.14 The proposed development will have a very limited effect on the archaeological resource. The development will make a very limited change to the setting of the Battledown Camp Scheduled Monument, which is already compromised by surrounding built form. As a result, it is considered that the proposed development would have a Negligible effect on the monument. Regarding the buried archaeological resource, this has been identified as being of low value, and although the development will have a Major impact on these assets, the result will be of a negligible effect, and should not preclude the Proposed Development of the Application Site.

Table 8.5: Summary of Effects, Mitigation and Residual Effects

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
Construction								
No 1 Reservoir (HB1)	Erosion of rural setting surrounding the asset	Temporary, Indirect	High	Low	United Kingdom	Minor Adverse	N/A	Minor Adverse
No 2 Reservoir (HB2)	Erosion of rural setting surrounding the asset	Temporary, Indirect	High	Low	United Kingdom	Minor Adverse	N/A	Minor Adverse
Pavilion at Hewlett's Reservoir (HB3)	Erosion of rural setting surrounding the asset	Temporary, Indirect	High	Low	United Kingdom	Minor Adverse	N/A	Minor Adverse
Gates, Gatepiers and Boundary Walls at Hewlett's Reservoir (HB4)	Erosion of rural setting surrounding the asset	Temporary, Indirect	High	Low	United Kingdom	Minor Adverse	N/A	Minor Adverse
Stone Lodge at Hewlett's Reservoir (HB5)	Erosion of rural setting surrounding the asset	Temporary, Indirect	Low	Low	Local	Minor Adverse	N/A	Minor Adverse

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
Agricultural Buildings at Oakley Farm (HB6)	Total Demolition of asset	Permanent, direct	Low	High	Local	Minor Adverse	A Programme of building recording prior to the demolition of the assets	Minor Adverse
Battledown Camp, Scheduled Monument (ARCH1)	Erosion of rural setting surrounding the asset	Temporary, Indirect	High	Low	United Kingdom	Minor Adverse	N/A	Minor Adverse
Probable Prehistoric feature (ARCH2)	Total Destruction of asset	Permanent, direct	Low	High	Local	Negligible to Minor Adverse	None	Negligible
Group of undated pits (ARCH3)	Total Destruction of asset	Permanent, direct	Low	High	Local	Negligible to Minor Adverse	None	Negligible
Post-Medieval(?) ditch (ARCH4)	Total Destruction of asset	Permanent, direct	Low	High	Local	Negligible to Minor Adverse	None	Negligible
Probable furrow (ARCH5)	Total Destruction of asset	Permanent, direct	Low	High	Local	Negligible to Minor Adverse	None	Negligible
Operation								
No 1 Reservoir	Erosion of rural setting surrounding the asset	Permanent, Indirect	High	Low	United Kingdom	Minor Adverse	Provision of buffer of rural space between the edge	Minor Adverse

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
(HB1)							of the Proposed Development and the heritage asset	
No 2 Reservoir (HB2)	Erosion of rural setting surrounding the asset	Permanent, Indirect	High	Low	United Kingdom	Minor Adverse	Provision of buffer of rural space between the edge of the Proposed Development and the heritage asset	Minor Adverse
Pavilion at Hewlett's Reservoir (HB3)	Erosion of rural setting surrounding the asset	Permanent, Indirect	High	Low	United Kingdom	Minor Adverse	Provision of buffer of rural space between the edge of the Proposed Development and the heritage asset	Minor Adverse
Gates, Gatepiers and Boundary Walls at Hewlett's Reservoir (HB4)	Erosion of rural setting surrounding the asset	Permanent, Indirect	High	Low	United Kingdom	Minor Adverse	Provision of buffer of rural space between the edge of the Proposed Development and the heritage asset	Minor Adverse
Stone Lodge at Hewlett's Reservoir (HB5)	Erosion of rural setting surrounding the asset	Permanent, Indirect	Low	Low	Local	Minor Adverse	Provision of buffer of rural space between the edge of the Proposed Development and the heritage asset	Minor Adverse
Agricultural Buildings at	No further effect	N/A	Low	N/A	Local	N/A	N/A	N/A

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
Oakley Farm (HB6)								
Battledown Camp, Scheduled Monument (ARCH1)	Erosion of rural setting surrounding the asset	Permanent, Indirect	High	Low	United Kingdom	Minor Adverse	N/A	Minor Adverse
Probable Prehistoric feature (ARCH2)	None – asset removed during Construction Phase							
Group of undated pits (ARCH3)	None – asset removed during Construction Phase							
Post-Medieval(?) ditch (ARCH4)	None – asset removed during Construction Phase							
Probable furrow (ARCH5)	None – asset removed during Construction Phase							
Cumulative and In-combination								
No 1 Reservoir (HB1)	Some potential for Cumulative impact arising from proposed development 18/02581	Permanent, Indirect	High	Low	United Kingdom	Minor Adverse	Provision of buffer of rural space between the edge of the Proposed Development and the heritage asset	Minor Adverse

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
	creating further erosion of rural setting							
No 2 Reservoir (HB2)	Some potential for Cumulative impact arising from proposed development 18/02581 creating further erosion of rural setting	Permanent, Indirect	High	Low	United Kingdom	Minor Adverse	Provision of buffer of rural space between the edge of the Proposed Development and the heritage asset	Minor Adverse
Pavilion at Hewlett's Reservoir (HB3)	Some potential for Cumulative impact arising from proposed development 18/02581 creating further erosion of rural setting	Permanent, Indirect	High	Low	United Kingdom	Minor Adverse	Provision of buffer of rural space between the edge of the Proposed Development and the heritage asset	Minor Adverse
Gates, Gatepiers and Boundary Walls at Hewlett's Reservoir (HB4)	Some potential for Cumulative impact arising from proposed development 18/02581 creating further erosion of rural setting	Permanent, Indirect	High	Low	United Kingdom	Minor Adverse	Provision of buffer of rural space between the edge of the Proposed Development and the heritage asset	Minor Adverse
Stone Lodge	Some potential for	Permanent,	Low	Low	Local	Minor Adverse	Provision of buffer	Minor Adverse

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
at Hewlett's Reservoir (HB5)	Cumulative impact arising from proposed development 18/02581 creating further erosion of rural setting	Indirect					of rural space between the edge of the Proposed Development and the heritage asset	
Agricultural Buildings at Oakley Farm (HB6)	N/A	N/A	Low	N/A	Local	N/A	N/A	N/A
Battledown Camp, Scheduled Monument (ARCH1)	Some potential for Cumulative impact arising from proposed development	Permanent, Indirect	High	Low	United Kingdom	Negligible to Minor Adverse	N/A	Negligible to Minor Adverse
Probable Prehistoric feature (ARCH2)	None – asset removed during Construction Phase							
Group of undated pits (ARCH3)	None – asset removed during Construction Phase							
Post-Medieval(?) ditch (ARCH4)	None – asset removed during Construction Phase							

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
Probable furrow (ARCH5)	None – asset removed during Construction Phase							

9 TRANSPORT AND ACCESS

9.1 INTRODUCTION

9.1.1 This chapter considers the transport related environmental effects of the Proposed Development, and identifies, where necessary, mitigation measures in accordance with the relevant planning policy framework and guidance.

9.1.2 The EIA transport assessment has been undertaken informed by the Transport Assessment (TA) (**Appendix 9.1**) and inspection of the surrounding area.

9.1.3 An Interim Residential Travel Plan (**Appendix 9.2**) has been prepared in conjunction with the TA as a guide to managing travel to and from the Proposed Development.

9.2 ASSESSMENT APPROACH

9.2.1 The EIA transport assessment reported in this chapter has drawn primarily on the technical assessment undertaken for and reported in the TA. The methodology for the TA technical assessment is set out in the TA and has been agreed with Gloucestershire County Council, in its role as the local transport authority, through pre-application consultation.

Methodology

9.2.2 The EIA transport assessment has been based upon the Institute of Environmental Assessment (now the Institute of Environmental Management & Assessment) guidance document Guidelines for the Environmental Assessment of Road Traffic (the IEMA Guidelines). The IEMA Guidelines suggest in paragraph 3.15 that two broad rules-of-thumb could be used as a screening process to delimit the scale and extent of the assessment. These are:

Rule 1 include highway links where traffic flows will increase by more than 30% (or the number of heavy good vehicles will increase by more than 30%)

Rule 2 include any other specifically sensitive areas where traffic flows have increased by 10% or more.

9.2.3 These rules-of-thumb form the starting point for the assessment of effects. Paragraph 3.16 of the IEMA Guidelines comments that projected changes in traffic flows of 10% or less create no discernible environmental impact. Paragraph 3.20 explains that sensitive locations under Rule 2 include accident black-spots, conservation areas, hospitals and links with high pedestrian flows.

Study Area

9.2.4 The Study Area for this assessment covers the immediate surrounding transport network, in particular Harp Hill. Noise and air quality effects are addressed elsewhere in the ES.

Assessment of Significance

9.2.5 The significance of the transport effects of the Proposed Development is considered in the context of the following subject areas, which are based on the IEMA Guidelines:

- Severance
- Driver Delay
- Pedestrian Delay
- Pedestrian Amenity
- Fear and Intimidation
- Accidents and Safety

9.2.6 Hazardous Loads have not been included because no hazardous loads are anticipated to be associated with the Proposed Development.

9.2.7 The groups and special interests that may be affected by the Proposed Development have been considered and the following list of potential 'receptors' has been identified, based upon Paragraph 3.20 of the IEMA Guidelines:

- Sensitive groups including children, the elderly and the disabled
- Accident 'black spots'
- Highway corridor operating close to or over capacity
- People walking
- People cycling
- Sensitive locations – schools, hospitals and town centre

9.2.8 To record the likely significant environmental effects of the Proposed Development, the following methodology has been adopted.

9.2.9 First a magnitude of change scale in respect of each of the transport subject areas is defined in **Table 9.1**. This scale is based on the thresholds identified in the IEMA guidelines supplemented by best practice and professional judgement.

Table 9.1: Magnitude of Change Scale

Subject Area	**Magnitude of Change**			
	High	**Medium**	**Low**	**Negligible**
Severance	Change in highway link traffic flow of over 60%	Change in highway link traffic flow of 30% to less than 60%	Change in highway link traffic flow of 10% to less than 30%	Change in highway link traffic flow of less than 10%
Driver Delay	Change in average delay per vehicle of over 60%	Change in average delay per vehicle of 30% to less than 60%	Change in average delay per vehicle of 10% to less than 30%	Change in average delay per vehicle of less than 10%
Pedestrian Delay	Change in highway link traffic flow of over 60%	Change in highway link traffic flow of 30% to less than 60%	Change in highway link traffic flow of 10% to less than 30%	Change in highway link traffic flow of less than 10%
Pedestrian Amenity	Change in highway link traffic flow of over 60%	Change in highway link traffic flow of 30% to less than 60%	Change in highway link traffic flow of 10% to less than 30%	Change in highway link traffic flow of less than 10%

Subject Area	Magnitude of Change			
	High	**Medium**	**Low**	**Negligible**
Fear and Intimidation	Change in highway link traffic flow of over 60%	Change in highway link traffic flow of 30% to less than 60%	Change in highway link traffic flow of 10% to less than 30%	Change in highway link traffic flow of less than 10%
Accidents and Safety	Change in highway link / junction traffic flow of over 60%	Change in highway link / junction traffic flow of 30% to less than 60%	Change in highway link / junction traffic flow of 10% to less than 30%	Change in highway link / junction traffic flow of less than 10%

9.2.10 A Sensitivity of Receptor Scale is defined in **Table 9.2**.

Table 9.2: Sensitivity of Receptor Scale

High	Medium	Low	Negligible
Sensitive groups including children, elderly and disabled Locations with poor collision records Sensitive locations – schools, hospitals and town centre	People walking People cycling Key highway corridor or junction	N/A	N/A

9.2.11 A matrix is then developed which identifies the significance of the effects as follows.

Table 9.3: Significance Matrix

		Sensitivity of Receptor			
		High	**Medium**	**Low**	**Negligible**
Magnitude of Change	**High**	**Major**	**Major**	**Moderate**	Negligible
	Medium	**Major**	**Moderate**	Minor to Moderate	Negligible
	Low	**Moderate**	Minor to Moderate	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

9.2.12 As is highlighted in the table, Major and Moderate effects are considered significant for the purpose of the EIA Regulations.

9.2.13 Any likely significant environmental effects are recorded against the seven point Significance Scale as set out in Chapter 2: Assessment Scope and Methodology. The scale is derived from the interaction of the receptor sensitivity and magnitude of change of effect as detailed in the matrix set out in **Table 9.3**, and described in transport terms, for the purpose of this EIA transport assessment, as follows:

Table 9.4: Significance Scale

Significance Scale	Description
Major Beneficial	Change that would delay the need for planned modification to off-site infrastructure
Moderate Beneficial	Increased perception of changing conditions that may delay the need for planned modifications to off-site infrastructure
Minor Beneficial	Perception of changing conditions e.g. reduction in delay
Neutral / Not Significant	No perceivable change
Minor Adverse	Perception of changing conditions e.g. increase in delay
Moderate Adverse	Increased perception of changing conditions that may require modifications to off-site infrastructure
Major Adverse	Change requiring modifications to off-site infrastructure

9.2.14 The assessment has considered the significant effects, as appropriate, that are: direct; indirect; secondary; cumulative; short term; medium term; long term; permanent; temporary; positive and negative. For this assessment, short term has been considered as less than one year, medium term effect as between one and ten years in duration, and long term as greater than 10 years.

Legislative and Policy Framework

9.2.15 The EIA transport assessment has considered the development proposals and transport issues with reference to national and local policy and guidance, as follows:

National Policies

- National Planning Policy Framework (NPPF) July 2018

Local Policies

- Gloucestershire Local Transport Plan
- Joint Core Strategy for Gloucester, Cheltenham and Tewkesbury (JCS)
- Cheltenham Borough Local Plan – Adopted 2006 (Saved Policies)
- The Cheltenham Plan – Emerging Local Plan

Guidance

- Guidelines for the Environmental Assessment of Road Traffic, Institute of Environmental Management and Assessment (1993)
- Design Manual for Roads and Bridges (http://www.standardsforhighways.co.uk/ha/standards/dmrb/)
  - CD 123 Geometric Design of at-grade priority and signal-controlled junctions
  - TD 9/93 Highway Link Design
  - GG 119 Road Safety Audit
- Manual for Streets, Department for Transport (2007), & Manual for Streets 2, Chartered Institution of Highways & Transportation (2010)
- Planning Practice Guidance to the NPPF (https://www.gov.uk/government/collections/planning-practice-guidance)

Survey Techniques

9.2.16 Traffic surveys were carried out on the road network in the vicinity of the site by an independent specialist survey company in September 2019. The surveys included:

- Automatic traffic counts (ATCs);
- Manual classified turning counts (MCCs); and
- Queue length surveys.

Scoping Criteria

9.2.17 A Transport Assessment Scoping Study setting out the proposed scope and methodology for the TA was prepared and submitted to Gloucestershire County Council for approval on 10 May 2019. Comments were received from GCC dated 13 June 2019 and these have been taken into account in the preparation of the TA.

9.2.18 This chapter also takes account of CBC's Scoping Opinion dated 12 July 2019.

9.2.19 CBC's scoping opinion acknowledges that the applicant has entered into pre-application discussions with the County Council (GCC) in respect of the Transport Assessment, and identifies this as a separate exercise involving GCC, and therefore CBC's scoping opinion does not deal specifically with transport related matters. However, CBC's scoping opinion does include some more general comments in relation to transport assessment and access, as follows:

> **The Environmental Statement should include an assessment of the Emergency Services (ambulance, fire and rescue and police) and the Council would expect a Framework/Draft Travel Plan to accompany the Transport Assessment.**

9.2.20 The EIA transport assessment, based on the TA technical assessment, includes as assessment of access for the Emergency Services to the Proposed Development.

9.2.21 An Interim Residential Travel Plan has been prepared in conjunction with the TA and is provided as part of the planning application documentation.

9.2.22 CBC's scoping opinion also makes reference to a condition attached to the 1998 outline planning permission relating to residential development on land adjacent to the Application Site (GCHQ Oakley behind Sainsbury's) (Ref. 97/00818/PO). The condition reads:

> **19. No more than 40 houses shall be served by the access onto Harp Hill at the east end of the site.**
>
> **Reason: the road network in the locality is not capable of accommodating the traffic associated with more than this number of houses.**

9.2.23 The scoping opinion goes on to say that the relevance of this condition to the Proposed Development will need to be discussed with GCC Highways at an early stage and included in any Transport Assessment, particularly when considering the cumulative/wider area effects of the proposals.

Limitations to the Assessment

9.2.24 It is considered that there are no particular technical limitations placed on the assessment.

9.3 BASELINE CONDITIONS

Site Description and Context

9.3.1 The Application Site comprises an area of approximately 14.9 hectares of land at Oakley Farm, Cheltenham, and it is located north of Harp Hill, approximately 3km east of Cheltenham town centre. It is bounded by Harp Hill to the south, existing residential development to the west and north, and further residential development and Hewlett's Reservoir site to the east. Cheltenham Footpath 86, a Public Right of Way, routes along the western boundary connecting Harp Hill with the B4075 Priors Road, via the existing farm access. The farm access extends eastwards from the B4075 Priors Road along the northern extent of the site.

Baseline Survey Information

9.3.2 Baseline information collected is summarised in **Table 9.5**.

Table 9.5: Baseline Information

Baseline Information	Source
Existing transport network	Site visits / OS Mapping / topographical survey / Google Streetview
Public rights of way	Gloucestershire County Council
Local cycle routes	Cheltenham Borough Council
Public transport information	Public transport operator timetable information, Traveline and National Rail Enquires
Road traffic collision data	Gloucestershire County Council
2019 peak period traffic data	Independent traffic survey company

Local Highway Network

Harp Hill

9.3.3 Harp Hill borders the Application Site to the south and is subject to a 30mph speed limit within the vicinity of the Application Site and street lighting is present. There is no provision for pedestrians along the majority of the site frontage, although an informal path appears to have been formed along the verge on the southern side of the carriageway in front of the existing residential properties.

9.3.4 Towards the western end of the Application Site's frontage with Harp Hill, there is a footway on the southern side of Harp Hill, to the west of the junction with Stanley Road, which continues westwards towards the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout. A further 230m to the west of Stanley Road, there are footways on both sides of Harp Hill leading towards the double roundabout and Cheltenham town centre.

B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road Double Roundabout

9.3.5 The existing B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout comprises two 3-arm roundabouts, one of which is a mini-roundabout, located approximately 45m apart, measured from the central islands. There is one traffic lane on all approaches. There are footways on both sides of the carriageway with uncontrolled crossing points on all external approaches to the junction as well as across the centre section between the junctions, the majority of which have dropped kerbs and tactile paving.

Priors Road (B4075)

9.3.6 Priors Road is located to the west of the Application Site and connects with Cheltenham Footpath 86, the key existing pedestrian access route to the Application Site. Priors Road routes between the double roundabout junction with Harp Hill, to the south, and Prestbury Road, to the north. Priors Road is a single carriageway with one lane in each direction, with the exception of the signalised junction with Redmarley Road, where there are additional lanes for right and left turning traffic. Staggered Toucan crossing facilities are provided at the junction across Priors Road and Redmarley Road. Priors Road has street lighting, a footway on either side and is subject to a 30mph speed limit.

Existing Traffic Data

9.3.7 Existing traffic flows on Harp Hill have been established from an automatic traffic counter (ATC) in September 2019. Summary traffic flow information is set out in **Table 9.6**.

Table 9.6: Average Weekday Traffic Flows (vehicles)

Time Period	**Harp Hill**	
	Direction	**Traffic Flow (vehicles)**
AM Peak Hour (08:00-09:00)	Eastbound	225
	Westbound	282
	Total	507
PM Peak Hour (17:00-18:00)	Eastbound	168
	Westbound	221
	Total	389
24-Hour	Eastbound	1,730
	Westbound	2,055
	Total	3,785

9.3.8 On an average weekday (24-Hour), approximately 1% of vehicles on Harp Hill were recorded as HGVs.

9.3.9 The ATC also recorded traffic speeds. Average weekday mean and 85th percentile speeds are summarised in **Table 9.7**.

Table 9.7: Average Weekday Traffic Speeds (mph)

Harp Hill		
Direction	**Average Mean Speed (mph)**	**Average 85%ile Speed (mph)**
Eastbound	28.7	33.9
Westbound	27.3	31.7

9.3.10 Spreadsheets summarising the 2019 Base Year AM and PM peak hour turning counts at junctions in the vicinity of the Proposed Development.

Walking and Cycling

9.3.11 Cheltenham Footpath 86, an existing public right of way, routes along the western edge of the Application Site, from Harp Hill to the north-western corner of the Application Site. There are no footways on Harp Hill along the majority of the Application Site frontage, although an informal path appears to have been formed along the southern side of the carriageway in front of the existing residential properties. Towards the western end of the Application Site's frontage with Harp Hill, there is a footway on the southern side of Harp Hill, to the west of the junction with Stanley Road, which continues westwards towards to the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout. A further 230m to the west of Stanley Road, there are footways to both sides of Harp Hill leading towards the double roundabout and Cheltenham town centre.

9.3.12 Cheltenham Footpath 86 offers opportunities for access from the Application Site towards Priors Road, to the west, and Harp Hill, to the south. Priors Road has footways and formal pedestrian and cyclist crossing points. There is currently no footway present on the northern side of Harp Hill where Cheltenham Footpath 86 emerges onto Harp Hill; pedestrians must cross the carriageway to join the footway on the southern side of Harp Hill. There is no existing formal or informal crossing point.

9.3.13 Cheltenham town centre is within 3km of the Application Site. From Priors Road and Harp Hill towards Cheltenham town centre, the network of pedestrian facilities is comprehensive with lit footways and pedestrian crossing points.

9.3.14 There is no specific provision for people travelling by cycle on Harp Hill; however the Cheltenham Cycle Map classes the road as a route which is suitable for people with a moderate level of experience/confidence. Other residential streets surrounding the Application Site are generally considered as quiet roads suitable for most people to cycle on. A signposted route for cycles is provided from Priors Road to the town centre via Whaddon Road, Prestbury Road and Winchcombe Street. This route is direct but has limited cycle-specific infrastructure.

Public Transport

9.3.15 The nearest bus stops to the Application Site are located in the existing built up area to the north west of the Application Site in the vicinity of Sainsbury's on Priors Road and in the vicinity of the Community Centre on Whaddon Road.

9.3.16 Bus routes Q and P, which serve the Sainsbury's bus stops, provide a regular circular town route, via the town centre. These routes, which operate in opposite directions, currently both operate on a 120 minute frequency.

9.3.17 Bus route A offers a more frequent service, which also serves Cheltenham town centre, but also provides longer distance travel options to destinations including GCHQ, a key employment site. The service operates at a frequency of approximately every 12 minutes during the week and every 15 – 20 minutes at weekends.

9.3.18 Cheltenham Spa Railway Station is located approximately 4.6 km from the centre of the Application Site. Cheltenham Spa has excellent rail links to destinations across the country. CrossCountry, GWR, Transport for Wales and West Midlands Trains all operate from the station providing hourly services to destinations including Cardiff Central, London Paddington, Birmingham and Nottingham, as well as to Bristol Temple Meads and Manchester Piccadilly. Services to Gloucester operate at a typical frequency of 2-4 services per hour.

9.3.19 The approximate journey time to key locations is shown below:

- Gloucester – 10 minutes
- Bristol Temple Meads – 45 minutes
- Birmingham New Street – 45 minutes
- Cardiff Central – 80 minutes
- London Paddington – 125 minutes

9.3.20 Cheltenham Station is accessible by cycle, and sheltered cycle parking is available outside the station. Bus route A stops on Arle Road, which is approximately 1km walk from the station.

Road Safety

9.3.21 Collision data have been obtained from GCC for the roads within the study area. The collision data covers the 5-year period from 1 January 2014 to 31 December 2018.

9.3.22 There were no collisions recorded within the EIA transport assessment study area over the five year assessment period, which includes Harp Hill, the B4075 Priors Road in the vicinity of the site, and the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout.

9.3.23 Overall it is considered that the collision records do not point to any existing highway safety issues which require more detailed examination as part of the EIA transport assessment.

9.4 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

9.4.1 The EIA transport assessment has considered the likely significant effects in relation to the construction, operation and decommissioning phases of the Proposed Development.

9.4.2 The Proposed Development, described in more detail elsewhere in the Environmental Statement, includes the following elements:

- Demolition of existing buildings;
- Up to 250 residential dwellings;
- Open space and landscaping;
- Vehicular access from Harp Hill, parking; and
- Supporting infrastructure and utilities.

9.4.3 The Land Use Parameter Plan (**Figure 3.1**) identifies the proposed area of built development, green infrastructure and the zone within which the highway corridor will be located.

9.4.4 The Access and Movement Parameter Plan (**Figure 3.4**) also identifies the highway corridor flexibility zone, as well as the proposed pedestrian / cycleway linkages, the existing public right of way and the potential emergency access.

Construction

9.4.5 Construction activities will include the building of the residential dwellings plus the civil engineering works associated with the construction of the new infrastructure, including the new site access junction and internal development roads, cycling and walking links, drainage attenuation features, and landscaping etc.

9.4.6 Construction of the Proposed Development will give rise to deliveries of materials and products that will be transported by heavy goods vehicles (HGVs). In addition there will be on site operation of construction equipment and plant.

9.4.7 The likely numbers of construction vehicles is dependent on the rate of construction, which in turn is affected by prevailing market forces. Assuming a nominal annual build rate of approximately 70 units, a development of 250 units would mean an overall construction period of approximately 3-4 years. It takes around 70 operatives to build at this rate, plus an additional 14 site staff. As a worst case, assuming no car sharing or non-car trips, these operatives and site staff would generate 84 vehicle movements in the morning as well as in the evening.

9.4.8 It is estimated that on a typical day there may be in the order of 7 HGV trips per day, equating to on average 14 two-way HGV vehicle movements per day. This is equivalent to less than 2 HGV movements per hour.

Severance, Pedestrian Delay, Pedestrian Amenity, and Fear and Intimidation

9.4.9 The percentage change in traffic flow as a result of construction traffic should not result in more than a **Negligible** magnitude of change (less than 10%) in respect of Severance, Pedestrian Delay, Pedestrian Amenity, and Fear and Intimidation. Thus irrespective of the Sensitivity of the Receptor, applying the Significance Matrix, the likely effect would be of **Negligible** significance.

9.4.10 Setting aside the percentage change in traffic flow, the effects of construction traffic, particularly HGVs, could be perceived by other road users to be a **Minor Adverse** significant effect; however the construction period is only temporary and expected to be medium term in its effect.

Driver Delay

9.4.11 The percentage change in traffic flow as a result of construction traffic should not result in more than a **Negligible** magnitude of change in respect of Driver Delay. During peak periods of construction activity, in particular in the vicinity of Harp Hill and the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout, which is a **Medium** sensitive receptor, the effect may potentially increase to **Minor – Moderate Adverse** for a short period without mitigation.

Accidents and Safety

9.4.12 There were no collisions recorded within the EIA transport assessment study area. The TA found that the collision data does not point to any existing highway safety issues which require more detailed examination nor does it highlight any part of the highway network that might experience a change to the personal injury accident rate during construction. The percentage change in traffic flow as a result of construction traffic should not result in more than a **Negligible** magnitude of change. It is concluded therefore that the effect on Accidents and Safety during the Construction period would be **Negligible**.

Operation

9.4.13 The operation of the Proposed Development refers to when the development is completed and all dwellings are occupied, representing the greatest effect on the surrounding transport network.

9.4.14 The TA provides the methodology behind the assessment of the traffic effects on the local network. In summary, the assessment considers the following scenarios:

- 2019 Base Year *(Scenario 1)*
- 2024 with Committed Development *(Scenario 2)*
- 2024 with Committed Development plus Proposed Development *(Scenario 3)*

9.4.15 Traffic growth has been applied to the 2019 base year traffic flows to establish the 2024 forecasts with background growth, in accordance with recommended current practice, using the TEMPro software to derive traffic growth factors based on the National Trip End Model. In addition, other committed development has been included explicitly.

9.4.16 Predicted trip generation and distribution for the weekday AM (08:00 – 09:00) and PM (17:00 – 18:00) peak periods are set out below. Trip generation rates have been derived from the TRICS database. Based on these trip rates, the Proposed Development would generate the following vehicular trips during the weekday AM and PM peak hours:

Table 9.8: Predicted Proposed Development Vehicular Trip Generation

Time Period	Arrivals	Departures	Total
AM Peak Hour (08:00 – 09:00)	30	94	124
PM Peak Hour (17:00 – 18:00)	85	39	124

9.4.17 The distribution of the generated traffic onto the surrounding highway network has been based on 2011 Census journey to work data for car driver mode of travel.

9.4.18 Diagrams summarising the 2024 AM and PM peak hour link flows without and with the Proposed Development are contained in **Figures 9.1 – 9.4.**

9.4.19 The new site access junction is proposed on Harp Hill to the south of the Application Site. The maximum effect in terms of percentage change in modelled link flows with the Proposed Development occurs on Harp Hill. To the west of the new site access junction, Harp Hill is predicted to experience an 18.9% increase in traffic in the AM peak and a 20.9% increase in the PM peak. To the east of the new site access, Harp Hill is predicted to experience a 3.5% increase in traffic in the AM peak and a 3.9% increase in the PM peak.

9.4.20 Further afield the predicted increase in traffic on the surrounding highway links is well below 10%. Other than Harp Hill, no highway links meet the criteria for assessment set out in the Assessment Approach section above.

Severance, Pedestrian Delay, Pedestrian Amenity, and Fear and Intimidation

9.4.21 Only links that would experience a change in traffic flow of 10% or more need to be identified, because a change in highway link traffic flow of less than 10% would have a Magnitude of Change that would be **Negligible**. Irrespective of the Sensitivity of Receptor, applying the Assessment Matrix the effect would be **Negligible,** and a Negligible effect is defined as **"No perceivable change"** on the Significance Scale.

9.4.22 By reference to the TA and the discussion above, the only link that is predicted to experience an increase in traffic flow of greater than 10% is Harp Hill to the west of the proposed new site access junction. The predicted increase in traffic flow is a **Low** Magnitude of Change. The Sensitivity of the Receptors, people walking and cycling, is

Medium; therefore, applying the Assessment Matrix the effect would be **Minor - Moderate Adverse**, without any mitigation.

Driver Delay

9.4.23 Harp Hill, to the west of the new site access junction, is predicted to experience an increase in traffic flows with the Proposed Development, which equates to a **Low** Magnitude of Change. The increase in traffic flows associated with the Proposed Development on all other links within the EIA transport assessment study area is less than 10%. Therefore, only Harp Hill meets the criteria for assessment set out in the Assessment Approach section above for the purposes of screening.

9.4.24 In order to determine the effect of the Proposed Development in respect of Driver Delay, junction capacity analysis has been undertaken for the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout. It is highlighted that although Harp Hill is predicted to experience an increase in traffic flow of greater than 10%, the junction overall is likely to experience an increase in traffic flows in the order of 4.8% - 4.9% during the peak hours. TRL's Junctions 9 model has been used to assess the operational capacity of the junction and the results for Harp Hill are summarised in **Table 9.9 and Table 9.10**.

Table 9.9: Existing B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road Double Roundabout Junctions 9 Results– AM Peak Hour (08:00 – 09:00)

	Harp Hill Approach		
Scenario	**Max Queue (vehicles)**	**Max Delay (seconds / vehicle)**	**Max RFC**
2024 with Committed Development	7	80	0.89
2024 with Committed Development plus Proposed Development	43	403	1.11
Difference	+36	+323	+0.22
Percentage difference	+514.3%	+403.8%	+24.7%

Table 9.10: Existing B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road Double Roundabout Junctions 9 Results – PM Peak Hour (17:00 – 18:00)

	Harp Hill Approach		
Scenario	**Max Queue (vehicles)**	**Max Delay (seconds / vehicle)**	**Max RFC**
2024 with Committed Development	2	19	0.60
2024 with Committed Development plus Proposed Development	2	23	0.67
Difference	0	+4	+0.07
Percentage difference	0.0%	+21.1%	+11.7%

9.4.25 Driver delay on the Harp Hill approach at the existing B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout is predicted to increase by an average of 323 seconds in the AM peak hour and 4 seconds in the PM peak hour as a result of the Proposed Development. In percentage terms, the Magnitude of Change is **High** in the AM peak hour and **Low** in the PM peak hour. The Harp Hill approach to the junction in the AM peak hour is also predicted to have a Maximum RFC (Ratio of Flow to Capacity) of greater than 1, suggesting that this approach is operating over capacity. The Sensitivity of the Receptor is **Medium**. Applying the Assessment Matrix, the effect on this junction would be **Major Adverse** in the AM peak hour and **Minor to Moderate Adverse** in the PM peak hour. A Major Adverse effect is defined as a **"Change requiring modifications to off-site infrastructure"**. A Minor Adverse effect is defined as a **"Perception of changing conditions e.g. increase in delay"**. A Moderate Adverse effect is defined as an **"Increased perception of changing conditions that may require modifications to off-site infrastructure"**.

9.4.26 Beyond the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout, the increase in traffic flow associated with the Proposed Development is predicted to be 2% or less. Therefore no further assessment is required.

Accidents and Safety

9.4.27 As identified above, there were no collisions recorded within the EIA transport assessment study area over the five year assessment period. This includes Harp Hill, the B4075 Priors Road in the vicinity of the site, and the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout junction. The TA found that the collision data does not point to any existing highway safety issues which require more detailed examination.

9.4.28 It has been predicted that the Proposed Development would result in an increase of 18.9% - 20.9% in link traffic flow on Harp Hill, which would have a Magnitude of Change that would be **Low**. With reference to the baseline assessment, Harp Hill is not a location with a poor collision record, and therefore the Sensitivity of Receptor is **Negligible**. Applying the Assessment Matrix the effect would be **Negligible** and a Negligible effect is defined as **"No perceivable change"**. It is therefore considered that no specific mitigation is required as a result of the Proposed Development in respect of Accidents and Safety.

9.4.29 With regards to access to the Proposed Development for Emergency Services, the new site access junction and the internal road layout will be designed in accordance with the Design Manual for Roads and Bridges, Manual for Streets, and local authority design guidance, as appropriate. This, together with a potential emergency access via the route of the existing farm access from Priors Road, should ensure that safe and suitable access for Emergency Services can be achieved.

Decommissioning

9.4.30 Given the nature and intended longevity of the Proposed Development's operational life, decommissioning has not been considered relevant as part of this study. Accordingly, this chapter focuses on the potential likely significant effects during construction and operational phases only.

9.5 MITIGATION AND ENHANCEMENT

Mitigation by Design

9.5.1 The new site access junction will be designed in accordance with the Design Manual for Roads and Bridges, Manual for Streets, and local authority design guidance,

as appropriate, to ensure that it is safe and suitable. In addition a potential emergency access is proposed via the route of the existing farm access from Priors Road.

9.5.2 The internal site layout will be designed in a manner which facilitates walking and cycling, providing linkages to existing routes, including the existing public right of way, which links to the B4075 Priors Road and Harp Hill, to allow good access for sustainable modes of transport.

9.5.3 A shared pedestrian / cycle link is proposed between the proposed development and the B4075 Priors Road along the route of the existing farm access. This link will extend along the northern boundary of the application site with connections to the existing public right of way, Cheltenham Footpath 86, and the proposed development. These linkages are identified on the Access and Movement Parameter Plan, which also identifies pedestrian linkages to Harp Hill at the western and eastern extents of the application site's Harp Hill frontage. Cycle linkages to Harp Hill are proposed via the new site access junction.

Additional Mitigation

Construction

9.5.4 Mitigation measures will be implemented during construction in the form of controls imposed by planning conditions, health and safety legislation requirements and good construction site practices. Managing the construction effects will also form part of the Construction Management Plan or similar document. The management control mitigation measures will be intended to protect the environment, amenity and safety of local residents, businesses, the general public and the surroundings in the vicinity of the Proposed Development.

9.5.5 As part of a Construction Management Plan or similar, a construction vehicle routeing regime for access to the construction site will be identified and agreed with the local highway authority to ensure that drivers of construction related vehicles do not use inappropriate routes. The regime will aim to ensure that construction vehicles use the strategic highway network wherever possible.

Operation

9.5.6 To ensure that the Proposed Development is planning policy compliant, measures to encourage walking, cycling and public transport, to mitigate the additional travel demands of the Proposed Development, and to improve the surrounding transport infrastructure are proposed. These measures are summarised below.

9.5.7 Additional mitigation during operation will include a financial contribution towards a new section of footway on the northern side of Harp Hill to provide a link between Cheltenham Footpath 86, where it emerges onto Harp Hill, and the existing footway on the northern side of Harp Hill, which currently terminates approximately 70m to the west of the application site's western boundary.

9.5.8 A financial contribution will be made towards an uncontrolled pedestrian crossing facility on Harp Hill, towards the western end of the application site's frontage. The crossing will provide a link between the existing public right of way route, Cheltenham Footpath 86, the new pedestrian routes within the proposed development, and the existing footway provision on the south side of Harp Hill.

9.5.9 A financial contribution will be made towards the provision of a controlled Toucan crossing facility on Priors Road and a section of shared footway/cycleway on the

western side of the carriageway to link with the existing signposted cycle route towards the town centre via Whaddon Road.

9.5.10 Additional mitigation during operation will also include implementation of a Residential Travel Plan to encourage travel by sustainable modes. If required, a proportionate contribution will be made towards enhancement to pedestrian and cycle routes in the wider area, subject to further consultation with GCC, with reference to the Review of Routes exercise undertaken as part of the Transport Assessment.

9.5.11 If required, a proportionate contribution will be made towards enhancement to bus services in the area.

9.5.12 A proportionate contribution will be made towards improvements to the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout, subject to further consultation with GCC, as the local highway authority.

Table 9.11: Mitigation

Ref	Measure to avoid, reduce or manage any adverse effects and/or to deliver beneficial effects	How measure would be secured		
		By Design	By S.106	By Condition
1	A Construction Management Plan or similar, to include a construction vehicle routeing regime, will be prepared to manage the construction effects of the Proposed Development.			X
2	The new site access will be designed in accordance with the Design Manual for Roads and Bridges, Manual for Streets and local authority design guidance, as appropriate, to ensure that it is safe and suitable.	X		
3	The internal site layout will be designed to include a potential emergency access via the route of the existing farm access from Priors Road	X		
4	The internal site layout will be designed in a manner which facilities walking and cycling, and provides linkages to existing routes, including the existing public right of way, which links to both Priors Road and Harp Hill, to allow good access for sustainable modes of transport.	X		
5	A shared pedestrian / cycleway link will be provided for access to the existing bus stops and local facilities on Priors Road.	X		
6	A financial contribution will be made towards a new section of footway on the northern side of Harp Hill, to provide a link between Cheltenham Footpath 86, where it emerges onto Harp Hill, and the existing footway on the north side of Harp Hill.		X	

Ref	Measure to avoid, reduce or manage any adverse effects and/or to deliver beneficial effects	How measure would be secured		
		By Design	By S.106	By Condition
7	A financial contribution will be made towards an uncontrolled pedestrian crossing facility on Harp Hill, towards the western end of the site frontage, to link with the existing footway provision on the south side of Harp Hill.		X	
8	A financial contribution will be made towards a new Toucan crossing facility on Priors Road and a section of shared footway/cycleway on the western side of the carriageway, to link with the existing signposted cycle route towards the town centre on Whaddon Road.		X	
9	An Interim Residential Travel Plan has been prepared in conjunction with the TA to provide a framework for the developer working in conjunction with the local highway authority to promote sustainable travel patterns and behaviour without reducing mobility or accessibility.			X
10	If required, a proportionate contribution will be made towards enhancement to pedestrian and cycle routes in the wider area.		X	
11	If required, a proportionate contribution will be made towards enhancement to public transport (bus) services in the vicinity of the Proposed Development.		X	
12	A proportionate contribution will be made towards improvements at the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout.		X	

Enhancements

9.5.13 The proposed additional mitigation / enhancement includes a financial contribution towards a new section of footway and an uncontrolled pedestrian crossing facility on Harp Hill, towards the western end of the site frontage, to link with the existing footway provision on both the north and south sides of Harp Hill; a controlled Toucan crossing and a shared footway/cycleway on Priors Road to connect with the existing signposted cycle route on Whaddon Road; and a proportional contribution towards improvements at the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout.

9.5.14 The proposed mitigation / enhancement measures have been considered in respect of the subject areas set out in the Assessment Approach section above.

Severance, Pedestrian Delay, Pedestrian Amenity, and Fear and Intimidation

9.5.15 It is considered that the new section of footway and the uncontrolled pedestrian crossing facility on Harp Hill would have a **Minor – Moderate Beneficial** effect on pedestrians using the public right of way route, Cheltenham Footpath 86. The new facility would also benefit residents of the Proposed Development who wish to walk towards the town centre or other facilities, via Harp Hill. A Minor Beneficial effect is defined as a **"Perception of changing conditions e.g. reduction in delay"**. A Moderate Beneficial effect is defined as an **"Increased perception of changing conditions that may delay the need for planned modifications to off-site infrastructure"**.

9.5.16 It is considered that the new Toucan crossing and section of shared footway/cycleway on Priors Road would have a **Moderate - Major Beneficial** effect on pedestrians and cyclists using the public right of way route and new shared footway/cycleway link between the Application Site and Priors Road. The new facility would improve access to the existing northbound bus stop on Priors Road as well as benefitting both existing residents on Harp Hill and new residents of the Proposed Development, who wish to walk or cycle towards the town centre or other facilities, via Priors Road and Whaddon Road. A Moderate Beneficial effect is defined as an **"Increased perception of changing conditions that may delay the need for planned modifications to off-site infrastructure"**. A Major Beneficial effect is defined as **"Change that would delay the need for planned modification to off-site infrastructure"**.

Driver Delay

9.5.17 The capacity of the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout has been further assessed with minor highway improvements to the Harp Hill and Hewlett Road approaches to the junction. The results for Harp Hill are summarised in **Table 9.12 and Table 9.13**.

Table 9.12: Improved B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road Double Roundabout Junctions 9 Results– AM Peak Hour (08:00 – 09:00)

	Harp Hill Approach		
Scenario	**Max Queue (vehicles)**	**Max Delay (seconds / vehicle)**	**Max RFC**
2024 with Committed Development (existing junction)	7	80	0.89
2024 with Committed Development plus Proposed Development (existing junction)	43	403	1.11
2024 with Committed Development plus Proposed Development (with mitigation)	8	80	0.91
Difference (mitigation comparison with existing)	+1	0	+0.02
Percentage difference	+14.3%	0%	+2.2%

Table 9.13: Improved B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road Double Roundabout Junctions 9 Results – PM Peak Hour (17:00 – 18:00)

Scenario	Harp Hill Approach		
	Max Queue (vehicles)	**Max Delay (seconds / vehicle)**	**Max RFC**
2024 with Committed Development (existing junction)	2	19	0.60
2024 with Committed Development plus Proposed Development (existing junction)	2	23	0.67
2024 with Committed Development plus Proposed Development (with mitigation)	1	15	0.58
Difference (mitigation comparison with existing)	-1	-4	-0.02
Percentage difference	-50%	-21.1%	-3.3%

9.5.18 Without mitigation, the Harp Hill approach to the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout, is predicted to have a Maximum RFC of over 1 in the AM peak hour with the Proposed Development. With mitigation, the maximum RFC is predicted to be 0.91 in the AM peak hour and 0.58 in the PM peak hour, with the Proposed Development. Driver Delay (Maximum Delay in seconds / vehicle) on the Harp Hill approach with the Proposed Development and mitigation is the same as the 2024 scenario without the Proposed Development and the existing junction in the AM peak hour and is reduced in the PM peak hour.

9.5.19 With mitigation, the Magnitude of Change on the Harp Hill approach, in percentage terms, reduces from **High** to **Negligible** in the AM peak hour and remains **Low** in the PM peak hour. The Sensitivity of the Receptor is **Medium**. Applying the Assessment Matrix, the effect on this junction would be **Negligible** in the AM peak hour and **Minor to Moderate Beneficial** in the PM peak hour. A Minor Beneficial effect is defined as a **"Perception of changing conditions e.g. reduction in delay"**. A Moderate Beneficial effect is defined as an **"Increased perception of changing conditions that may delay the need for planned modifications to off-site infrastructure"**.

9.6 CUMULATIVE AND IN-COMBINATION EFFECTS

9.6.1 It is necessary to assess the effects of the Proposed Development taking in account the potential cumulative and in-combination effects as a result of other third party developments in the vicinity of the Application Site. The following committed developments have been considered as part of the EIA transport assessment:

- Bouncers Lane (Application Ref. 18/01527/REM)
- Cromwell Court (Application Ref. 18/02581/FUL)
- GCHQ applications

- GCHQ – Phase 1 (Application Ref. 06/00352/REM)
- GCHQ – Phase 1 (Application Ref. 06/00380/REM)
- GCHQ – Phase 2 (Application Ref. 07/01296/REM)
- GCHQ – Phase 2 (Application Ref. 07/01465/REM)
- GCHQ – Phase 3 (Application Ref. 13/01683/REM)

9.6.2 The location of these committed development are shown on the Cumulative Plan (**Figure 2.1**).

Cumulative Effects

9.6.3 As The Assessment of Likely Significant Effects - Operation section above sets out the scenarios assessed and explains that committed development is included in the 2024 future baseline. The cumulative impact of these committed developments has been considered as follows.

Bouncers Lane (Application Ref. 18/01527/REM)

9.6.4 The Bouncers Lane proposal is for 54 dwellings. The Transport Assessment for the outline planning application for 58 dwellings calculated that the development would have a net impact of -2 and +5 two-way trips during the AM and PM peak hours, respective, when off-set against the lawful employment land use. Therefore the impact of the development proposals, in transport terms, is considered to be not significant.

9.6.5 However, as the site is currently redundant, the 2019 traffic surveys would not have recorded any traffic flows to/from the site and therefore, technically, the development would actually result in an increase in traffic flows against this baseline. The Transport Assessment for the outline planning application predicts that the proposed development of 58 dwellings would generate in the order of 31 two-way trips during the peak hours. To be robust, this assessment has included for the development explicitly, with the predicted peak hour traffic generation based on the Transport Assessment and the trip distribution across the wider network based on the 2019 junction turning count surveys.

Cromwell Court (Application Ref. 18/02581/FUL)

9.6.6 The Cromwell Court proposal comprises demolition of the existing dwelling and construction of 8 new self and custom build dwellings. The Transport Statement calculated that the development would generate in the order of 3 – 4 two-way trips during the peak hours, and concluded that the impact would not be significant. It is considered that the impact of this development would be negligible and no further assessment is required.

GCHQ applications (Application Ref. Various)

9.6.7 The GCHQ site obtained outline planning permission is 2003 and is now substantially built out and occupied. Therefore traffic generation from all phases of the development will be included in the 2019 baseline traffic surveys. No further assessment is required.

9.6.8 The cumulative effect of the committed development in-combination with the Proposed Development has been assessed in the 2024 with Committed Development plus Proposed Development scenario *(Scenario 3)*. Therefore the overall cumulative effect on Transport and Access is as assessed in the Assessment of Likely Significant Effects - Operation section above in relation to the 2024 with Committed Development plus Proposed Development scenario *(Scenario 3)*.

In-Combination Effects

9.6.9 The potential effects on air quality arising from traffic associated with the Proposed Development are addressed in Chapter 10 on Air Quality. The potential effects on noise arising from traffic associated with the Proposed Development are addressed in Chapter 11 on Noise and Vibration.

9.6.10 An Interim Residential Travel Plan has also been prepared as a guide to managing travel to and from the Proposed Development. This sets out measures to encourage travel by sustainable modes rather than single occupancy private car, in order to mitigate the potential effects of travel associated with the Proposed Development on Climate Change.

9.7 SUMMARY

Introduction

9.7.1 The likely significant effects of the Proposed Development in terms of transport and access have been considered. The proposed development will give rise to increased travel demand once occupied. It will also generate construction related traffic during the construction period.

9.7.2 A comprehensive Transport Assessment has been prepared. The Transport Assessment examines the transport effects of the Proposed Development on the local transport system and provides the basis for this assessment. An Interim Residential Travel Plan has also been prepared as a guide to managing travel to and from the Proposed Development.

Baseline Conditions

9.7.3 The Application Site comprises an area of approximately 14.9 hectares of land at Oakley Farm, Cheltenham, and it is located north of Harp Hill, approximately 3km east of Cheltenham town centre. It is bounded by Harp Hill to the south, existing residential development to the west and north, and further residential development and Hewlett's Reservoir site to the east. Cheltenham Footpath 86, a Public Right of Way, routes along the western boundary connecting Harp Hill with the B4075 Priors Road, via the existing farm access. The farm access extends eastwards from the B4075 Priors Road along the northern extent of the site.

9.7.4 Collision data have been obtained from GCC for the roads in the vicinity of the Application Site. The collision data covers the 5-year period from 1 January 2014 to 31 December 2018. There were no collisions recorded within the EIA transport assessment study area over the five year assessment period, which includes Harp Hill, the B4075 Priors Road in the vicinity of the site, and the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout. Overall it is considered that the collision records do not point to any existing highway safety issues which require more detailed examination as part of the EIA transport assessment.

9.7.5 The nearest bus stops to the Application Site are located in the existing built up area to the north west of the Application Site in the vicinity of Sainsbury's on Priors Road and in the vicinity of the Community Centre on Whaddon Road. Bus routes Q and P provide a regular circular town route, via the town centre, and both operate on a 120 minute frequency. Bus route A offers a more frequent service, which also serves Cheltenham town centre, but also provides longer distance travel options to destinations including GCHQ, a key employment site. The service operates at a frequency of approximately every 12 minutes during the week and every 15 – 20 minutes at weekends.

9.7.6 Cheltenham Spa Railway Station is located approximately 4.6km from the centre of the Application Site. Cheltenham Spa has excellent rail links to destinations across the country, including hourly services to destinations including Cardiff Central, London Paddington, Birmingham and Nottingham, as well as to Bristol Temple Meads and Manchester Piccadilly. Services to Gloucester operate at a typical frequency of 2-4 services per hour.

Likely Significant Effects

9.7.7 Construction activities will include the building of the residential dwellings plus the civil engineering works associated with the construction of the new infrastructure, including the new site access junction and internal development roads, cycling and walking links, drainage attenuation features, and landscaping. It is estimated that on a typical day there may be in the order of 7 HGV trips per day, equating to on average 14 two-way HGV vehicle movements per day. This is equivalent to less than 2 HGV movements per hour. The effects of construction traffic, particularly HGVs, could be perceived by other road users to be **Minor Adverse**; however the construction period is only temporary and expected to be medium term in its effect.

9.7.8 The effect of the proposed development in 2024 with 250 dwellings occupied has been assessed since this gives the worst case for the effect on the local road network and thus represents a robust assessment.

9.7.9 The maximum effect in terms of percentage change in modelled link flows with the Proposed Development occurs on Harp Hill to the south of the Application Site. To the west of the new site access junction, Harp Hill is predicted to experience an 18.9% increase in traffic in the AM peak and a 20.9% increase in the PM peak, which equates to a **Low** Magnitude of Change. Further afield the predicted increase in traffic on highway links is well below 10%. Other than Harp Hill, no highway links meet the criteria for assessment set out in the Assessment Approach section above.

9.7.10 This level of increase in traffic is expected to have a **Minor to Moderate Adverse** effect on pedestrian movements (Severance, Pedestrian Delay, Pedestrian Amenity, and Fear and Intimidation), and a **Negligible** effect on Accidents and Safety, without mitigation.

9.7.11 In order to determine the effect of the Proposed Development in respect of Driver Delay, junction capacity analysis has been undertaken for the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout. It is highlighted that although Harp Hill is predicted to experience an increase in traffic flow of greater than 10%, the junction overall is likely to experience an increase in traffic flows in the order of 4.8% - 4.9% during the peak hours. Without mitigation, the effect on this junction would be **Major Adverse** in the AM peak hour and **Minor to Moderate Adverse** in the PM peak hour.

Mitigation and Enhancement

9.7.12 Mitigation measures will be implemented during construction in the form of controls imposed by planning conditions, health and safety legislation requirements and good construction site practices. As part of a Construction Management Plan or similar, a construction vehicle routeing regime for access to the construction site will be identified and agreed with the local highway authority to ensure that drivers of construction related vehicles do not use inappropriate routes.

9.7.13 The new site access junction on Harp Hill and the potential emergency access on the B4075 Priors Road will be designed in accordance with current standards and guidance to ensure that it is safe and suitable.

9.7.14 The internal site layout will be designed in a manner which facilitates walking and cycling, providing links to existing routes to allow good access for sustainable modes of transport. A shared pedestrian / cycleway link is proposed between the Proposed Development and Priors Road along the route of the existing farm access. Further pedestrian linkages are proposed to Harp Hill with cycle linkages to Harp Hill proposed via the new site access junction.

9.7.15 An Interim Residential Travel Plan has been prepared to encourage travel by sustainable modes.

9.7.16 The proposed mitigation / enhancement includes a financial contribution towards the introduction of a new section of footway and an uncontrolled pedestrian crossing facility on Harp Hill, and a controlled Toucan crossing facility and a new section of shared footway/cycleway on Priors Road. It is considered that these proposed measures would result in a **Minor –Moderate Beneficial** and **Moderate – Major Beneficial** effect, respectively, in terms of pedestrian and cycle movements on Harp Hill and Priors Road.

9.7.17 If required, a proportionate contribution will be made towards enhancement to bus services in the area.

9.7.18 With mitigation, the Magnitude of Change on the Harp Hill approach to the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout reduces from **High** to **Negligible** in the AM peak hour and remains **Low** in the PM peak hour. The effect on this junction with mitigation would be **Negligible** in the AM peak hour and **Minor to Moderate Beneficial** in the PM peak hour.

Conclusion

9.7.19 It is concluded that with the implementation of the mitigation and enhancement measures outlined, including the Interim Residential Travel Plan aimed at encouraging travel by sustainable modes, the additional traffic demand would be safely and satisfactorily accommodated on the local transport network.

9.7.20 The overall residual effect of the Proposed Development in transport terms is likely to be generally **Minor to Moderate Beneficial**.

Table 9.12: Summary of Effects, Mitigation and Residual Effects

Receptor/ Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation/ Enhancement Measures	Residual Effects ****
Construction								
Road users: pedestrians, cyclists, and drivers (Harp Hill)	Severance, pedestrian delay, pedestrian amenity, and fear and intimidation	Temporary	Medium	Negligible (Low)	Local - County	Negligible (Minor Adverse)	Construction Management Plan	Negligible (Minor Adverse)
Road users: drivers (Harp Hill and B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout)	Driver delay	Temporary	Medium	Negligible (Low)	Local - County	Negligible (Minor – Moderate Adverse)	Construction Management Plan	Negligible (Minor Adverse)
Road users: pedestrians, cyclists, and drivers (Harp Hill)	Accidents and Safety	Temporary	Medium	Negligible	Local	Negligible	-	Negligible
Operation								
Road users: pedestrians and cyclists (Harp Hill)	Severance, pedestrian delay, pedestrian amenity, and fear and intimidation	Permanent	Medium	Low	Local	Minor to Moderate Adverse	Provision of new section of footway and uncontrolled crossing on Harp Hill	Minor – Moderate Beneficial

Receptor/ Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation/ Enhancement Measures	Residual Effects ****
Road users: pedestrians and cyclists (Harp Hill and Priors Road)	Severance, pedestrian delay, pedestrian amenity, and fear and intimidation	Permanent	Medium	Low	Local	Minor to Moderate Adverse	Provision of controlled Toucan crossing on Priors Road and new section of shared footway/cycleway	Moderate – Major Beneficial
Road users: drivers (B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road double roundabout)	Driver delay	Permanent	Medium	High (AM) / Low (PM)	Local	Major Adverse (AM) / Minor to Moderate Adverse (PM)	Minor highway improvements to junction layout	Negligible (AM) / Minor to Moderate Beneficial (PM)
Road users: pedestrians, cyclists, and drivers (Harp Hill)	Accidents and Safety	Permanent	Negligible	Medium	Local	Negligible	-	Negligible
Cumulative and In-combination								
-	-	-	-	-	-	-	-	-

10 AIR QUALITY

10.1 INTRODUCTION

10.1.1 This chapter considers the likely significant effects associated with the Proposed Development in terms of air quality. The chapter is supported by **Appendices 10.1** to **10.5**.

10.1.2 The Proposed Development will lead to an increase in traffic on the local roads, which may lead to air quality effects at sensitive receptors. New residential properties within the Proposed Development may also be subject to air quality effects resulting from road traffic emissions from the adjacent road network. The main air pollutants of concern related to traffic emissions are nitrogen dioxide and fine particulate matter (PM_{10} and $PM_{2.5}$).

10.1.3 The potential for the construction activities to affect both existing and new properties has also been assessed. The main pollutants of concern related to construction activities are dust and PM_{10}.

10.1.4 This chapter describes existing local air quality conditions (2018), and the predicted air quality in the future assuming that the Proposed Development does, or does not proceed. The assessment of traffic-related air quality effects focuses on 2024, which is the anticipated year of opening of the Proposed Development. The assessment of construction dust effects focuses on the anticipated duration of the works.

10.1.5 This chapter and appendices have been prepared taking into account all relevant local and national guidance and regulations, and follows a methodology agreed with CBC.

10.2 ASSESSMENT APPROACH

Methodology

Consultation

10.2.1 The assessment follows a methodology agreed via email correspondence between the Environmental Health Officer at Cheltenham Borough Council) and Air Quality Consultants held during October 2019.

Existing Conditions

10.2.2 Existing sources of emissions within the study area have been defined using a number of approaches. Industrial and waste management sources that may affect the area have been identified using Defra's Pollutant Release and Transfer Register[1]. Local sources have also been identified through examination of the Council's Air Quality Review and Assessment reports.

10.2.3 Information on existing air quality has been obtained by collating the results of monitoring carried out by the local authority. The background concentrations across the study area have been defined using the national pollution maps published by Defra[2]. These cover the whole country on a 1x1 km grid.

10.2.4 Exceedances of the annual mean EU limit value for nitrogen dioxide in the study area have been identified using the maps of roadside concentrations published by

[1] Defra 2019 UK Pollutant Release and Transfer Register, http://prtr.defra.gov.uk/map-search

[2] Defra 2019 Local Air Quality Management (LAQM) Support Website, http://laqm.defra.gov.uk/

Defra[3]. These maps are used by the UK Government, together with the results from national Automatic Urban and Rural Network (AURN) monitoring sites that operate to EU data quality standards, to report exceedances of the limit value to the EU. The national maps of roadside PM_{10} and $PM_{2.5}$ concentrations[4], which are available for the years 2009 to 2017, show no exceedances of the limit values anywhere in the UK in 2017.

Construction Impacts

10.2.5 The construction dust assessment considers the potential for impacts within 350 m of the site boundary; or within 50 m of roads used by construction vehicles. The assessment methodology is that provided by the Institute of Air Quality Management (IAQM[5])[6]. This follows a sequence of steps. Step 1 is a basic screening stage, to determine whether the more detailed assessment provided in Step 2 is required. Step 2a determines the potential for dust to be raised from on-site works and by vehicles leaving the site. Step 2b defines the sensitivity of the area to any dust that may be raised. Step 2c combines the information from Steps 2a and 2b to determine the risk of dust impacts without appropriate mitigation. Step 3 uses this information to determine the appropriate level of mitigation required to ensure that there should be no significant impacts. **Appendix 10.1** explains the approach in more detail.

Road Traffic Impacts

Sensitive Locations

10.2.6 Concentrations of nitrogen dioxide, PM_{10} and $PM_{2.5}$ have been predicted at a number of locations close to the Proposed Development. Receptors have been identified to represent worst-case exposure at these locations. When selecting these receptors, particular attention has been paid to assessing impacts close to junctions, where traffic may become congested, and where there is a combined effect of several road links. The receptors have been located on the façades of the properties closest to the roads.

10.2.7 Thirty existing residential properties have been identified as receptors for the assessment. In addition, four locations have been identified to represent worst-case exposure within the new development itself, adjacent to Harp Hill. These locations are shown in **Figure 10.1**. Predictions were made at a height representing ground floor exposure.

Assessment Scenarios

10.2.8 Predictions of nitrogen dioxide, PM_{10} and $PM_{2.5}$ concentrations have been made for a base year (2018), and the proposed year of opening (2024). For 2024, predictions have been made assuming both that the development does proceed (With Scheme), and does not proceed (Without Scheme). The future baseline includes traffic associated with the identified cumulative developments, described in **Chapter 2: Assessment Methodology**.

10.2.9 In addition to the set of 'official' predictions (those from Defra's Emission Factor Toolkit (EFT)), a sensitivity test has been carried out for nitrogen dioxide that involves

[3] Defra 2019 2019 NO_2 projections data (2017 reference year),

https://uk-air.defra.gov.uk/library/no2ten/2019-no2-pm-projections-from-2017-data

[4] Defra 2019 UK Ambient Air Quality Interactive Map, https://uk-air.defra.gov.uk/data/gis-mapping

[5] The IAQM is the professional body for air quality practitioners in the UK

[6] IAQM 2016 Guidance on the Assessment of Dust from Demolition and Construction v1.1,

http://iaqm.co.uk/guidance/

assuming higher nitrogen oxides emissions from some diesel vehicles than have been predicted by Defra, using AQC's Calculator Using Realistic Emissions for Diesels (CURED v3A) tool[7].

Modelling Methodology

10.2.10 Concentrations have been predicted using the ADMS-Roads dispersion model, with vehicle emissions derived using Defra's latest EFT (v9.0)[2]. Details of the model inputs and the model adjustment are provided in **Appendix 10.2**, together with the method used to derive current and future year background nitrogen dioxide concentrations.

Traffic Data

10.2.11 Traffic data for the assessment have been provided by PFA Consulting Ltd, who have undertaken the Transport Assessment for the Proposed Development. Further details of the traffic data used in this assessment are provided in **Appendix 10.2**.

Assessment of Significance

Construction Dust Significance

10.2.12 Guidance from IAQM[6] is that, with appropriate mitigation in place, the impacts of construction dust will be 'not significant'. The assessment thus focuses on determining the appropriate level of mitigation so as to ensure that impacts will normally be 'not significant'.

Operational Significance

10.2.13 There is no official guidance in the UK on how to describe air quality impacts, nor how to assess their significance. The approach developed jointly by Environmental Protection UK (EPUK) and IAQM[8] has therefore been used. This includes defining descriptors of the impacts at individual receptors, which take account of the percentage change in concentrations relative to the relevant air quality objective, rounded to the nearest whole number, and the absolute concentration relative to the objective. The overall significance of the air quality impacts is determined using professional judgement, taking account of the impact descriptors. Full details of the EPUK/IAQM approach are provided in **Appendix 10.3**. The approach includes elements of professional judgement, and the experience of the consultants preparing the report is set out in **Appendix 10.4**.

10.2.14 It is important to differentiate between the terms impact and effect with respect to the assessment of air quality. The term impact is used to describe a change in pollutant concentration at a specific location. The term effect is used to describe an environmental response resulting from an impact, or series of impacts. Within this chapter, the air quality assessment has used published guidance and criteria described in the following sections to determine the likely air quality impacts at a number of sensitive locations. The potential significance of effects has then been determined by professional judgement, based on the frequency, duration and magnitude of predicted impacts and their relationship to appropriate air quality objectives.

[7] AQC 2017 CURED v3A, http://www.aqconsultants.co.uk/Resources/Download-Reports.aspx

[8] Moorcroft and Barrowcliffe et al 2017 Land-Use Planning & Development Control: Planning For Air Quality v1.2, IAQM, London http://iaqm.co.uk/guidance/

Legislative and Policy Framework

Air Quality Strategy

10.2.15 The Air Quality Strategy[9] published by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives. Local authorities are seen to play a particularly important role. The strategy describes the Local Air Quality Management (LAQM) regime that has been established, whereby every authority has to carry out regular reviews and assessments of air quality in its area to identify whether the objectives have been, or will be, achieved at relevant locations, by the applicable date. If this is not the case, the authority must declare an Air Quality Management Area (AQMA), and prepare an action plan which identifies appropriate measures that will be introduced in pursuit of the objectives.

Clean Air Strategy 2019

10.2.16 The Clean Air Strategy[10] sets out a wide range of actions by which the UK Government will seek to reduce pollutant emissions and improve air quality. Actions are targeted at four main sources of emissions: Transport, Domestic, Farming and Industry. At this stage, there is no straightforward way to take account of the expected future benefits to air quality within this assessment.

Reducing Emissions from Road Transport: Road to Zero Strategy

10.2.17 The Office for Low Emissions Vehicles (OLEV) and Department for Transport (DfT) published a Policy Paper[11] in July 2018 outlining how the government will support the transition to zero tailpipe emissions from conventional vehicles during the transition. This paper affirms the Government's pledge to end the sale of new conventional petrol and diesel cars and vans by 2040, and states that the Government expects the majority of new cars and vans sold to be 100% zero tailpipe emission and all new cars and vans to have significant zero tailpipe emission capability by this year, and that by 2050 almost every car and van should have zero tailpipe emissions. It states that the Government wants to see at least 50%, and as many as 70%, of new car sales, and up to 40% of new van sales, being ultra-low emission by 2030.

10.2.18 The paper sets out a number of measures by which Government will support this transition, but is clear that Government expects this transition to be industry and consumer led. If these ambitions are realised then road traffic-related NOx emissions can be expected to reduce significantly over the coming decades, likely beyond the scale of reductions forecast in the tools utilised in carrying out this air quality assessment.

[9] Defra 2007 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Defra

[10] Defra 2019 Clean Air Strategy 2019, https://www.gov.uk/government/publications/clean-air-strategy-2019

[11] DfT 2018 The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy

Planning Policy

National Policies

10.2.19 The National Planning Policy Framework (NPPF)[12] sets out planning policy for England. It states that the purpose of the planning system is to contribute to the achievement of sustainable development, and that the planning system has three overarching objectives, one of which is an environmental objective:

> **"to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy".**

10.2.20 To prevent unacceptable risks from air pollution, the NPPF states that:

> **"Planning policies and decisions should contribute to and enhance the natural and local environment by…preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air quality".**

and

> **"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development."**

10.2.21 More specifically on air quality, the NPPF makes clear that:

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

[12] Ministry of Housing, Communities and Local Government 2019 National Planning Policy Framework, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/779764/NPPF_Feb_2019_web.pdf

10.2.22 The NPPF is supported by Planning Practice Guidance (PPG)[13], which includes guiding principles on how planning can take account of the impacts of new development on air quality. The PPG states that

> **"Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with EU Limit Values" and "It is important that the potential impact of new development on air quality is taken into account … where the national assessment indicates that relevant limits have been exceeded or are near the limit".**

10.2.23 The role of the local authorities is covered by the LAQM regime, with the PPG stating that local authority Air Quality Action Plans **"identify measures that will be introduced in pursuit of the objectives"**. In addition, the PPG makes clear that **"…dust can also be a planning concern, for example, because of the effect on local amenity"**.

10.2.24 The PPG states that:

> **"Whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate air quality impact in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation (including that applicable to wildlife)".**

10.2.25 The PPG sets out the information that may be required in an air quality assessment, making clear that:

> **"Assessments should be proportional to the nature and scale of development proposed and the level of concern about air quality".**

10.2.26 It also provides guidance on options for mitigating air quality impacts, as well as examples of the types of measures to be considered. It makes clear that:

> **"Mitigation options where necessary, will depend on the proposed development and should be proportionate to the likely impact".**

Local Transport Plan

10.2.27 Cheltenham Borough Council has adopted the Cheltenham Transport Plan[14], one of the purposes of which is to improve traffic management and air quality. The plan comprises four phases, all of which were completed by August 2019.

Local Policies

10.2.28 Cheltenham Borough Council is currently in the process of developing a new Cheltenham Plan. The draft Cheltenham Plan (Pre-Submission Version)[15] does not

[13] Ministry of Housing, Communities & Local Government 2019 Planning Practice Guidance, https://www.gov.uk/government/collections/planning-practice-guidance

[14] Cheltenham Borough Council 2019 Cheltenham Transport Plan, https://www.cheltenham.gov.uk/transport-plan

include any relevant policies relating to air quality. Until the new Cheltenham Plan is adopted a number of saved policies from the current Cheltenham Borough Local Plan[16] are in force, including one relevant policy; Policy CP 3 'Sustainable Environment' which states that **"Development will be permitted only where it would…not give rise to harmful levels of pollution…to…air…".**

10.2.29 The Joint Core Strategy (JCS) Plan[17] was developed by Cheltenham Borough Council, Gloucester City Council and Tewkesbury Borough Council, and was adopted by all three Councils in December 2017. The plan is currently undergoing a review, but in its current form contains the following four relevant policies. Policy SD3 'Sustainable Design and Construction' states that **"Development proposals will demonstrate how they contribute to the aims of sustainability by…avoiding the unnecessary pollution of air… In doing so, proposals (including changes to existing buildings) will be expected to achieve national standards…".**

10.2.30 Policy D4 'Design Requirements' states that:

> **"Where appropriate, proposals for development…will need to clearly demonstrate how the following principles have been incorporated:**
>
> **…New development should enhance comfort, convenience and enjoyment through…the avoidance or mitigation of potential disturbances, including…pollution…**
>
> **…New development…should:…incorporate, where feasible, facilities for charging plug-in and other ultra-low emission vehicles…";**

10.2.31 As part of Policy D4 'Design Requirements', Table SD4d sets out the requirement that a design brief, should one be required, should demonstrate **"…How sustainability matters addressed by other policies of the development plan and the NPPF and national PPG – such as those relating to…pollution… - have been taken into account…"**.

10.2.32 Policy SD14 'Health and Environmental Quality' states that:

> **"High-quality development should protect and seek to improve environmental quality. Development should not create or exacerbate conditions that could impact on human health or cause health inequality. New development must:**
>
> **…Result in no unacceptable levels of air…pollution…either alone or cumulatively, with respect to relevant national and EU limit values;**
>
> **Result in no exposure to unacceptable risk from existing or potential sources of pollution. For example, by avoiding placing sensitive uses in locations where national or EU limit values are exceeded, or by incorporating acceptable mitigation measures into development…";** and

[15] Cheltenham Borough Council 2018 Cheltenham Plan; Pre-Submission Version (Regulation 19)

[16] Cheltenham Borough Council 2006 Cheltenham Borough Local Plan; Second Review

[17] Gloucester, Cheltenham and Tewkesbury 2017 Joint Core Strategy 2011 - 2031

10.2.33 Policy INF1 'Transport Network' states that **"...Developers will be required to assess the impact of proposals on the transport network through a Transport Assessment. The assessment will demonstrate the impact, including cumulative impacts, of the prospective development on...atmospheric pollution within the zone of influence of the development..."**.

Air Quality Action Plan

National Air Quality Plan

10.2.34 Defra has produced an Air Quality Plan to tackle roadside nitrogen dioxide concentrations in the UK[18]; a supplement to the 2017 Plan[19] was published in October 2018 and sets out the steps Government is taking in relation to a further 33 local authorities where shorter-term exceedances of the limit value were identified. Alongside a package of national measures, the 2017 Plan and the 2018 Supplement require those identified English Local Authorities (or the GLA in the case of London Authorities) to produce local action plans and/or feasibility studies. These plans and feasibility studies must have regard to measures to achieve the statutory limit values within the shortest possible time, which may include the implementation of a Clean Air Zone (CAZ). There is currently no straightforward way to take account of the effects of the 2017 Plan or 2018 Supplement in the modelling undertaken for this assessment; however, consideration has been given to whether there is currently, or is likely to be in the future, a limit value exceedance in the vicinity of the proposed development. This assessment has principally been carried out in relation to the air quality objectives, rather than the EU limit values that are the focus of the Air Quality Plan.

Local Air Quality Action Plan

10.2.35 Cheltenham Borough Council has declared a borough wide AQMA, for exceedances of the annual mean nitrogen dioxide objective. The Council has developed an Air Quality Action Plan[20], which sets out actions to manage road traffic and reduce vehicle emissions to improve air quality within the AQMA. There is no practical way to take account of the benefits to air quality brought about by these improvements within this assessment.

Assessment Criteria

10.2.36 The Government has established a set of air quality standards and objectives to protect human health. The 'standards' are set as concentrations below which effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality

[18] Defra 2017 Air quality plan for nitrogen dioxide (NO2) in the UK, https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017

[19] Defra 2018 Supplement to the UK plan for tackling roadside nitrogen dioxide concentrations, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/746100/air-quality-no2-plan-supplement.pdf

[20] Cheltenham Borough Council 2014 Air Quality Action Plan

(England) Regulations (2000)[21] and the Air Quality (England) (Amendment) Regulations (2002)[22].

10.2.37 The objectives for nitrogen dioxide and PM_{10} were to have been achieved by 2005 and 2004 respectively, and continue to apply in all future years thereafter. The $PM_{2.5}$ objective is to be achieved by 2020. Measurements across the UK have shown that the 1-hour nitrogen dioxide objective is unlikely to be exceeded where the annual mean concentration is below 60 $\mu g/m^3$ [23]. Therefore, 1-hour nitrogen dioxide concentrations will only be considered if the annual mean concentration is above this level. Measurements have also shown that the 24-hour PM_{10} objective could be exceeded at roadside locations where the annual mean concentration is above 32 $\mu g/m^3$ [23]. The predicted annual mean PM_{10} concentrations are thus used as a proxy to determine the likelihood of an exceedance of the 24-hour mean PM_{10} objective. Where predicted annual mean concentrations are below 32 $\mu g/m^3$ it is unlikely that the 24-hour mean objective will be exceeded.

10.2.38 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. Defra explains where these objectives will apply in its Local Air Quality Management Technical Guidance[23]. The annual mean objectives for nitrogen dioxide and PM_{10} are considered to apply at the façades of residential properties, schools, hospitals etc.; they do not apply at hotels. The 24-hour objective for PM_{10} is considered to apply at the same locations as the annual mean objective, as well as in gardens of residential properties and at hotels. The 1-hour mean objective for nitrogen dioxide applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.

10.2.39 The European Union has also set limit values for nitrogen dioxide, PM_{10} and $PM_{2.5}$[24]. The limit values for nitrogen dioxide are the same numerical concentrations as the UK objectives, but achievement of these values is a national obligation rather than a local one. In the UK, only monitoring and modelling carried out by UK Central Government meets the specification required to assess compliance with the limit values. Central Government does not normally recognise local authority monitoring or local modelling studies when determining the likelihood of the limit values being exceeded, unless such studies have been audited and approved by Defra and DfT's Joint Air Quality Unit (JAQU).

10.2.40 The relevant air quality criteria for this assessment are provided in **Table 10.1**.

[21] The Air Quality (England) Regulations 2000 Statutory Instrument 928 (2000), HMSO, http://www.legislation.gov.uk/uksi/2000/928/contents/made

[22] The Air Quality (England) (Amendment) Regulations 2002, Statutory Instrument 3043 (2002), HMSO, https://www.legislation.gov.uk/uksi/2002/3043/contents/made

[23] Defra 2018 Review & Assessment: Technical Guidance LAQM.TG16 February 2018 Version, Defra, https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf

[24] The European Parliament and the Council of the European Union 2008 Directive 2008/50/EC of the European Parliament and of the Council, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0050

Table 10.1: Air Quality Criteria for Nitrogen Dioxide, PM_{10} and $PM_{2.5}$

Pollutant	Time Period	Objective
Nitrogen Dioxide	1-hour Mean	200 µg/m^3 not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m^3
Fine Particles (PM_{10})	24-hour Mean	50 µg/m^3 not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m^3 [b]
Fine Particles ($PM_{2.5}$) [a]	Annual Mean	25 µg/m^3

[a] The $PM_{2.5}$ objective, which is to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.
[b] A proxy value of 32 µg/m^3 as an annual mean is used in this assessment to assess the likelihood of the 24-hour mean PM_{10} objective being exceeded. Measurements have shown that, above this concentration, exceedances of the 24-hour mean PM_{10} objective are possible[23].

Construction Dust Criteria

10.2.41 There are no formal assessment criteria for dust. In the absence of formal criteria, the approach developed by the IAQM[6] has been used. Full details of this approach are provided in **Appendix 10.1**.

Scoping Criteria

10.2.42 The assessment considers:

- the effects of the operation of the Proposed Development on concentrations of nitrogen dioxide, PM_{10} and $PM_{2.5}$ from road traffic at nearby existing receptors in the proposed year of opening;
- the effects of existing sources on future residents of the Proposed Development itself; and
- the impacts of the construction of the Proposed Development

Limitations to the Assessment

10.2.43 There are many components that contribute to the uncertainty of modelling predictions. The road traffic emissions model used in this assessment is dependent upon the traffic data that have been input, which will have inherent uncertainties associated with them. There are then additional uncertainties, as the model is required to simplify real-world conditions into a series of algorithms.

10.2.44 An important stage in the process is model verification, which involves comparing the model output with measured concentrations (see **Appendix A10.2**). Because the model has been verified and adjusted, there can be reasonable confidence in the prediction of base year (2018) concentrations.

10.2.45 Predicting pollutant concentrations in a future year will always be subject to greater uncertainty. It is necessary to rely on a series of projections provided by DfT and Defra as to what will happen to traffic volumes, background pollutant concentrations and vehicle emissions.

10.2.46 European type approval ('Euro') standards for vehicle emissions apply to all new vehicles manufactured for sale in Europe. These standards have, over many years, become progressively more stringent and this is one of the factors that has driven reductions in both predicted and measured pollutant concentrations over time.

10.2.47 Historically, the emissions tests used for type approval were carried out within laboratories and were quite simplistic. They were thus insufficiently representative

of emissions when driving in the real world. For a time, this resulted in a discrepancy, whereby nitrogen oxides emissions from new diesel vehicles reduced over time when measured within the laboratory, but did not fall in the real world. This, in turn, led to a discrepancy between models (which predicted improvements in nitrogen dioxide concentrations over time) and measurements (which very often showed no improvements year-on-year).

10.2.48 Recognition of these discrepancies has led to changes to the type approval process. Vehicles are now tested using a more complex laboratory drive cycle and also through 'Real Driving Emissions' (RDE) testing, which involves driving on real roads while measuring exhaust emissions. For Heavy Duty Vehicles (HDVs), the new testing regime has worked very well and NOx emissions from the latest vehicles (Euro VI[25]) are now very low when compared with those from older models[26].

10.2.49 For Light Duty Vehicles (LDVs), while the latest (Euro 6) emission standard has been in place since 2015, the new type-approval testing regime only came into force in 2017. Despite this delay, earlier work by AQC[27] showed that Euro 6 diesel cars manufactured prior to 2017 tend to emit significantly less NOx than previous (Euro 5 and earlier) models. Given the changes to the testing regime, it is reasonable to expect that diesel cars and vans registered for type approval since 2017 will, on average, generate even lower NOx emissions.

10.2.50 As well as reviewing information on the emissions from modern diesel vehicles in the real world[27], AQC has also reviewed the assumptions contained within Defra's latest EFT (v9.0)[28]. One point of note is that the EFT makes a range of assumptions, which appear to be very conservative, regarding the continued use of diesel cars into the future and the relatively slow uptake of non-conventional (e.g. electric) vehicles[29]. Thus, despite previous versions of Defra's EFT being over-optimistic regarding future-year predictions, it is not unreasonable to consider that EFT v9.0 might under-state the scale of reductions over coming years (i.e. over-predict future-year traffic emissions).

10.2.51 Overall, it is considered that, for assessment years prior to 2021, the EFT provides a robust method of calculating emissions. While there is still some uncertainty regarding any predictions of what will occur in the future, there are no obvious reasons to expect predictions made using the EFT to under-predict concentrations in the future up to and including 2020.

10.2.52 For assessment years beyond 2020, EFT v9.0 makes additional assumptions regarding the expected performance of diesel cars and vans registered for type approval beyond this date, reflecting further planned changes to the type approval testing. While there is currently no reason to disbelieve these assumptions, it is sensible to consider the possibility that this future-year technology might be less effective than has been assumed. A sensitivity test has thus been carried out using AQC's CURED v3A

[25] Euro VI refers to HDVs while Euro 6 refers to LDVs

[26] ICCT 2017 NOx emissions from heavy-duty and light-duty diesel vehicles in the EU: Comparison of real-world performance and current type-approval requirements, http://www.theicct.org/nox-europe-hdv-ldv-comparison-jan2017

[27] AQC 2016 Emissions of Nitrogen Oxides from Modern Diesel Vehicles, http://www.aqconsultants.co.uk/getattachment/Resources/Download-Reports/Emissions-of-Nitrogen-Oxides-from-Modern-Diesel-Vehicles-210116.pdf.aspx

[28] AQC 2019 Initial Comparison of EFT v9 with EFT v8 and CURED v3A, http://www.aqconsultants.co.uk/AQC/media/Reports/Initial-Comparison-of-EFT-v9-with-EFT-v8-and-CURED-v3A-290519.pdf

[29] AQC 2018 Development of the CURED v3A Emissions Model, http://www.aqconsultants.co.uk/Resources/Download-Reports.aspx

model[7], which assumes that this, post-2020, technology does not deliver any benefits. Further details of CURED v3A are provided in a supporting report prepared by AQC[29].

10.2.53 It is also worth noting that the fleet projections incorporated within the EFT do not appear to reflect the Government's ambitions as set out in the Road to Zero Strategy (see Paragraphs 10.2.17 and 10.2.18), predicting a relatively low proportion of zero tailpipe emission vehicles in years up to and including 2030. If the Government's ambitions relating to the uptake of zero tailpipe emission vehicles are realised then the EFT's emissions projections for NOx are likely to be overly-conservative for the latter part of the 2020s, if not the entire decade.

10.2.54 It must also be borne in mind that the predictions in 2024 are based on worst-case assumptions regarding the increase in traffic flows, such that all committed developments and the Proposed Development, are assumed to be fully operational. This will have overestimated the traffic emissions, and hence the 2024 concentrations and impacts.

10.3 BASELINE CONDITIONS

Site Description and Context

Industrial sources

10.3.1 A search of the UK Pollutant Release and Transfer Register[1] has not identified any significant industrial or waste management sources that are likely to affect the Proposed Development, in terms of air quality.

Air Quality Review and Assessment

10.3.2 CBC has investigated air quality within its area as part of its responsibilities under the local air quality management regime. In December 2008, an AQMA (Cheltenham AQMA) was declared for exceedances of the annual mean nitrogen dioxide objective covering an area encompassing the High Street from the junction at Grosvenor Street through to lower part of Bath Road. In November 2011, the AQMA was expanded to cover the entire borough, encompassing areas of exceedance as well as areas where the objective may be met. The Application Site is located within the Cheltenham AQMA.

10.3.3 In terms of PM_{10}, CBC concluded that there are no exceedances of the objectives. It is therefore highly unlikely that existing PM_{10} levels will exceed the objectives within the study area.

Local Air Quality Monitoring

10.3.4 CBC operates one automatic monitor (site CM1) which is located adjacent to the junction between Swindon Road and St George's Street, and is approximately 2 km from the Application Site. The Council also operates a number of nitrogen dioxide diffusion tube monitoring sites, eight of which are located within approximately 1.5 km of the Application Site. Results for the years 2014 to 2018 are summarised in **Table 10.2**, and their locations are shown in **Figure 10.2**.

10.3.5 No exceedances of the annual mean or the 1-hour mean objectives have been measured at the automatic monitoring site in recent years. Measured concentrations at the diffusion tube monitoring sites have been below the annual mean objective at all sites since 2016. None of the diffusion tube sites have measured concentrations greater than 60 $\mu g/m^3$, indicating that it is unlikely that the 1-hour mean objective has been exceeded at any of these locations. Concentrations have reduced overall between 2014 and 2018 at all sites for which five years data are available.

10.3.6 No monitoring of PM_{10} or $PM_{2.5}$ concentrations is undertaken by CBC.

Table 10.2: Summary of Nitrogen Dioxide (NO_2) Monitoring (2014-2018)

Site ID	Site Type	Location	2014	2015	2016	2017	2018
Automatic Monitor – Annual Mean (µg/m^3)							
CM1	Roadside	St George's Street	35.0	35.0	34.0	36.0	32.7
Objective			**40**				
Automatic Monitor – No. of Hours >200 µg/m^3							
CM1	Roadside	St George's Street	0	0	0	0	0
Objective			**18**				
Diffusion Tubes – Annual Mean (µg/m^3)							
11	Roadside	Portland Street	35.2	36.8	35.7	35.9	32.6
12	Roadside	Winchcombe / Fairview	39.3	33.0	32.2	32.8	31.8
13	Kerbside	54 Albion Street	-	-	-	34.8	31.3
14	Roadside	2 London Road	**40.1**	40.0	38.0	37.1	37.4
15	Roadside	YMCA High Street	35.2	34.5	32.9	31.9	29.1
16	Roadside	8a Bath Road	**40.8**	**41.1**	38.4	38.0	34.5
18	Roadside	81 London Road	**41.8**	**41.4**	39.6	38.4	37.3
27	Roadside	St Lukes College Road	-	-	-	-	24.8
Objective			**40**				

N/A = not applicable. The range of values is for the different 1x1 km grid squares covering the study area.
[a] In line with Defra's forecasts.

Exceedances of EU Limit Value

10.3.7 There are no AURN monitoring sites within Cheltenham with which to identify exceedances of the annual mean nitrogen dioxide limit value. Defra's roadside annual mean nitrogen dioxide concentrations[30], which are used to report exceedances of the limit value to the EU, do not identify any exceedances within the study area in 2017 or in 2024. As such, there is considered to be no risk of a limit value exceedance in the vicinity of the Proposed Development by the time that it is operational.

10.3.8 As discussed in Paragraph 10.2.34, Defra has produced an Air Quality Plan[18] to tackle roadside nitrogen dioxide concentrations in the UK. Within this Plan, CBC is identified as having limit value exceedances in or beyond 2017, but not beyond 2020, thus the Plan does not require the authority to undertake any further action. However, a 2018 High Court judgement[31] declared the Plan unlawful with regard to its application to the 45 local authority areas in which exceedances are projected beyond 2017, but not beyond 2020. The judgement requires the 33 local authorities where exceedances are projected beyond 2018, of which CBC was found to be one, to also *"develop and implement a plan designed to deliver compliance in the shortest time possible"*. CBC is on this list due to exceedances of the EU limit value being identified alongside a stretch of Gloucester Road (A40).

[30] Defra 2019 Defra AURN Archive, https://uk-air.defra.gov.uk/interactive-map?network=aurn

[31] Royal Courts of Justice 2018 Judgement on Case No. CO/4922/2017

10.3.9 CBC has undertaken a feasibility study to deliver compliance with the nitrogen dioxide EU limit value in the shortest time possible[32]. This study demonstrates that the road link is already (marginally) compliant as a result of a measure that was implemented in 2015 (i.e. upgrading a large proportion of the Stagecoach bus fleet to Euro 6), however, in order to further decrease nitrogen dioxide concentrations along this road link, the plan proposes one additional measure (workplace travel plans). Taking into consideration the outcome of the feasibility study, and the considerable distance (over 4.5 km) between this stretch of Gloucester Road and the Application Site, limit value exceedances are unlikely to be affected by the proposed development.

Background Concentrations

10.3.10 Estimated background concentrations in the study area have been determined for 2018 and the opening year 2024 using Defra's 2017-based background maps[2]. The background concentrations are set out in **Table 10.3** and have been derived as described in **Appendix A10.2**. The background concentrations are all well below the objectives.

Table 10.3: Estimated Annual Mean Background Pollutant Concentrations in 2018 and 2024 (µg/m^3)

Year	NO_2	PM_{10}	$PM_{2.5}$
2018	10.0 – 16.9	12.2 – 14.4	8.4 – 10.1
2024 [a]	8.0 – 13.6	11.5 – 13.6	7.7 – 9.5
2024 Sensitivity Test [b]	7.0 – 13.2	N/A	N/A
Objectives	**40**	**40**	**25** [c]

N/A = not applicable. The range of values is for the different 1x1 km grid squares covering the study area.
[a] In line with Defra's forecasts.
[b] Assuming higher emissions from future diesel cars and vans, using CURED v3A[7].
[c] The $PM_{2.5}$ objective, which is to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

Baseline Survey Information

10.3.11 Baseline concentrations of nitrogen dioxide, PM_{10} and $PM_{2.5}$ have been modelled at each of the existing receptor locations (see **Figure 10.1** and **Table 10.1**). The results, which cover both the existing (2018) and future year (2024) baseline (Without Scheme), are set out in **Tables 10.4** and **10.5**. The predictions for nitrogen dioxide include a sensitivity test which accounts for the potential under-performance of emissions control technology on future diesel cars and vans. In addition, the modelled road components of nitrogen oxides, PM_{10} and $PM_{2.5}$ have been increased from those predicted by the model based on a comparison with measurements (see **Appendix 10.2** for details of the model adjustment).

[32] Cheltenham Borough Council 2018 Targeted Feasibility Study to Deliver Nitrogen Dioxide Concentration Compliance in the Shortest Possible Time

Table 10.4: Modelled Annual Mean Baseline Concentrations of Nitrogen Dioxide (µg/m^3) at Existing Receptors

Receptor	2018	2024 Without Scheme	
		'Official' Prediction [a]	Sensitivity Test [b]
R1	36.4	25.7	28.6
R2	32.9	23.3	25.5
R3	30.5	21.8	23.7
R4	**44.6**	31.2	35.2
R5	**44.9**	31.3	35.4
R6	28.9	21.0	22.8
R7	24.6	18.2	19.2
R8	23.4	17.6	18.5
R9	24.7	18.5	19.6
R10	22.1	16.3	16.8
R11	32.1	22.6	24.8
R12	25.0	17.9	19.0
R13	**45.5**	31.4	35.4
R14	33.5	23.4	25.7
R15	34.3	23.9	26.3
R16	38.5	26.7	29.8
R17	26.7	19.0	20.3
R18	26.7	19.0	20.2
R19	28.5	20.1	21.6
R20	12.6	9.8	9.1
R21	17.1	12.8	12.9
R22	19.7	14.7	15.0
R23	26.1	18.8	20.2
R24	23.0	16.9	17.7
R25	23.7	17.3	18.2
R26	**47.5**	32.0	36.0
R27	39.4	27.1	30.1
R28	30.8	21.6	23.2
R29	35.7	24.0	26.2
R30	38.1	26.1	28.9
Objective	**40**		

[a] In line with Defra's forecasts.
[b] Assuming higher emissions from future diesel cars and vans, using CURED v3A[7].

Table 10.5: Modelled Annual Mean Baseline Concentrations of PM_{10} and $PM_{2.5}$ at Existing Receptors (µg/m³)

Receptor	PM_{10} [a]		$PM_{2.5}$	
	2018	2024 Without Scheme	2018	2024 Without Scheme
R1	18.1	17.2	12.3	11.5
R2	17.0	16.1	11.6	10.9
R3	16.6	15.7	11.4	10.7
R4	19.0	18.1	12.9	12.0
R5	19.0	18.1	12.9	12.0
R6	16.8	16.0	11.5	10.8
R7	16.0	15.2	11.0	10.3
R8	15.8	15.0	10.9	10.2
R9	16.1	15.3	11.1	10.4
R10	14.9	14.1	10.3	9.6
R11	16.1	15.2	11.0	10.2
R12	15.0	14.2	10.4	9.6
R13	18.4	17.4	12.4	11.5
R14	16.4	15.5	11.2	10.4
R15	16.5	15.6	11.3	10.4
R16	17.2	16.2	11.7	10.8
R17	15.3	14.4	10.5	9.8
R18	15.3	14.4	10.5	9.8
R19	15.6	14.7	10.7	9.9
R20	13.0	12.2	8.8	8.2
R21	13.8	13.0	9.3	8.6
R22	13.9	13.1	9.5	8.8
R23	14.8	14.0	10.1	9.3
R24	14.4	13.6	9.8	9.1
R25	14.5	13.7	9.9	9.1
R26	18.3	17.2	12.3	11.3
R27	17.0	16.1	11.5	10.6
R28	15.7	14.8	10.7	9.9
R29	16.3	15.3	11.1	10.2
R30	16.8	15.8	11.4	10.5
Objective/Criterion	**32 [a]**		**25 [b]**	

[a] While the annual mean PM_{10} objective is 40 µg/m³, 32 µg/m³ is the annual mean concentration above which an exceedance of the 24-hour mean PM_{10} concentration is possible, as outlined in LAQM.TG16[23]. A value of

32 µg/m^3 is thus used as a proxy to determine the likelihood of exceedance of the 24-hour mean PM_{10} objective, as recommended in EPUK & IAQM guidance[8].

[b] The $PM_{2.5}$ objective, which is to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

10.3.12 The predicted annual mean concentrations of nitrogen dioxide are below the annual mean objective at all but four receptors in 2018, and below the objective at all receptor locations in 2024. The results from the sensitivity test are not materially different from those derived using the 'official' predictions.

10.3.13 The predicted annual mean concentrations of PM_{10} and $PM_{2.5}$ are well below the respective objectives in 2018 and 2024 (for both emission scenarios for nitrogen dioxide) at all receptors. The annual mean PM_{10} concentrations are below 32 µg/m^3 and therefore it is unlikely that the 24-hour mean PM_{10} objective will be exceeded.

10.3.14 These results are consistent with the conclusions of CBC in the outcome of its air quality review and assessment work.

10.4 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

Construction

10.4.1 The construction works will generate HGV movements, but these will be temporary and thus will not have a significant lasting effect on local air quality. The precise volume of HGV movements is not known, however, based on the anticipated build out rate (of 50 properties for year) it is considered unlikely that a significant number of movements would be generated. It is, therefore, judged that the impact of traffic emissions during the construction phase will be 'not significant'.

10.4.2 The construction works will give rise to a risk of dust impacts during demolition, earthworks and construction, as well as from trackout of dust and dirt by vehicles onto the public highway. Step 1 of the assessment procedure is to screen the need for a detailed assessment. There are receptors within the distances set out in the guidance (see **Appendix 10.1**), thus a detailed assessment is required. The following section sets out Step 2 of the assessment procedure.

Potential Dust Emission Magnitude

10.4.3 To provide a worst-case assessment, the Proposed Development is treated as a single phase, whereas in reality, the development will be built out over a number of years.

Demolition

10.4.4 There will be a requirement to demolish a small number of buildings, with a total volume of less than 5,000 m^3. A mobile crusher may be used on site before removal of the material; such crushing plant may require a valid Environmental Permitting Regulations permit. Based on the example definitions set out in **Table 10.1.1** in **Appendix 10.1**, the dust emission class for demolition occurring in Phase 1 is considered to be *small.*

Earthworks

10.4.5 The characteristics of the soil at the development site have been defined using the British Geological Survey's UK Soil Observatory website[33], as set out in **Table 10.6**. Overall, it is considered that, when dry, this soil has the potential to be moderately dusty.

[33] British Geological Survey 2019 UK Soil Observatory Map Viewer, http://mapapps2.bgs.ac.uk/ukso/home.html

Table 10.6: Summary of Soil Characteristics

Category	Record
Soil layer thickness	Deep
Soil Parent Material Grain Size	Argillaceous [a]
European Soil Bureau Description	Claystone / Mudstone
Soil Texture	Clay to Clayey Loam [b]

[a] grain size < 0.06 mm.

[b] a loam is composed mostly of sand and silt.

10.4.6 The total site covers approximately 150,000 m^2 and at least two-thirds of this will be subject to earthworks. Earthworks will involve the excavation and landscaping of the site. Dust from the earthworks will arise mainly from the excavation of soil, vehicles travelling over unpaved ground, tipping of soil, stockpiling soil and from the handling of dusty materials (such as dry soil). Based on the example definitions set out in **Table A10.1.1** in **Appendix 10.1**, the dust emission class for earthworks in each phase is considered to be *large*.

Construction

10.4.7 The Proposed Development will involve the construction of up to 250 residential dwellings, and associated infrastructure. The combined total building volume is estimated to be approximately 150,000 m^3. Dust will arise from vehicles travelling over unpaved ground, the handling and storage of dusty materials, onsite concrete batching and from the cutting of concrete. Based on the example definitions set out in **Table A10.1.1** in **Appendix 10.1**, the dust emission class for construction is considered to be *large*.

Trackout

10.4.8 The number of vehicles accessing the site, which may track out dust and dirt is currently unknown, however, taking account of the build out rate, it is estimated there will be a maximum of between 10-50 heavy vehicle movements per day. Based on the example definitions set out in **Table A10.1.1** in **Appendix 10.1**, the dust emission class for trackout is considered to be *medium*.

10.4.9 **Table 10.7** summarises the dust emission magnitude for each phase of the Proposed Development.

Table 10.7: Summary of Dust Emission Magnitude

Source	Dust Emission Magnitude
Demolition	Small
Earthworks	Large
Construction	Large
Trackout	Medium

N/A = not applicable.

Sensitivity of the Area

10.4.10 This assessment step combines the sensitivity of individual receptors to dust effects with the number of receptors in the area and their proximity to the Application Site. It also considers additional site-specific factors such as topography and

screening, and in the case of sensitivity to human health effects, baseline PM_{10} concentrations.

Sensitivity of the Area to Effects from Dust Soiling

10.4.11 The IAQM guidance explains that residential properties are 'high' sensitivity receptors to dust soiling, places of work are 'medium' sensitivity receptors to dust soiling, and short term car parks are 'low' sensitivity receptors to dust soiling (**Table A10.1.2** in **Appendix 10.1**). There are between 10 and 100 residential properties within 20 m of the Application Site boundary (see **Figure 10.3**). Using the matrix set out in **Table A10.1.3** in **Appendix 10.1**, the area is of 'high' sensitivity to dust soiling.

10.4.12 **Table 10.7** shows that the dust emission magnitude for trackout is *medium* and **Table A10.1.2** in **Appendix 10.1** thus explains that there is a risk of material being tracked 200 m from the site exit. Since it is not known which roads construction vehicles will use, it has been assumed that all possible routes could be affected.

10.4.13 There are more than 10 residential properties within 20 m of the roads along which material could be tracked (see **Figure 10.4**). Based on the criteria set out in **Table A10.1.1** in **Appendix 10.1**, the area is of 'high' sensitivity to dust soiling due to trackout.

Sensitivity of the Area to any Human Health Effects

10.4.14 Residential properties are also classified as being of 'high' sensitivity to human health effects. The matrix in **Table A10.1.4** in **Appendix 10.1** requires information on the baseline annual mean PM_{10} concentration in the area. The maximum predicted baseline PM_{10} concentration at any of the receptors is 19.0 $\mu g/m^3$ (**Table 10.3**), and this value has been used. Using the matrix in **Table A10.1.4** in **Appendix 10.1**, for all phases of the development, the areas surrounding the onsite works and surrounding roads along which material may be tracked from the site are of 'low' sensitivity to human health effects.

Sensitivity of the Area to any Ecological Effects

10.4.15 The guidance only considers designated ecological sites within 50 m to have the potential to be impacted by the construction works. There are no designated ecological sites within 50 m of the site boundary or those roads along which material may be tracked, thus ecological impacts will not be considered further.

Summary of Area Sensitivity

10.4.16 **Table 10.8** summarises the sensitivity of the area around the Application Site.

Table 10.8: Summary of the Area Sensitivity

Effects Associated With:	Sensitivity of the Surrounding Area	
	On-site Works	**Trackout**
Dust Soiling	High	High
Human Health	Low	Low

Risk and Significance

10.4.17 The dust emission magnitudes in **Table 10.7** have been combined with the sensitivities of the area in **Table 10.8** using the matrix in **Table A10.1.6** in **Appendix 10.1**, in order to assign a risk category to each activity. The resulting risk

categories for the four construction activities, without mitigation, are set out in **Table 10.9**. These risk categories have been used to determine the appropriate level of mitigation as set out in **Appendix 10.5**.

Table 10.9: Summary of Risk of Impacts Without Mitigation

Source	Dust Soiling	Human Health
Demolition	Medium Risk	Negligible
Earthworks	High Risk	Low Risk
Construction	High Risk	Low Risk
Trackout	Medium Risk	Low Risk

10.4.18 The IAQM does not provide a method for assessing the significance of effects before mitigation, and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant'[6].

Operation

Road Traffic Impacts

10.4.19 Predicted annual mean concentrations of nitrogen dioxide, PM_{10} and $PM_{2.5}$ in 2020 are set out in **Tables 10.10** to **10.12** for both the "Without Scheme" and "With Scheme" scenarios. These tables also describe the impacts at each receptor using the impact descriptors given in **Appendix A10.3**. For nitrogen dioxide, results are presented for two scenarios so as to include a worst-case sensitivity test.

Table 10.10: Predicted Impacts on Annual Mean Nitrogen Dioxide Concentrations in 2024 (µg/m^3)

Receptor	Without Scheme [a]	With Scheme [a]	% Change [a,b]	Impact Descriptor [a]	Worst-case Sensitivity Test [c]			
					Without Scheme	With Scheme	% Change [c]	Impact Descriptor
R1	25.7	25.8	0	Negligible	28.6	28.7	0	Negligible
R2	23.3	23.4	0	Negligible	25.5	25.7	0	Negligible
R3	21.8	21.9	0	Negligible	23.7	23.8	0	Negligible
R4	31.2	31.4	1	Negligible	35.2	35.5	1	Negligible
R5	31.3	31.7	1	Negligible	35.4	35.8	1	Negligible
R6	21.0	21.1	0	Negligible	22.8	22.9	0	Negligible
R7	18.2	18.2	0	Negligible	19.2	19.3	0	Negligible
R8	17.6	17.7	0	Negligible	18.5	18.6	0	Negligible
R9	18.5	18.7	0	Negligible	19.6	19.8	0	Negligible
R10	16.3	16.4	0	Negligible	16.8	17.0	0	Negligible
R11	22.6	22.8	1	Negligible	24.8	25.1	1	Negligible
R12	17.9	18.1	0	Negligible	19.0	19.1	0	Negligible
R13	31.4	32.1	2	Slight Adverse	35.4	36.3	2	Slight Adverse
R14	23.4	24.7	3	Negligible	25.7	27.3	4	Negligible
R15	23.9	24.3	1	Negligible	26.3	26.8	1	Negligible
R16	26.7	27.1	1	Negligible	29.8	30.3	1	Negligible
R17	19.0	19.3	1	Negligible	20.3	20.6	1	Negligible
R18	19.0	19.4	1	Negligible	20.2	20.8	1	Negligible
R19	20.1	20.4	1	Negligible	21.6	22.0	1	Negligible
R20	9.8	10.1	1	Negligible	9.1	9.5	1	Negligible
R21	12.8	13.0	1	Negligible	12.9	13.2	1	Negligible
R22	14.7	14.8	0	Negligible	15.0	15.1	0	Negligible
R23	18.8	19.0	0	Negligible	20.2	20.4	0	Negligible
R24	16.9	16.9	0	Negligible	17.7	17.8	0	Negligible
R25	17.3	17.4	0	Negligible	18.2	18.3	0	Negligible
R26	32.0	32.5	1	Negligible	36.0	36.5	1	Negligible
R27	27.1	27.5	1	Negligible	30.1	30.5	1	Negligible
R28	21.6	21.8	1	Negligible	23.2	23.6	1	Negligible
R29	24.0	24.2	0	Negligible	26.2	26.4	1	Negligible

R30	26.1	26.6	1	Negligible	28.9	29.4	1	Negligible
Objective	**40**		**-**	**-**	**40**		**-**	**-**

[a] In line with Defra's forecasts.
[b] % changes are relative to the objective and have been rounded to the nearest whole number.
[c] Assuming higher emissions from future diesel cars and vans, using CURED v3A[7].

Table 10.11: Predicted Impacts on Annual Mean PM_{10} Concentrations in 2024 ($\mu g/m^3$)

Receptor	Without Scheme	With Scheme	% Change [a]	Impact Descriptor
R1	17.2	17.3	0	Negligible
R2	16.1	16.1	0	Negligible
R3	15.7	15.7	0	Negligible
R4	18.1	18.2	0	Negligible
R5	18.1	18.2	0	Negligible
R6	16.0	16.0	0	Negligible
R7	15.2	15.2	0	Negligible
R8	15.0	15.0	0	Negligible
R9	15.3	15.4	0	Negligible
R10	14.1	14.1	0	Negligible
R11	15.2	15.2	0	Negligible
R12	14.2	14.2	0	Negligible
R13	17.4	17.6	1	Negligible
R14	15.5	15.8	1	Negligible
R15	15.6	15.7	0	Negligible
R16	16.2	16.3	0	Negligible
R17	14.4	14.5	0	Negligible
R18	14.4	14.5	0	Negligible
R19	14.7	14.7	0	Negligible
R20	12.2	12.3	0	Negligible
R21	13.0	13.0	0	Negligible
R22	13.1	13.1	0	Negligible
R23	14.0	14.0	0	Negligible
R24	13.6	13.6	0	Negligible
R25	13.7	13.7	0	Negligible
R26	17.2	17.3	0	Negligible
R27	16.1	16.1	0	Negligible
R28	14.8	14.9	0	Negligible
R29	15.3	15.4	0	Negligible

R30	15.8	15.9	0	Negligible
Criterion	**32 [b]**		**-**	**-**

[a] % changes are relative to the criterion and have been rounded to the nearest whole number.
[b] While the annual mean PM_{10} objective is 40 µg/m^3, 32 µg/m^3 is the annual mean concentration above which an exceedance of the 24-hour mean PM_{10} concentration is possible, as outlined in LAQM.TG16[23]. A value of 32 µg/m^3 is thus used as a proxy to determine the likelihood of exceedance of the 24-hour mean PM_{10} objective, as recommended in EPUK & IAQM guidance[8].

Table 10.12: Predicted Impacts on Annual Mean $PM_{2.5}$ Concentrations in 2024 (µg/m^3)

Receptor	Without Scheme	With Scheme	% Change [a]	Impact Descriptor
R1	11.5	11.5	0	Negligible
R2	10.9	10.9	0	Negligible
R3	10.7	10.7	0	Negligible
R4	12.0	12.0	0	Negligible
R5	12.0	12.1	0	Negligible
R6	10.8	10.8	0	Negligible
R7	10.3	10.4	0	Negligible
R8	10.2	10.3	0	Negligible
R9	10.4	10.4	0	Negligible
R10	9.6	9.6	0	Negligible
R11	10.2	10.2	0	Negligible
R12	9.6	9.7	0	Negligible
R13	11.5	11.6	0	Negligible
R14	10.4	10.6	1	Negligible
R15	10.4	10.5	0	Negligible
R16	10.8	10.9	0	Negligible
R17	9.8	9.8	0	Negligible
R18	9.8	9.8	0	Negligible
R19	9.9	10.0	0	Negligible
R20	8.2	8.2	0	Negligible
R21	8.6	8.6	0	Negligible
R22	8.8	8.8	0	Negligible
R23	9.3	9.3	0	Negligible
R24	9.1	9.1	0	Negligible
R25	9.1	9.1	0	Negligible
R26	11.3	11.3	0	Negligible
R27	10.6	10.7	0	Negligible
R28	9.9	9.9	0	Negligible

R29	10.2	10.2	0	Negligible
R30	10.5	10.5	0	Negligible
Objective	**25** [b]		**-**	**-**

[a] % changes are relative to the criterion and have been rounded to the nearest whole number.
[b] The $PM_{2.5}$ objective, which is to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

Nitrogen Dioxide

10.4.20 The predicted annual mean nitrogen dioxide concentrations are below the objective at all receptors, in both emissions scenarios, with or without the scheme. The percentage changes in concentrations, relative to the air quality objective (when rounded), are predicted to range from zero to 4% (at one receptor in the sensitivity test). Using the matrix in **Table A10.3.1** in **Appendix 10.3**, predicted impacts are described as negligible at 29 of the receptors, and slight adverse at one receptor.

PM_{10} and $PM_{2.5}$

10.4.21 The predicted annual mean PM_{10} and $PM_{2.5}$ concentrations are well below the annual mean objectives at all receptors, with or without the scheme. Furthermore, as the annual mean PM_{10} concentrations are below 32 µg/m^3, it is unlikely that the 24-hour mean PM_{10} objective will be exceeded at any of the receptors.

10.4.22 The percentage changes in both PM_{10} and $PM_{2.5}$ concentrations, relative to the air quality objective (when rounded), are predicted to range from zero to 1%. Using the matrix in **Table A10.3.1** in **Appendix 10.3**, these impacts are described as negligible.

Impacts on the Development

10.4.23 Predicted air quality conditions for future residents of the Proposed Development are set out in **Table 10.13** (see **Figure 10.1** for receptor locations). All of the values are well below the objectives at locations adjacent to Harp Hill. The area adjacent to Harp Hill will be made up of green infrastructure, and residential properties will be set back from Harp Hill by at least 70 m, the predictions are therefore very worst-case. Air quality for future residents within the development will thus be acceptable, and the effects are therefore considered to be *insignificant.*

Table 10.13: Predicted Concentrations of Nitrogen Dioxide (NO_2), PM_{10} and $PM_{2.5}$ in 2024 for New Receptors in the Development Site (µg/m^3)

Receptor	Annual Mean NO_2 (µg/m^3)		Annual Mean PM_{10} (µg/m^3)	Annual Mean $PM_{2.5}$ (µg/m^3)
	'Official' Prediction [a]	Sensitivity Test [b]		
RA	15.1	15.4	13.8	9.4
RB	12.6	12.7	13.0	8.6
RC	12.5	12.6	12.9	8.6
RD	12.3	12.3	12.9	8.5
Criterion	**40**		**32** [c]	**25** [d]

[a] In line with Defra's forecasts.
[b] Assuming higher emissions from future diesel cars and vans, using CURED v3A[7].
[c] While the annual mean PM_{10} objective is 40 µg/m^3, 32 µg/m^3 is the annual mean concentration above which an exceedance of the 24-hour mean PM_{10} concentration is possible, as outlined in LAQM.TG16[23]. A value of

32 µg/m^3 is thus used as a proxy to determine the likelihood of exceedance of the 24-hour mean PM_{10} objective, as recommended in EPUK & IAQM guidance[8].

[d] The $PM_{2.5}$ objective, which is to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

Significance of Operational Air Quality Effects

10.4.24 The operational air quality effects without mitigation are judged to be 'not significant'. This professional judgement is made in accordance with the methodology set out in **Appendix 10.3**, and also takes into account the results of the sensitivity test for nitrogen dioxide. Future year concentrations are expected to lie between the two sets of results, but in order to provide a reasonable worst-case assessment, the judgement of significance focuses primarily on the results from the sensitivity test.

10.4.25 More specifically, the judgement that the air quality effects will be 'not significant' without mitigation takes account of the assessment that:

- pollutant concentrations at locations within the proposed development are expected to be below the objectives, thus future residents will experience acceptable air quality; and
- pollutant concentrations at all of the selected worst-case existing receptors along the local road network will be below the air quality objectives with or without the Proposed Development in place, and the impacts are predicted to be negligible at all but one receptor, where the impact is predicted to be slight adverse.

Decommissioning

10.4.26 Given the nature and intended longevity of the Proposed Development's operational life, decommissioning has not been considered relevant as part of this study. Accordingly, the EIA is to focus on the potential likely significant effects of the Proposed Development during construction and operational phases only.

10.5 MITIGATION AND ENHANCEMENT

Mitigation by Design

10.5.1 The EPUK/IAQM guidance advises that good design and best practice measures should be considered, whether or not more specific mitigation is required. The Proposed Development incorporates the following good design and best practice measures:

- adoption of a Dust Management Plan (DMP) to minimise the environmental impacts of the construction works;
- setting back of the proposed properties from roads by at least 70 m;
- provision of a Travel Information Pack to all new residents of the development setting out information on walking and cycling routes, local cycle hire schemes, bus and rail timetables, car sharing schemes, along with details of how to claim a £75 Green Travel Voucher to be used for the purchase of a monthly bus ticket or towards the purchase of a bicycle or cycle safety equipment; and
- provision of pedestrian and cycle access to the Proposed Development, including secure cycle parking for each dwelling.

Additional Mitigation

Construction Impacts

10.5.2 Measures to mitigate dust emissions will be required during the construction phase of the development in order to reduce impacts upon nearby sensitive receptors.

10.5.3 The site has been identified as a Medium Risk site during demolition and trackout, and a High Risk site during earthworks and construction, as set out in **Table 10.9**. Comprehensive guidance has been published by IAQM[6] that describes measures that should be employed, as appropriate, to reduce the impacts, along with guidance on monitoring during demolition and construction[34]. This reflects best practice experience and has been used, together with the professional experience of the consultant and the findings of the dust impact assessment, to draw up a set of measures that should be incorporated into the specification for the works. These measures are described in **Appendix 10.5**.

10.5.4 The mitigation measures should be written into a dust management plan (DMP). The DMP may be integrated into a Code of Construction Practice or the Construction Environmental Management Plan, and may require monitoring.

10.5.5 Where mitigation measures rely on water, it is expected that only sufficient water will be applied to damp down the material. There should not be any excess to potentially contaminate local watercourses.

Road Traffic Impacts

10.5.6 The assessment has demonstrated that the Proposed Development will not cause any exceedances of the air quality objectives, and that the overall effect of the Proposed Development will be 'not significant'. It is, therefore, not considered appropriate to propose further mitigation measures for this scheme.

10.5.7 Measures to reduce pollutant emissions from road traffic are principally being delivered in the longer term by the introduction of more stringent emissions standards, largely via European legislation (which is written into UK law). The Council's Air Quality Action Plan will also be helping to deliver improved air quality.

Table 10.14: Mitigation

Ref	Measure to avoid, reduce or manage any adverse effects and/or to deliver beneficial effects	How measure would be secured		
		By Design	By S.106	By Condition
1	Package of mitigation measures to minimise emissions during the construction phase			X

10.6 CUMULATIVE AND IN-COMBINATION EFFECTS

Construction

10.6.1 The IAQM guidance is clear that, with appropriate mitigation measures in place, any residual construction dust effects from an individual site will be 'not significant'. The guidance also suggests that cumulative construction dust impacts are only likely where sites are within 500 m of each other. Work would also have to be taking place in areas of both sites that are close to a receptor in order for cumulative effects to occur.

10.6.2 In accordance with the mitigation measures set out in **Appendix 10.5**, the construction contractors should "**hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised**".

10.6.3 Of the identified cumulative schemes, only the GCHQ site lies within 500 m of the Application Site boundary. The site is substantially built out and it is likely that

[34] IAQM 2018 Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites, www.iaqm.co.uk/guidance.html

construction will be completed prior to commencement of construction activities on the Application Site.

Operation

10.6.4 The effects of traffic emissions generated by the identified cumulative schemes have been accounted for by including vehicle movements associated with these developments in the 2024 flows used in the assessment. As such, predictions of future pollutant concentrations presented in this chapter take account of cumulative effects. The significance of cumulative air quality effects is the same as identified in the Section 10.4.

10.6.5 In the event that one or more of the identified cumulative schemes considered in the transport assessment does not materialise, then the future baseline traffic flows would be lower than those used in the assessment. This would not adversely affect the conclusions of this assessment, and the assessment is thus judged to be robust.

10.7 SUMMARY

Introduction

10.7.1 The air quality impacts associated with the Proposed Development have been assessed. Consideration was given to the potential air quality impacts associated with demolition of the existing buildings and subsequent construction of the Proposed Development, and impacts that operation of the Proposed Development would have on local air quality. Operational impacts that were considered included road traffic generated by the Proposed Development.

Baseline Conditions

10.7.2 Baseline air quality conditions in the study area were determined based on the local authority's monitoring data and other publicly available data. The Application Site lies within the borough-wide AQMA declared by CBC for exceedances of the annual mean nitrogen dioxide objective. Monitoring undertaken by the Council shows that concentrations of nitrogen dioxide within the study area have been below the objective in recent years.

Likely Significant Effects

10.7.3 Construction activities were shown to be associated with a High risk of dust impacts, without mitigation. With the proposed mitigation measures in place, residual effects will be 'not significant'.

10.7.4 The assessment showed that the effect of additional road traffic emissions on air quality at existing residential properties is 'not significant'; air quality for future residents of the Proposed Development was also shown to be acceptable.

Mitigation and Enhancement

10.7.5 A package of measures has been identified based on the level of risk of adverse effects during the construction phase; these will be implemented at the Application Site during construction to minimise emissions.

10.7.6 The assessment has demonstrated that the overall effect of additional road traffic emissions generated by the Proposed Development will be 'not significant'. Specific mitigation measures are not therefore required. The Proposed Development will, however, include a number of design features and enhancements to encourage future

residents to make sustainable and lower emission travel choices, and these will provide further benefits for local air quality.

Conclusion

10.7.7 Overall, the effects of the Proposed Development on local air quality have been found to be 'not significant'.

10.7.8 **Table 5.15** provides a summary of effects, mitigation and residual effects.

Table 10.15: Summary of Effects, Mitigation and Residual Effects

Receptor/ Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation/ Enhancement Measures	Residual Effects ****
Construction								
Residential, Commercial	Dust and elevated PM_{10}	Temporary Direct	Low to High	Small to Large Adverse	Local	Negligible to High Risk	Package of mitigation measures to minimise dust emissions.	Not significant
Operation								
Residential, Existing and Proposed	Nitrogen dioxide, PM_{10} and $PM_{2.5}$	Permanent Direct	High	Negligible	Local	Negligible	No specific mitigation. Scheme includes enhancements such as Travel Plan and good practice measures which go towards improving local air quality.	Not significant
Cumulative and In-combination								
Residential, Commercial	Dust and elevated PM_{10}	Temporary Direct	Low to High	Small to Large Adverse	Local	Negligible to High Risk	Package of mitigation measures to minimise dust emissions.	Not significant
Residential, Existing and Proposed	Nitrogen dioxide, PM_{10} and $PM_{2.5}$	Permanent Direct	High	Negligible	Local	Negligible	No specific mitigation.	Not significant

11 NOISE AND VIBRATION

11.1 INTRODUCTION

11.1.1 This chapter assesses the likely significant effects of the Proposed Development with respect to noise and vibration. In particular, it considers the potential effects of noise from surrounding land uses on the occupants of the Proposed Dwellings and the potential effects during construction and operation of the Proposed Development on surrounding noise-sensitive receptors.

11.1.2 The chapter describes the methods used to assess the effects and determines the baseline conditions currently existing at the Application Site. The potentially affected noise and vibration sensitive receptors surrounding the Application Site are identified, together with the potential direct and indirect effects arising from the Proposed Development. Mitigation measures are identified in outline, where required, to prevent, reduce or offset the effects and the residual effects are also described.

11.1.3 This assessment comprises the following elements:

- Identification of sensitive receptors;
- Establishment of baseline conditions;
- Establishment of design aims for new buildings;
- Outline assessment of noise and vibration generated during the construction phase;
- Assessment of noise levels in the operational phase of the Proposed Development (with principal reference to the NPPF (National Planning Policy Framework), BS 8233 and World Health Organisation guidelines); and
- Where appropriate, indicative proposals for mitigation.

11.1.4 This approach is standard practice for conducting an assessment of noise relating to this type of development.

11.1.5 Data relating to the Noise and Vibration Assessment is contained within **Appendix 11.1**.

11.2 ASSESSMENT APPROACH

Methodology and Assessment of Significance

11.2.1 A description of the noise and vibration units referred to is provided in **Appendix 11.1**.

Principal Standards and Guidance

Construction

11.2.2 BS 5228 Parts 1 and 2 [Ref 11.1, 11.2] provides guidance for assessing noise and vibration during the construction of the development. The standard describes procedures for estimating noise and vibration levels from construction activities. It also provides guidance on minimising potential impacts through the use of mitigation and the adoption of Best Practicable Means (BPM) or Best Available Techniques Not Entailing Excessive Cost (BATNEEC).

11.2.3 BPM or BATNEEC both seek to ensure that the contractors adopt best practice measures to reduce noise and vibration from site activities. The use of BPM to control

emissions constitutes a ground of defence against charges that a nuisance is being caused under Part III of the Environmental Protection Act.

11.2.4 Whilst BS 5228 does not provide specific guidance with regards acceptable noise levels associated with construction activities, it provides guidance on limits adopted for a number of previous schemes, which were considered to provide satisfactory levels of noise for construction projects.

11.2.5 Based on this guidance, it is often appropriate to set noise Action Levels to provide an indication of the noise levels that can be generated from construction activities, which should minimise the potential for adverse effects. A level of 10 dB(A) above the existing ambient (L_{Aeq}) noise level is often specified, subject to a minimum level of 70 dB $L_{Aeq,T}$ for rural areas and 75 dB $L_{Aeq,T}$ within urban areas. By adopting noise limits of this order of magnitude, contractors are generally seen to be adopting best practice to reducing construction noise levels to an acceptable standard.

11.2.6 With regards acceptable levels of vibration, BS 5228 advises that at a Peak Particle Velocity (PPV) level of 0.3 mm/s vibration might just be perceptible within residential environments, with levels of 1.0 mm/s having the potential to cause complaint but can be tolerated if prior warning is given to residents. At levels of 10 mm/s, the activity would be intolerable for any more than a brief exposure.

11.2.7 BS 7385 [Ref 11.3] defines criteria for two different types of building structure, brick-built residential and more heavily-built industrial. The standard advises that there is a minimal risk of cosmetic damage (i.e. the formation of hairline cracks on drywalls, plaster or in mortar joints) at the specific guidance levels.

11.2.8 For residential buildings the limit for cosmetic damage varies with frequency and a conservative level of 12.5 mm/s PPV, as defined in BS 7385, has been adopted.

Operation of the Completed Development

British Standard BS 8233: 2014 – Guidance on Sound Insulation and Noise Reduction for Buildings

11.2.9 BS 8233 [Ref 11.4] is a Code of Practice providing guidelines for the control of noise within various types of buildings. The document recommends acceptable noise levels for the overall acoustic environment within residential properties. For residential properties, the guidance recommends the following design aims for the daytime (07:00 – 23:00) and night-time (23:00 – 07:00) periods:

- 35 dB $L_{Aeq,T}$ within living rooms and bedrooms during the daytime period;
- 40 dB $L_{Aeq,T}$ within dining areas / rooms during the daytime period;
- 30 dB $L_{Aeq,T}$ within bedrooms at night; and
- 50 – 55 dB $L_{Aeq,T}$ within gardens and open spaces.

11.2.10 Where the above limits require windows to be closed to maintain the standard of noise, there needs to be appropriate alternative ventilation provided that does not compromise the façade insulation or resulting noise level.

11.2.11 With regards to outdoor spaces, it is recognised that these guideline values may not be achievable in all circumstances, such as locations adjacent to main road networks. In these areas a compromise between elevated noise level and location, should be made, ensuring that the design seeks to achieve the lowest practicable levels in external spaces, but should not be prohibited.

World Health Organisation (WHO) – Guidelines for Community Noise

11.2.12 The WHO document [Ref 11.5] provides guidance of a similar nature to BS 8233, although the emphasis is more on health effects associated with noise. The document recommends internal and external noise levels to provide an acoustic environment conducive to un-interrupted speech and sleep, equivalent to those specified within BS 8233.

Road Traffic

11.2.13 Changes in road traffic noise levels have been considered against the guidance presented in DMRB [Ref 11.6]. Whilst not strictly appropriate in this case, as no new roads are proposed outside of the Proposed Development, the guidance provides a methodology to assess potential noise impacts associated with road traffic.

11.2.14 The guidance proposes the following assessment criteria, which have been adopted for the purposes of this assessment to assess potential effects associated with changes in road traffic flows on surrounding roads as a result of the Proposed Development and other committed developments in the surrounding area.

Table 11.1: Classification of Magnitude of Road Traffic Noise Impacts

Noise Change $L_{Aeq, 16\ Hour}$	**Magnitude of Impact**
Decrease of More than 10	Major Beneficial
Decrease of 5 – 9.9	Moderate Beneficial
Decrease of 3 – 4.9	Minor Beneficial
Decrease of 0.1 – 2.9	Negligible Beneficial (not significant)
0	No Change (not significant)
Increase of 0.1 – 2.9	Negligible Adverse (not significant)
Increase of 3 – 4.9	Minor Adverse
Increase of 5 – 9.9	Moderate Adverse
Increase of More than 10	Major Adverse

11.2.15 Adverse effects have been identified when changes in noise levels of more than dB(A) have been identified, i.e. at an impact threshold of minor and above. A 3dB(A) change in noise levels is considered to be the lowest change detectable under normal listening conditions

11.2.16 Significant effects have been identified when changes in noise levels of more than 5 dB(A) have been identified, i.e. at an impact threshold of minor and above. A 3dB(A) change in noise levels is considered to be the lowest change detectable under normal listening conditions.

Policy Framework

National Planning Policy Framework

11.2.17 The National Planning Policy Framework (NPPF) provides the principal planning guidance and in relation to noise, advises that planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life from new development;
- Mitigate and reduce to a minimum, potential adverse impacts resulting from noise from new development;
- Ensure that new development can be effectively integrated with existing businesses and community facilities; and
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

11.2.18 The accompanying planning policy guidance to the NPPF, published in July 2019, provides a description of a significant adverse impact, as follows:

> **"The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area."**

Local Planning Policy and Guidance

11.2.19 Saved Policies CP3 and CP4 of the Cheltenham Borough Local Plan, Adopted July 2006 relate to noise and are summarised below.

> **Policy CP3: Sustainable Environment**
>
> **Development will be permitted where it would:…**
>
> **(e) not give rise to harmful level of pollution (including noise) to land, air or water (Surface or ground)…**
>
> **Policy CP4: Safe and Sustainable Living**
>
> **Development will be permitted where it would:**
>
> **(a) not cause unacceptable harm to the amenity of adjoining land users and the locality;**
>
> **Not result in level of traffic to and from the site attaining an environmentally unacceptable level…**

11.2.20 Policies SD14 and INF1 of the Gloucester Cheltenham and Tewkesbury Joint Core Strategy 2011 – 2031 also relate to noise and have been considered within the assessment.

Policy SD14: Health and Environmental Quality

1. High-quality development should protect and seek to improve environmental quality. Development should not create or exacerbate conditions that could impact on human health or cause health inequality.

2. New development must:

i. Cause no unacceptable harm to local amenity including the amenity of neighbouring occupants;

ii. Result in no unacceptable levels of air, noise, water, light or soil pollution or odour, either alone or cumulatively, with respect to relevant national and EU limit values;

iii. Result in no exposure to unacceptable risk from existing or potential sources of pollution. For example, by avoiding placing sensitive uses in locations where national or EU limit values are exceeded, or by incorporating acceptable mitigation measures into development…

Policy INF1: Transport Network

Developers should provide safe and accessible connections to the transport network to enable travel choice for residents and commuters. All proposals should ensure that:

2. Planning permission will be granted only where the impact of development is not considered to be severe. Where severe impacts that are attributable to the development are considered likely, including as a consequence of cumulative impacts, they must be mitigated to the satisfaction of the Local Planning Authority in consultation with the Highway Authorities and in line with the Local Transport Plan

3. Developers will be required to assess the impact of proposals on the transport network through a Transport Assessment. The assessment will demonstrate the impact, including cumulative impacts, of the prospective development on: …

iii. Noise and / or atmospheric pollution within the zone of influence of the development.

Scoping Criteria

11.2.21 For the new residential areas of the development, it is appropriate to assess the noise environment against the guidance presented within BS 8233 to ascertain areas where additional noise mitigation measures would need to be considered and to identify constraints upon the developable area taking account of traffic changes on the surrounding roads. Where necessary, a detailed assessment would be undertaken at a later stage to determine the specific noise mitigation measures for individual plots and to demonstrate that the requirements of BS 8233 were achieved within proposed dwellings, thus according with the requirements of the NPPF and relevant local plan policies.

Construction Phase

11.2.22 A Construction Environmental Management Plan (CEMP) will be adopted to minimise potential disturbance to local residents in the surrounding area during the construction of the Proposed Development.

11.2.23 For construction activities, it is common practice to define a Noise Action Level of 10 dB(A) above the existing ambient L_{Aeq} noise levels (subject to a minimum daytime level of 70 dB $L_{Aeq,T}$ in rural areas) at noise-sensitive properties during the daytime, above which complaints may be expected to be received. Noise levels above this criterion can be considered as a minor adverse impact if the activity is for a short duration (up to a few weeks) or a moderate/high adverse impact if noise levels continue above this limit for a prolonged period.

11.2.24 BS 5228 provides guidance on acceptable levels of vibration associated with construction activities. Based on the information provided within the guidance, a significant adverse impact has been identified where levels of vibration regularly exceed 1 mm/s at vibration sensitive receptors.

Operational Phase

11.2.25 When assessing noise upon new residential developments, impact criteria are generally defined from absolute levels specified in the relevant national or local guidance and it is not normally appropriate to assess potential impacts upon new properties on the basis of a semantic scale of noise change. For the new properties, potential impacts have been assessed against national standards and guidelines, including the NPPF, BS 8233 and WHO guidelines.

11.2.26 Given that the NPPF does not provide specific guidance, the design of the development would seek to ensure noise levels were commensurate with BS 8233 guidelines internally and within gardens. A significant adverse effect would be identified where noise levels were anticipated to be above these limits and in these areas, appropriate noise mitigation measures would be identified to reduce noise levels to an acceptable standard, to achieve the requirements of the NPPF.

11.2.27 The design aims to be adopted within the residential areas of the Proposed Development, which could be imposed as part of a planning condition, are:

- 35 dB $L_{Aeq,T}$ within living rooms and bedrooms during the daytime, with windows closed and alternative means of background ventilation provided;
- 30 dB $L_{Aeq,T}$ within bedrooms at night, with windows closed and alternative means of background ventilation provided; and
- 55 dB $L_{Aeq,T}$ on balconies and within garden areas.

Road Traffic

11.2.28 The assessment of potential effects at existing and future noise-sensitive receptors associated with the changes in road traffic on the local road network has been undertaken on the basis of the assessment criteria presented in **Table 11.1.**

11.3 BASELINE CONDITIONS

Site Description and Context

11.3.1 The application site is remote from any major transportation or industrial noise sources.

11.3.2 The main source of noise identifiable within the Application Site is associated with road traffic travelling along the surrounding road network.

11.3.3 Light aircraft fly over the site periodically during the daytime periods on approach to Gloucester Airport to the west. Aircraft flying overhead are clearly audible and clearly influence the noise environment within the Application Site. The airport is normally operational during the daytime periods between 08:30 – 19:30 Mondays to Fridays and 09:00 – 19:30 at weekends. The airport does not normally operate during the evening or overnight.

11.3.4 The site is surrounded on all four sides by existing residential properties, which would be potentially affected during the demolition and construction phase and consideration to these properties has been given within this assessment. The properties are identified on Figure 1 of **Appendix 11.1**.

Baseline Survey Information

11.3.5 In order to ascertain the existing noise environment on the Application Site and to inform the design of the Proposed Development, a noise monitoring exercise was carried out between 3 to 10 October 2019. The survey principally comprised unattended noise surveys undertaken at two locations, along the north western site boundary and southern development boundary. The unattended surveys were supplemented with attended sample measurements at a further four positions to enable the variation in noise levels around the site and at other noise sensitive properties to be determined.

11.3.6 A more detailed description of the monitoring exercise is provided in **Appendix 11.1**, with the monitoring locations indicated on Figure 1 of **Appendix 11.1**.

11.3.7 The results of the unattended noise surveys are presented fully within **Appendix 11.1**. A summary of the unattended noise surveys are provided graphically on Figures 2 and 3 of **Appendix 11.1.**

11.3.8 The results of the unattended and sample noise monitoring have been evaluated to ascertain the existing day and night-time noise levels within the Application Site, which are presented in **Table 11.2** below.

Table 11.2 Period Noise Levels

Monitoring Location		Period Free-field $L_{Aeq,T}$ Noise Levels [dB]		Principal Noise Sources
		Daytime	Night-time	
U1	North western site boundary	49	37	Distant road traffic, aircraft movements into Gloucester airport during daytime periods.
U2	Southern boundary of residential development	50	40	
S1	North eastern site boundary	47	37	
S2	Eastern site boundary	46	36	
S3	10m from kerb of Harp Hill (southern site boundary)	54	45	
S4	Western site boundary	47	38	

11.4 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

Construction

11.4.1 At this stage of the Proposed Development, the construction programme is necessarily broad, as this will be progressed during detailed design prior to construction commencing, although the construction activities would be typical for a residential lead development.

11.4.2 The main phases of the construction process, identified as giving rise to the greatest potential for adverse effects upon the existing residents of surrounding properties, are as follows:

- Demolition of the remaining farm buildings;
- Initial ground works and installation of infrastructure, power, drainage, etc within the Proposed Development;
- General residential construction activities; and
- Vehicle movements.

11.4.3 It is anticipated that construction of the Proposed Development would commence in 2020, with the demolition, ground works to install drainage, power, etc and to construct the new access road from Harp Hill.

11.4.4 During this stage, it is likely that the largest amount of construction plant would be required on site, which would include, excavators, articulated dump trucks, road construction plant and HGV movements. Typical noise levels associated with this type of plant would be of the order of 75 – 80 dB L_{Aeq} at a distance of 10 metres.

11.4.5 Based upon this source noise level, calculations have been made to assess at what distance a 70 dB L_{Aeq} adverse effect threshold would be exceeded, which would result in a minor adverse effect. The assessment indicates that the limit may be

exceeded when works are within a distance of up to 50 metres of existing noise sensitive properties adjacent to the site boundaries.

11.4.6 These works would result in a minor to moderate effect upon the closest noise sensitive receptors during short periods as plant operates closest to the surrounding residential properties.

11.4.7 As the infrastructure works progress away from the existing dwellings, during the construction of the main areas of the Proposed Development, it is anticipated that noise associated with the construction works would remain below 70 dB L_{Aeq} and result in a negligible effect upon existing residential receptors.

11.4.8 Noise levels associated with the main construction of the Proposed Development would result in lower levels of noise, as the requirement for heavy plant would be less. It is anticipated that the general construction activities would result in a negligible effect on the existing residential receptors.

11.4.9 Mitigation measures and a noise control regime would be adopted where high noise levels were anticipated to reduce any potential effects and these are discussed in the following section.

Operation

Changes in Road Traffic Noise Levels on Roads Surrounding the Proposed Development

11.4.10 Potential effects associated with the additional traffic from the operation of the Proposed Development and other committed developments considered within this assessment have been identified on the basis of a change in the Basic Noise Level (i.e. that calculated at a distance of 10 metres from the kerb).

11.4.11 The assessment has considered the road links directly adjacent to the Application Site and elsewhere where changes in road traffic flows as a result of the development are anticipated to change by more than 10% (a 20% change is generally equivalent to 1 dB(A) change in noise levels).

11.4.12 The details of the calculations are provided in **Appendix 11.1** and have been summarised below.

Table 11.3 Change in Road Traffic Noise Levels on Roads Surrounding the Proposed Development

Road Link	Change in Basic Noise Level [dB $L_{Aeq, 16\ hour}$]		
	2024 Forecast Year - 2019 Base	2024 Forecast Year + Proposed Development - 2019 Base	2024 Forecast Year + Proposed Development - 2024 Forecast Year
Harp Hill West of Proposed Development Access	+0.2	+1.3	+1.1
Harp Hill West of Stanley Road	+0.2	+1.2	+1.0

11.4.13 Road traffic flows on road surrounding the Proposed Development are anticipated to result in increases in traffic flows of below 10%, which would result in a change in noise levels of less than 1 dB(A). This change would not result in any adverse noise impacts.

11.4.14 As indicated in **Table 11.3** above, higher increase in noise levels are anticipated along Harp Hill to the west of the Proposed Development access. Increases of up to 1.3 dB(A) are anticipated along this road with the Proposed Development operational and taking account of other committed developments. The increase in noise levels would not be perceptible under normal listening conditions and would result in a negligible adverse noise impact. No significant effects have therefore been identified as a result of the additional traffic.

Proposed Residential Properties

11.4.15 The noise monitoring undertaken indicated low levels of noise across the site, both during the day and night-time periods, with noise levels during the daytime periods principally influenced by distant road traffic and the occasional light aircraft flying overhead.

11.4.16 The noise monitoring indicated daytime levels of 50 dB $L_{Aeq,\ 16\ hour}$ or lower and 40 dB $L_{Aeq,\ 8\ hour}$ night-time within the proposed residential areas.

11.4.17 An acceptable noise environment would be achieved using standard construction techniques to ensure the requirements of BS 8233 were met, both internally and within the gardens of the dwellings. On this basis, no specific noise mitigation measures have been identified to be required for the proposed dwellings.

11.5 MITIGATION AND ENHANCEMENT

Mitigation by Design

Construction

11.5.1 Adverse effects are anticipated when construction activities are carried out in close proximity to existing noise sensitive receptors. Mitigation measures will be implemented to ensure that any potential effects are reduced to satisfactory levels, which include:

- Adopting a Construction Environmental Management Plan;
- Adopting the principle of Best Practicable Means to reduce noise levels during the construction work;
- Selection of the most appropriate plant to minimise noise levels;
- The use of localised site hoardings where the noise levels are likely to be above acceptable limits;
- Monitoring of noise levels at noise-sensitive properties during certain periods of the construction; and
- Regular liaison with local residents to inform them of periods where noise levels are likely to be higher.

11.5.2 Through the use of appropriate mitigation and control measures adopted during the construction phase of the Proposed Development, potential adverse effects and residual effects would be minimised.

Road Traffic Noise

11.5.3 Changes in road traffic noise levels on surrounding roads would result from the operation of the Proposed Development. The assessment indicates that the increases would not result in any significant adverse effects and consequently no additional noise mitigation measures have been identified to be required.

Proposed Dwellings

11.5.4 The residential areas of the Proposed Development would be located away from potential noise sources and there is no need for specific noise mitigation measures to ensure a satisfactory noise environment to meet the requirements of BS 8233 and the NPPF.

11.5.5 A summary of the mitigation measures which would be incorporated into the design are provided in **Table 11.4.**

Table 11.4: Mitigation

Ref	Measure to avoid, reduce or manage any adverse effects and/or to deliver beneficial effects	How measure would be secured		
		By Design	By S.106	By Condition
1	Control of noise during construction of the Proposed Development to ensure Best Practicable Means adopted and to control working hours			X
2	Ensure noise levels within dwellings meet the requirements of BS 8233 to ensure a satisfactory noise environment.	X		

11.6 CUMULATIVE AND IN-COMBINATION EFFECTS

11.6.1 Potential cumulative effects in relation to noise would be associated with increases in road traffic on the surrounding road network, with the Proposed Development and other committed developments operational.

11.6.2 The road traffic noise assessment presented previously has considered other committed developments within the forecast traffic flows assumed within the calculations.

11.6.3 No cumulative noise effects have been identified within this assessment, associated with the operation of the Proposed Development and other committed developments.

11.7 SUMMARY

Introduction

11.7.1 A noise assessment has been carried out for the Proposed Development.

11.7.2 The assessment has taken account of potential effects during the construction and operation of the Proposed Development, upon existing residential receptors and dwellings within the Proposed Development.

Baseline Conditions

11.7.3 A series of noise surveys were carried out to ascertain the noise levels around the Proposed Development, which have been used as the basis of the current assessment to identify potential effects.

11.7.4 Noise levels within the Proposed Development were generally low and principally influenced by distant road traffic travelling along surrounding roads and occasional light aircraft operating into Gloucestershire Airport during daytime periods.

Likely Significant Effects

11.7.5 The construction of the Proposed Development has the potential to give rise to short term adverse effects upon existing noise sensitive receptors surrounding the site. Appropriate mitigation and control measures would be adopted during construction to ensure any potential effects were minimised.

11.7.6 Road traffic on the roads within and surrounding the Proposed Development would change as a result of the occupation and operation of the completed scheme and other committed developments in the surrounding area. The assessment indicates that the additional road traffic would result in no significant adverse effects.

Mitigation and Enhancement

11.7.7 No additional noise mitigation measures have been identified in addition to those which would be incorporated into the design of the Proposed Development and considered at detail design stage.

Conclusion

11.7.8 In summary, with appropriate mitigation and control measures adopted during the construction of the Proposed Development, potential noise and vibration effects would be reduced to an acceptable level, thus ensuring the Application Site is suitable for a residential led development.

11.7.9 **Table 11.5** provides a summary of the effects, mitigation and residual effects.

Table 11.5: Summary of Effects, Mitigation and Residual Effects

Receptor/ Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value **	Magnitude of Effect **	Geographical Importance ***	Significance of Effects ****	Mitigation/ Enhancement Measures	Residual Effects ****
Construction								
Residential receptors	Noise and vibration associated with construction	Temporary	Not Applicable	Not Applicable	Local	Minor adverse	Appropriate control measures	Negligible
Operation								
Noise within proposed dwellings	Noise levels from surrounding land uses and roads	Permanent	Not Applicable	Not Applicable	Local	No Impact	None identified	No Impact
Cumulative and In-combination								
Road Traffic	Increases in road traffic noise levels resulting from operation of proposed developments	Permanent	Not Applicable	Not Applicable	Local	Negligible Adverse	None identified	Negligible Adverse

References

11.1 British Standards Institute. Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise. BS 5228+A1: 2014.

11.2 British Standards Institute. Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration. BS 5228+A1: 2014.

11.3 British Standards Institute. Evaluation and Measurement for Vibration in Buildings. Part 2. Guide to Damage Levels from Groundborne Vibration. BS 7385: Part 2. 1993.

11.4 British Standards Institute. Guidance on Sound Insulation and Noise Reduction in Buildings – Code of Practice. BS 8233: 2014.

11.5 World Health Organisation. Guidelines for Community Noise. 1999. WHO Geneva.

11.6 Highways Agency. Design Manual for Roads and Bridges. Volume 11. Section 3. Part 7. HD 213/11 – Revision 1. Noise and Vibration. November 2011.

12 HYDROLOGY, DRAINAGE AND FLOOD RISK

12.1 INTRODUCTION

12.1.1 This chapter provides an assessment of the likely significant effects of the Proposed Development on Hydrology, Drainage and Flood Risk.

12.1.2 The purpose is to identify surface water and groundwater features and characteristics in the vicinity of the Proposed Development; to identify the potential effects, without mitigation, of the Proposed Development; to propose mitigation strategies for any potential effects; to review the efficiency of the proposed mitigation measures; and to identify the residual significant effects.

12.1.3 The chapter is informed by the Flood Risk Assessment & Drainage Strategy included in **Appendix 12.1**.

12.2 ASSESSMENT APPROACH

Methodology

12.2.1 The assessment methodology initially identifies the baseline conditions relating to hydrology, drainage and flood risk. The potential effect of the Proposed Development is then assessed; and the magnitude and significance of the effects on the water environment identified. Mitigation measures are then considered to counter any adverse effects and where possible seek to enhance the water environment. Finally, any significant residual effects that remain following completion of the Proposed Development and mitigation measures are assessed and identified.

Table 12.1 – Significance Criteria for Hydrology, Drainage & Flood Risk

Significance of Effect		Description
Negligible/Neutral/ Not Significant		No appreciable effect to humans, aquatic flora and fauna, flood risk, water resources or water quality. Any minor effects are reversible.
Minor	Adverse	Temporary and minor detrimental effect to local watercourses. Moderate temporary local flooding without causing inconvenience or damage. Moderate local scale reduction in water quality and water resources reversible with time. Reversible detrimental effects on aquatic flora and fauna.
	Beneficial	Minor reduction in risk to humans, aquatic flora and fauna. Minor localised improvement to water quality and water resources. Minor reduction in flood risk.
Moderate	Adverse	Moderate detrimental effect to local watercourses. Severe temporary flooding or change to flow characteristics of watercourses resulting in minor inconvenience but no damage. Severe temporary reduction in water quality and water resources. Severe temporary effect on aquatic flora and fauna.
	Beneficial	Moderate reduction in risk to humans, aquatic flora and fauna. Moderate localised improvement to water quality and water resources. Moderate reduction in flood risk.
Major	Adverse	Severe detrimental effect to local watercourses. Severe or permanent flooding or change to flow characteristics of watercourses resulting in significant inconvenience and damage to property. Severe permanent reduction in water quality and water resources. Severe permanent effect on aquatic flora and fauna. Risk to human life.
	Beneficial	Substantial reduction in risk to humans, aquatic flora and fauna. Significant improvement to water quality and water resources. Significant reduction in flood risk.

12.2.2 Policy Framework:

- National Planning Policy Framework: 2019
- Planning Practice Guidance: Climate Change: 2019
- Planning Practice Guidance: Flood Risk and Coastal Change: 2014
- Planning Practice Guidance: Water Supply, Wastewater and Water Quality: 2019
- Water Framework Directive: 2000
- Flood and Water Management Act: 2010
- Water Resources Act: 1991
- Groundwater (England & Wales) Regulations: 2009
- Land Drainage Act: 1991 & 1994
- Reservoirs Act: 1975
- Environment Agency Guidance on Pollution Prevention
- EU Floods Directive: 2007
- Flood Risk Regulations: 2009
- River Severn: Catchment Flood Management Plan: 2009
- Severn River Basin Management Plan: 2018
- Joint Core Strategy for Gloucester, Cheltenham, & Tewkesbury: 2017
- Cheltenham Local Plan: 2006
- Emerging Cheltenham Plan
- Sustainable Drainage Systems SPG: 2003
- Gloucestershire Level 1 Strategic Flood Risk Assessment:2008
- Cheltenham Borough Council Level 1 Strategic Flood Risk Assessment: 2008
- Ciria C753 The SuDS Manual: 2015
- None-Statutory Technical Standards for Sustainable Drainage: 2015
- Flood Risk Assessments: Climate Change Allowances: 2019
- Sewers for Adoption 7th Edition: 2012

Scoping Criteria

12.2.3 Cheltenham Borough Council, Gloucestershire County Council (LLFA), the Environment Agency, and Severn Trent Water have been consulted regarding the Proposed Development and the scope of the chapter on Hydrology, Flood Risk and Drainage.

12.2.4 Cheltenham Borough Council Scoping Opinion Response July 2019:

> **Officer Comments:**
>
> **Further detail will be required of the cumulative effects of the proposed development with other relevant existing or proposed developments within the area; and the interrelationship between issues, particularly with regards to infrastructure and services, traffic generation, flood risk potential and impact on the AONB.**
>
> **Severn Trent Water:**
>
> **Severn Trent Water confirm that they have no objections to the proposals subject to the inclusion of the following condition:**

o the development hereby permitted should not commence until drainage plans for the disposal of foul and surface water flows have been submitted to and approved by the Local Planning Authority, and

o the scheme shall be implemented in accordance with the approved details before the development is first brought into use. This is to ensure that the development is provided with a satisfactory means of drainage as well as to prevent or to avoid exacerbating any flooding issues and to minimise the risk of pollution.

Environment Agency EIA Scoping Opinion Response June 2019:

Whilst we do not consider there to be any significant environmental issues within our remit, the following should be considered either as part of the EIA should other consultees advise such, or in support of any subsequent planning application.

Flood Risk (Surface Water Run-off):

Based on our 'indicative' Flood Map for Planning (Rivers and Sea) the site is located within Flood Zone 1: 'low probability' of fluvial flooding and comprises of land which has a less than 1 in 1000 annual probability of river flooding (<0.1%).

Our maps indicate that the north east section of the site is identified as being at risk of reservoir flooding. This relates to the covered reservoir to the east of the site which we understand is a Severn Trent Water Ltd asset called 'Hewletts Number 3'. (We note there is also an additional smaller reservoir further to the east.) This/these feature(s) and any associated risk to the proposed development should be investigated at an early stage to inform the layout and design of the proposals.

It should also be noted that an ordinary watercourse runs adjacent to the northern boundary of the site. Please note our Flood Maps primarily show flooding from main rivers, not ordinary watercourses with a catchment of less than 3km2. Therefore, an assessment of flood risk associated with these unmodelled watercourses may also be necessary. Furthermore, the developer should investigate whether there are any culverted watercourses on/near the site and pursue opportunities to restore these to open watercourses as part of the development to deliver flood risk improvements.

<u>Flood Risk Assessment</u> - Given the size of the site (approximately 15 hectares in size), a Flood Risk Assessment (FRA) will need to be undertaken, in line with the National Planning Policy Framework (NPPF), as part of the EIA.

We note that the scoping report states an assessment of flood risk will be undertaken within Chapter 3.85 of the Environmental Statement (ES). The FRA should consider all

sources of flooding and be undertaken in line with the NPPG, which contains a useful checklist for FRAs at sub-section 26 of the Flood Risk and Coastal Change Section.

The FRA should contain a Drainage Strategy for the management of surface water, as the development of sites of this size can generate significant volumes of runoff. The steepness of the site will also be a consideration. On site surface water attenuation will be required for events with flow probabilities of up to and including the 1 in 100-year event (including an appropriate allowance for climate change), through the incorporation of sustainable drainage principles (SuDS), to balance surface water run-off to Greenfield run-off rates.

The developer should contact Gloucestershire County Council (as the Lead Local Flood Authority) and your own Land Drainage Engineer for advice on their surface water drainage requirements and to confirm whether they have any records of the site flooding from sources other than fluvial. We note this has been acknowledged in section 3.87 of the report. Furthermore, there may be opportunity for offsite flood risk betterment in connection with the Council's nearby Wyman's Brook flood scheme.

The findings of the FRA should be used to inform the site layout of the proposed development and in identifying appropriate mitigation and enhancement measures.

Water Quality and Water Framework Directive:

The Government is currently committed to improving the quality of our watercourses through the requirements of the Water Framework Directive (WFD). The developer should maximise the opportunities for significant incorporation of features and schemes to improve the quality of watercourses identified in the report. The site falls within the WFD catchment (reference GB109054039780) 'Swilgate – source to confluence River Avon', which is currently afforded 'moderate' status.

The WFD requires all water bodies to achieve 'Good Ecological Status' by 2027. No development should be permitted if it will result in any deterioration in the quality of any waterbody. All appropriate measures should be taken to bring about improvements in the morphology and condition of watercourses.

We would expect the subsequent planning application to detail any impacts on the water environment in the context of the WFD. This would include any impacts on the watercourses close to the site, the groundwater below and any water features in hydraulic continuity. This evaluation is important in the context of the WFD and for the protection and enhancement of the water environment. This work should identify existing pressures on the waterbody; measures to ensure there is no deterioration in ecological status and

measures to ensure the achievement of this is not precluded in the future. Measures to improve the ecological status of the water bodies should also be identified as part of any assessment. This might include the positive contribution that SuDS can play to water quality.

Foul Drainage and Water Supply:

Severn Trent Water Ltd must be consulted in detail on foul drainage proposals. No development should commence until a satisfactory scheme for foul drainage that satisfies all requirements including those of the WFD has been approved. The developer must provide evidence and agreement from Severn Trent that there will be adequate capacity provided within the local sewerage infrastructure (sewer, pumping stations, sewage works). Consideration should also be given to water resources and supply as a potential issue, including in relation to climate change.

LLFA, Gloucestershire County Council Scoping Opinion Response June 2019:

The LLFA confirmed that the proposed site is within the Environment Agency's Flood Zone 1. Also, according to the Environment Agency's interactive flood maps and the surface water management plan produced for the Priors Oakley Flood Alleviation Scheme led by the County Council, there is some risk of surface water flooding to the site during the 1 in 100-year rainfall event. Whilst there are no known reported surface water flood incidents on this particular site, properties immediately downstream of this site and the Wyman's brook are known to have experienced flooding historically and this should be taken into account within any flood risk assessment and drainage proposals for this site. Ultimately, the applicant should take into account the wider catchment and overland flows onto the site from the elevated topography to the south east.

In respect of an EIA for this development, any surface water drainage/ flood risk issues should be adequately dealt with to ensure betterment and that there is no increased flood risk to the site or downstream of the site. This would normally be dealt with by a flood risk assessment and detailed drainage strategy submitted as part of a substantive planning application. The LLFA would require surface water discharge to follow the sustainable drainage (SuDS) hierarchy and to mimic the existing natural Greenfield Runoff Rate and volumes for all events up to and including the 1 in 100-year storm (plus 40% climate change allowance). This is particularly critical at this location as the immediate area downstream of this site is known to be at flood risk.

Any development proposals should show that there would be no flooding on the site up to the 1 in 30-year rainfall event and that no building including basements should suffer

flooding up to and including the 1 in 100-year storm (including 40% increase for climate change). Flows in excess of the 1 in 100-year rainfall event should be managed in exceedance routes that minimise the risks to people and property.

12.3 BASELINE CONDITIONS

Site Description and Context

12.3.1 The application site is located approximately 2.2Km east of Cheltenham town centre. The site comprises a broadly rectangular in shape plot of land located on the northerly facing slope of Harp Hill comprising several grass covered fields with derelict farm buildings associated with Oakley Farm located in the central northern part of the site. The site is bounded to the south by Harp Hill road and residential housing, to the west by residential housing and to the north / northeast by recently constructed residential development. The site is bounded to the east by Hewletts reservoir's (buried reservoir's) which is maintained by Severn Trent Water. A full description of the Application Site and the Proposed Development are contained in Chapter 3 of this ES.

12.3.2 The application site falls from the southeast to the northwest with levels varying from approximately 126mAOD to 77mAOD. The gradient is generally approximately 1:8 with a flatter area in the southeast. Full details are included in **Appendix 12.1**.

Geology

12.3.3 Baseline geology is covered in detail in Chapter 13: Ground Conditions and Contamination.

12.3.4 Geological Survey of Great Britain mapping shows the Application Site to be entirely underlain by bedrock of Charmouth Mudstone Formation of the Jurassic age, which usually comprise firm to stiff, grey brown, plastic clay, which grades at depth to dark grey, fissured mudstone. Superficial deposits have not been recorded for this site. (refer to mapping in **Appendix 12.1**).

Hydrogeology

12.3.5 Baseline hydrogeology is covered in detail in Chapter 13: Ground Conditions and Contamination.

12.3.6 Copies of the EA online mapping for hydrogeology and groundwater and included in **Appendix 12.1**.

12.3.7 The EA online groundwater mapping shows that the site is not in a Groundwater Source Protection Outer Zone.

12.3.8 The mapping shows that approximately 1.2km to the east of the site is a Groundwater Source Protection Zone I (Inner Protection Zone), Zone II (Outer Protection Zone), and Zone III (Total catchment).

12.3.9 Zone 1: (Inner Protection Zone) - This zone is defined by a travel time of 50-days or less from any point within the zone at, or below, the water table. Additionally, the zone has as a minimum a 50-metre radius. It is based principally on biological decay criteria and is designed to protect against the transmission of toxic chemicals and water-borne disease. Zone 2: (Outer Protection Zone) - This zone is defined by the 400-day travel time from a point below the water table. Additionally this zone has a minimum

radius of 250 or 500 metres, depending on the size of the abstraction. The travel time is derived from consideration of the minimum time required to provide delay, dilution and attenuation of slowly degrading pollutants. Zone 3: (Total catchment) - This zone is defined as the total area needed to support the abstraction or discharge from the protected groundwater source.

12.3.10 EA online mapping for groundwater vulnerability shows the site to be in an unclassified area with no aquifer designation.

12.3.11 The site is not within a drinking water safeguard zone, the nearest Safeguard Zone (Groundwater) is approximately 2km to the east of the site.

12.3.12 Groundwater was not encountered in any of the exploratory boreholes however subsequent monitoring of those boreholes installed with standpipes (response zones of between 1.0m and 4.0m depth) indicated that groundwater does percolate slowly through the subsoil (most likely through fissures).

12.3.13 The site is considered to be within an area of low sensitivity in terms of Hydrogeology and groundwater resources.

Hydrology

12.3.14 The nearest main river to the application site is Wyman's Brook (tributary of River Swilgate) located approximately 0.2km to the north of the site. Ham Brook and the River Chelt are located approximately 1.4Km to the south of the site. The existing hydrological features are shown on the topographical survey included in **Appendix 12.1**, Appendix B.

12.3.15 Water Framework Directive River Basin Management Plan (WFD), EA online mapping shows the River Swilgate to have a Moderate Overall Classification in 2016. The Severn River Basin Management Plan aims to achieve Good Status by 2027.

12.3.16 Based upon the above information the site is considered to be within an area of moderate sensitivity in terms of Hydrology.

Surface Water Drainage

12.3.17 The surface water drainage for the Application Site is outlined in more detail in the FRA and Drainage Strategy included at **Appendix 12.1**.

12.3.18 The topographical survey shows two existing ditches running along part of the northern boundary, one being located to the east near Brockweir Road and the other running parallel to Pillowell Close. The survey also shows two internal land drainage ditches within the site and a land / collector drain running across the north-eastern part of the site.

12.3.19 Following on site drainage investigation it has been established that both internal ditch systems and existing land drains eventually outfall into an open brick chamber with a metal grill over located in the access track to Oakley Farm, adjacent to Pillowell Close. The 375mm outlet from this chamber follows the Oakley Farm access track and connects to the existing surface drainage system located on the B4075 (Priors Road) to the west.

12.3.20 The 750mm surface water drain running parallel to Brockweir Road has been traced and confirmed to outfall into Wyman's Brook to the north.

12.3.21 There is existing highway drainage within Harp Hill Road to the south of the site. This is believed to drain west towards the B4075 (Priors Road).

12.3.22 The upper soils comprise of impermeable clays; infiltration tests carried out in the clay soils failed confirming that the use of soakaways and other forms of infiltration will not be possible.

12.3.23 Based upon the above information the Application Site is considered to be within an area of moderate sensitivity in terms of hydrology.

Foul Drainage

12.3.24 The foul drainage for the Application Site is outlined in more detail in the FRA and Drainage Strategy included at **Appendix 12.1**.

12.3.25 There are no existing public sewers within the Application Site. The nearest public foul sewers are located within Brockweir Road and Pillowell Close to the north, Hill View Road and Wessex Drive to the west, and Harp Hill to the south. There are a number of private foul rains associated with the now derelict Oakley Farm buildings, however the farm buildings and associated drainage will be removed as part of the proposed development.

12.3.26 Based upon the above information the Application Site is considered to be within an area of low sensitivity in terms of foul sewerage.

Flood Risk

12.3.27 The flood risk for the Application Site is outlined in more detail in the FRA and Drainage Strategy included at **Appendix 12.1**.

12.3.28 EA mapping included in **Appendix 12.1** shows the site to be entirely within Flood Zone 1 having a less than 1:1,000 annual exceedance probability of fluvial flooding. The nearest fluvial flood risk shown on the mapping is to the west of the Application Site associated with the River Swilgate.

12.3.29 Mapping for surface water included in **Appendix 12.1** shows areas of low flood risk from rainfall and surface water run-off for the Application Site associated with the ditches to the north and the ditches within the site. The surface water flood risk model and mapping is generated by dropping rainfall on the site and seeing where it runs and collects. High risk is > 1:30, medium risk 1:30 to 1:100, and low risk 1:100 to 1:1,000.

12.3.30 The SFRA maps included in **Appendix 12.1** show historic flooding in 2007 to the north along Imjin Road, Priors Road, and Whaddon Road from Wyman's Brook. The mapping also shows incidents in Hill View Road and Wessex Drive to the west and Harp Hill to the south; these are likely to be the result of localised flooding from sewers that are unable to cope with the amount of run-off during more extreme rainfall events.

12.3.31 The EA online mapping included in **Appendix 12.1** identifies potential flooding from the Cirencester Park Mansion Lake however this does not extend to the site. Reservoir flooding is extremely unlikely to happen. There has been no loss of life in the UK from reservoir flooding since 1925. All large reservoirs must be inspected and supervised by reservoir panel engineers. As the enforcement authority for the Reservoirs Act 1975 in England, the Environment Agency ensure that reservoirs are inspected regularly and essential safety work is carried out.

12.3.32 The EA online mapping included in **Appendix 12.1** shows that part of the site is located within the flood risk extents for Hewletts Reservoirs located immediately to the east. Hewletts reservoir's is owned and maintained by Severn Trent Water. It has been reported following consultation with an on-site Severn Trent Water operative that the northernmost reservoir is now empty and has been infilled. The southernmost reservoir is a covered structure and is still operational supplying water by gravity to local residential housing. Reservoir flooding is extremely unlikely to happen. There has been no loss of life in the UK from reservoir flooding since 1925. All large reservoirs must be inspected and supervised by reservoir panel engineers. As the enforcement authority for the Reservoirs Act 1975 in England, the Environment Agency ensure that reservoirs are inspected regularly, and essential safety work is carried out. In the unlikely event that the reservoir did flood, flood water would naturally drain towards the site and be collected by the existing internal land drainage ditches and safely conveyed through the site.

12.3.33 The Application Site is entirely Flood Zone 1 having a low flood risk, less than 1:1,000 or 0.1% annual probability of river or sea flooding in accordance with Table 1 of Planning Practice Guidance Flood Risk and Coastal Change.

12.3.34 The FRA has considered flood risk from all sources: rivers & sea, groundwater, sewers, surface water run-off, and artificial sources (reservoirs, canals, etc.).

12.3.35 The major adverse risk is from surface water run-off (rainfall) on-site and downstream.

12.4 LIKELY SIGNIFICANT EFFECTS

Construction

12.4.1 The likely significant effects which could occur during construction are outlined below.

Flooding

12.4.2 Direct and indirect flooding and changes to baseline hydrology resulting from the disturbance and reprofiling of ground and creation of new impermeable surfaces during the construction works.

Water Quality

12.4.3 Direct and indirect contamination of surface and groundwater resulting from the mobilisation of soils; contaminated waste; chemicals and hazardous substances; construction materials; contaminants; and spillages of oils and similar pollutants such as lubricants and hydraulic fluids from construction plant.

12.4.4 Compromise the attainment of the Water Framework Directive (WFD) objectives by preventing the River Swilgate achieving 'Good' overall status by 2027 (currently 'Moderate' status).

Operation

12.4.5 The likely significant effects which could occur during operation are outlined below.

Flooding

12.4.6 Direct and indirect flooding of downstream property due to an increase in surface water run-off from positively drained impermeable areas.

12.4.7 Direct flooding of the Proposed Development due to inadequate drainage and management of residual flood risk.

Water Quality

12.4.8 Direct contamination or deterioration of surface water and groundwater quality due to leakages or spillages of fuel oils and other contaminants within the Proposed Development collected by the surface water drainage system (roads, roofs and hard-standings).

12.4.9 Direct and indirect contamination of surface water, soils and groundwater resulting from the surcharging of foul sewers and the discharge of untreated flows.

12.4.10 Increased flows to the receiving STW resulting in an increase in the volume of treated effluent and a reduction in the quality of treated effluent.

12.4.11 Compromise the attainment of the Water Framework Directive (WFD) objectives by preventing the River Swilgate achieving 'Good' overall status by 2027 (currently 'Moderate' status).

12.5 MITIGATION AND ENHANCEMENT

12.5.1 To minimise the potential environmental effects, mitigate for any adverse effects, enhance the water environment where possible, and ensure that the WFD objective are not compromised, the following specific measures are proposed:

- Careful design of the Proposed Development in accordance with national and local policies.
- Sequential approach to locate development in area at lowest risk of flooding and to ensure compatibility in accordance with **Table 12.2** below (Table 3: Planning Practice Guidance: Flood Risk and Coastal Change).

Table 12.2: Flood risk vulnerability and flood zone 'compatibility'

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

- Measures to reduce and manage surface water run-off to prevent, and where possible reduce flood risk.
- The use of a Sustainable Drainage System (SuDS) to reduce run-off, attenuate surface water, manage flood risk, and provide improvements in water quality.
- Measures to take into consideration climate change and the predicted increase in rainfall intensity over the lifetime of the development.
- Measures to manage any residual flood and pollution risks.
- Efficient collection, conveyance and treatment of foul sewage from the Proposed Development.
- Measures to ensure that the drainage for the Application Site is maintained and operates effectively for the lifetime of the development.

Construction

Flooding During Construction of the Proposed Development

12.5.2 Changes to the baseline hydrology and flooding occur as a result of various construction related activities, such as; reprofiling of land altering preferential drainage flow paths and flood routes; introduction of impermeable surfaces; and dewatering of excavations. Such effects can have significant consequences without mitigation.

12.5.3 The implementation of the SuDS will be phased to ensure that adequate attenuation and outfalls are provided at an early stage during construction. The SuDS features will be used to manage and attenuate surface water thus preventing an increase in flood risk during construction, and as additional impermeable areas are introduced. Prior to completion and handover of the SuDS features to the management body or purchaser excess silt will be removed and any remedial works required carried out to ensure that the features will operate effectively.

12.5.4 The contractor will not be permitted to temporarily store materials or introduce 'borrow pits' or the like in areas that may affect drainage flow paths. In instances where it is not possible to maintain existing flow paths temporary arrangements will be

implemented to ensure that routes are maintained and flood risk is not increased. Where necessary details of temporary arrangements will be agreed with the relevant regulatory bodies.

12.5.5 Dewatering of excavations, where required, will be designed to have no material effect on potential receptors such as the local watercourses. Where it is not possible to use the SuDS system to attenuate flows from dewatering to manage flooding additional temporary lagoons shall be used. Details of any such temporary arrangements will be agreed with the relevant regulatory bodies.

12.5.6 Implementation of appropriate working practices will ensure that there are negligible flooding environmental effects resulting from the construction of the Proposed Development.

Surface Water Drainage

12.5.7 The implementation of the surface water drainage and SuDS will be phased to ensure that adequate attenuation and outfalls are provided at an early stage during construction. The phasing of the SuDS will prevent an increase in flood risk downstream and will ensure that the Proposed Development is not at risk of flooding.

12.5.8 The surface water drainage & SuDS will collect rainfall and convey it to the attenuation pond where it will be stored and allowed to discharge downstream at a controlled reduced rate.

12.5.9 The phased provision of the SuDS will ensure that there is no adverse effect resulting from surface water during construction of the Proposed Development.

Foul Drainage

12.5.10 The contractor will make arrangements for the disposal of sewage from welfare facilities, and any other facilities or processes that result in foul flows, until a suitable mains foul sewer connection is available.

12.5.11 The foul drainage will be phased to ensure that all parts of the development have mains connections before they are occupied. Where this is not possible temporary arrangements will be made to contain and dispose of sewage to a suitable treatment facility.

12.5.12 The phasing of the foul drainage and connections to existing Severn Trent Water foul sewerage infrastructure will be carried out in accordance with the requirements of Severn Trent Water, including any improvements or phasing that are required to accommodate flows from the development.

12.5.13 The phased provision of the foul drainage will ensure that there is no adverse effect resulting from foul sewage during construction of the Proposed Development.

Water Quality During Construction of the Proposed Development

12.5.14 Disturbance of the ground during construction has the potential to contaminate the soil and both ground and surface waters due to discharge of solids into water or by the short term mobilisation of any background contaminants within the soil matrix.

12.5.15 The discharge of suspended solids to drains, watercourses and ground waters will be avoided by prohibiting any temporary construction discharge without the prior approval of the relevant regulatory bodies.

12.5.16 The implementation of the surface water drainage and SuDS will be phased to ensure that adequate attenuation and outfalls are provided at an early stage during construction to remove silts and pollutants. Prior to completion and handover of the SuDS features to the management body or purchaser excess silt will be removed and any remedial works required carried out to ensure that the features will operate effectively.

12.5.17 Where it is not possible to use the SuDS to manage and remove silt additional temporary features such as settlement lagoons and silt removal devices such as 'Silt Busters' will be used. Details of any such features and devices will be discussed and agreed with the relevant regulatory bodies.

12.5.18 Discharges of any polluted waters resulting from construction activities (primarily waste from welfare facilities) will generally be directed to foul sewers, subject to the conditions and approval of the drainage authority. Where it is not possible to discharge to foul sewers waste and polluted water will either be contained on-site and tankered off-site to a suitable treatment/disposal facility.

12.5.19 Earthworks will be completed in a manner that protects the water quality environment and ecological interest of the site. The nature of the works and the proposed implementation methods will be agreed with the Environment Agency in advance, and all works will accord with the recommendations of EA guidance documents. The main effect on water quality during earthworks operations is the management of silt during periods of rainfall as discussed above.

12.5.20 If necessary turbidity monitoring will be carried out in the watercourses to check silt levels and to identify any significant increase in the level of silt resulting from the construction works. If significant levels are detected resulting from the construction works then additional silt control measures will be used to ensure that there is no adverse effect.

12.5.21 Other potential effects relate to the contractor's working practices. For example, there is the potential for fuel oil spillage from stored materials supplying site plant. This potential effect will be controlled by storing such materials within bunded tanks. The works will be completed in a manner that is consistent with the need to protect the surface and ground water quality environment.

12.5.22 The contractor will assess construction related risks and effects, and implement any necessary controls in accordance with industry good practice techniques. The contractor will develop emergency spillage, flood, fire and contamination control procedures such that any inadvertent incidents are immediately controlled to minimise the potential effect. All works will be completed in accordance with the Environment Agency guidance documents together with current best practice measures for the management of construction activities.

12.5.23 Proposed implementation methods will be developed with the Environment Agency in advance of all works, with appropriate construction phase method statements prepared to ensure that no effect on the site hydrology or hydrogeology results from the construction activities.

12.5.24 The construction of the Proposed Development would result in a major adverse effect on water quality however with mitigation this will be reduced to a temporary minor adverse effect. Any adverse effect is likely to be reversible in the short-term.

Table 12.3 Summary of Hydrological, Drainage and Flooding Construction Effects

Construction Effects	Significance
Flooding	Negligible
Surface Water Drainage	Negligible
Foul Drainage	Negligible
Water Quality	Minor Adverse (short-term)

Operation

Flooding During Operation of the Proposed Development

12.5.25 The Flood Risk Assessment and Drainage Strategy included at **Appendix 12.1** demonstrates that the proposed dwellings will be located in Flood Zone 1 with a low risk of flooding (less than 0.1% or 1 in 1,000 annual exceedance probability of fluvial flooding) and that they will not be at risk from other sources of flooding. This is in accordance with the NPPF sequential approach to locating development in areas of lowest flood risk.

12.5.26 The proposed SuDS identified within the appended FRA and Drainage Strategy (**Appendix 12.1**) will intercept rainfall and run-off, attenuate it and allow it to discharge downstream at a controlled reduced rate. The drainage system and attenuation will be designed for the 1:100 event including a 40% allowance for climate change, in accordance with guidance and standards.

12.5.27 Restricting the discharge from the site to the existing green-field mean annual flood flow (approximately the 1:2 event green-field run-off) will ensure that there is no increase in flood risk and will reduce flood risk downstream, particularly during more extreme events.

12.5.28 The SuDS will be designed to include an allowance for climate change in accordance with the Environment Agency guidance (40% for residential development to 2115). This will ensure that flood risk is not increased over the lifetime of the development.

12.5.29 As identified in the FRA (**Appendix 12.1**), to manage any residual flood risk the Proposed Development will include flood exceedance routes to direct any flows from extreme events or localised failures safely to the downstream surface water drainage system, and attenuation pond. Floor levels will be set a minimum of 150mm above adjacent ground levels to protect them from potential flooding from surface water run-off. This will ensure that new properties are not at risk from localised flooding and that flood risk downstream is not increased.

12.5.30 Pluvial flood risk from surface water (rain falling on the Proposed Development) will be managed through the use of SuDS. The proposed drainage system will collect the surface water run-off and convey it to the attenuation pond to ensure that the development is safe from surface water flooding and that flood risk downstream is not increased.

12.5.31 The proposed mitigation measures will result in a minor beneficial effect by managing surface water run-off from the Proposed Development and reducing flood risk in the area.

Surface Water Drainage

12.5.32 The implementation of the surface water drainage and SuDS will be phased to ensure that adequate attenuation and outfalls are provided at an early stage during construction. The phasing of the SuDS will ensure that all areas are adequately drained prior to occupation and for the lifetime of the Proposed Development.

12.5.33 The SuDS will be managed and maintained by a public body or suitably experienced management company to ensure that it operates effectively over its lifetime. Details will be agreed with the Local Planning Authority prior to construction.

12.5.34 The provision of the SuDS will ensure that there is no adverse effect resulting from surface water for the lifetime of the Proposed Development.

Foul Drainage

12.5.35 Foul drainage from the development will discharge to the existing Severn Trent Water sewerage infrastructure. Severn Trent Water has been consulted on the capacity of their existing foul infrastructure, and the flows from the Application Site, and are assessing the impact the Proposed Development will have. Any improvements to their infrastructure to accommodate the additional flows, identified as a result of the assessment, will be secured by Severn Trent Water to ensure that there is no adverse effect.

12.5.36 The phasing of the foul drainage and connections to existing Severn Trent Water foul sewerage infrastructure will be carried out in accordance with the requirements of Severn Trent Water, including any improvements or restrictions that are required to accommodate flows from the development.

12.5.37 The main foul drainage will be adopted and maintained by Severn Trent Water, subject to approvals and agreement. The adoption by Severn Trent Water will ensure that there is no adverse effect resulting from foul sewage during the lifetime of the Proposed Development.

Water Quality During Operation of the Proposed Development

12.5.38 The proposed development will include roads, hard standings, roofs and landscaped areas. Run-off from roofs is unlikely to contain significant pollution. Run-off from roads and hard standings can pick up fuel, oil, heavy metals, rubbish and other pollutants. Run-off from landscaped areas could include pesticides and fertilisers.

12.5.39 Higher concentration of pollutants occurs in the early stages of a storm event known as the 'first flush' and is due to higher initial rainfall intensities, greater erosion potential and to greater solids and pollutants that have built up on urban surfaces during preceding dry weather. To remove pollution guidance recommends that the run-off from small frequent events and the initial run-off from larger and rarer events is captured and treated using SuDS.

12.5.40 The main techniques used to remove pollutants are filtration and detention. Improvements to storm water quality can be achieved by filtering the run-off (particularly for small frequent events) using a variety of media such as gravels (permeable paving and filter trenches), grass/vegetation (swales, basins and ponds).

12.5.41 The use of SuDS features will ensure that there is no risk of pollution to the downstream watercourses; Wyman's Brook and River Swilgate.

12.5.42 Ecological and Landscape Management Plans will include details of how the ecology of the site will be enhanced and maintained, including the green SuDS.

12.5.43 The proposed SuDS together with enhancements to the ecology of the site will ensure that the Proposed Development has no effect on water quality and will also ensure that WFD objectives for the River Swilgate are not compromised.

12.5.44 The SuDS will be managed and maintained by a public body or suitably experienced management company to ensure that it operates effectively over its lifetime. Details of the ownership, management and maintenance will be agreed with the Local Planning Authority prior to construction.

Table 12.4 Summary of Hydrological, Drainage and Flooding Operational Effects

Operational Effects	Significance
Flooding	Minor Beneficial
Surface Water Drainage	Minor Beneficial
Foul Drainage	Negligible
Water Quality	Negligible

Cumulative Effects

12.5.45 A number of significant developments in the area have been identified that could have an effect on hydrology, drainage and flood risk:

GCHQ Oakley (Oakley Grange), Priors Road, Cheltenham

12.5.46 Located directly to the north and northeast of the Application Site comprising residential development of 20ha (730 dwellings over 3 phases) and provision of district centre incorporating food superstore. The site is brown field on the former GCHQ Oakley site. No information is available on the Cheltenham Borough Council public access website for flood risk or drainage.

12.5.47 Reserved matters planning for the food superstore was approved in February 2006. Google Earth historic images show that the store it was operational in December 2006. No information is available on the Cheltenham Borough Council public access website for flood risk or drainage. It is assumed that surface water run-off from the store drains to the Wyman's Brook at Priors Road. The store has been operational for over 10 years so is not considered in the cumulative effects.

12.5.48 Phase 1 comprises of 262 dwellings with reserved matters planning approval in May 2006. Phase 2 comprises of 157 dwellings with reserved matters planning approval in April 2008. Google Earth historic images show that construction had started in December 2006 and that Phases 1 & 2 were completed prior to May 2017.

12.5.49 No information is available on the Cheltenham Borough Council public access website for flood risk or drainage. Severn Trent Water's record plans show surface water

from Phases 1 & 2 draining north to Wyman's Brook and foul to an existing sewer in Priors Road/Whaddon Road.

12.5.50 The development is brown field, a visual comparison of the GCHQ historic image and residential development indicated that overall there has been a reduction in impermeable area, this is likely to have resulted in a reduction in run-off and a reduction in flood risk downstream.

12.5.51 No information is available on water quality measures/mitigation for Phases 1 & 2 however on the basis that it is brown field development there is probably a Negligible Effect.

12.5.52 Phase 3 comprises of 311 dwellings with reserved matters planning approval in March 2014. Google Earth images show the development to be approximately 40% complete in August 2017. Only one house was available to purchase in December 2019 indicating that the development is virtually complete.

12.5.53 The Phase 3 development is in Flood Zone 1, lower parts of the development are at low risk of flooding from surface water, and a large proportion of the site is at risk from the Hewletts Reservoir.

12.5.54 Drainage information on the Cheltenham Borough Council public access website shows the site to be attenuated in an off-line basin and in large box culverts. The information states that run-off rates have been reduced by 20% compared with the rates from the previous GCHQ development providing a reduction in flood risk downstream.

12.5.55 No information is available on water quality measures/mitigation for Phase 3. The pond is off-line so does not provide any significant treatment of surface water. However, on the basis that it is brown field development there is probably a Negligible Effect.

12.5.56 The foul sewers for Phase 3 connect to the Phase 2 and 1 foul sewers, eventually discharging to the sewer in Priors Road/Whaddon Road.

12.5.57 Overall the Oakley Grange development has a Negligible Effect of Hydrology, Drainage, and Flood Risk.

<u>Bouncers Lane, Cheltenham</u>

12.5.58 Located 600m to the north of the Application Site comprising 54 dwellings. This site is a former employment site in the east of Cheltenham. Outline approval was granted in October 2017 and reserved matters approval in April 2019.

12.5.59 The outline planning application was supported by a Flood Risk assessment, this demonstrates that the site is in flood zone 1, the site is at low risk of flooding from other sources, and that SuDS could be used to manage surface water run-off from the development. A betterment in discharge rate of 70% was agreed with the LLFA compared with existing brown field run-off rates. The drainage will be designed for a 1:100 + 40% climate change event.

12.5.60 Drainage information submitted for discharge of conditions shows attenuation in oversized pipes and permeable paving parking spaces as the key elements of the SuDS to manage run-off and improve water quality.

12.5.61 On the basis that it is brown field development with SuDS the development will probably have a Moderate Beneficial Effect on Flood Risk and a Minor Beneficial Effect on

Water Quality when operational, and a Negligible Effect on Flood Risk and Minor Adverse Effect on Water Quality during demolition and construction.

Cromwell Court, Greenway Lane, Charlton Kings, Cheltenham

12.5.62 Located 30m to the southeast of the Application Site comprising 8 self & custom build dwellings. Full planning approval was granted in March 2019.

12.5.63 The application was supported by a Flood Risk Assessment that demonstrates that the site is in flood zone 1, the site is at low risk of flooding from other sources, and that SuDS could be used to manage surface water run-off from the development.

12.5.64 The proposed SuDS scheme submitted include basins, swales/ditches, porous parking areas, and green roofs to attenuate flows and improve water quality. The final discharge is to existing roadside ditches along Harp Hill and Greenway Lane. The drainage will be designed for a 1:000 + 40% climate change event with the discharge restricted to the existing green-field rates

12.5.65 Foul drainage from the development will discharge to the existing foul sewer in Harp Hill. Severn Trent has confirmed that the additional foul flows will not have an adverse effect on their sewerage network.

12.5.66 The approved development will have a Negligible Effect on Flood Risk and Minor Adverse Effect on Water Quality during demolition and construction, and using SuDS a Minor Beneficial Effect on Flood Risk and Water Quality when operational.

Emerging Local Plan Allocations HD7, HD4, & HD3

12.5.67 Policy HD7 (Priors Farm Fields) is located 200m to the north of the Application Site and has a 50-90 dwelling designation.

12.5.68 Policy HD4 (Land off Oakhurst Rise) is located 700m to the southwest of the Application Site and has a 25 dwelling designation.

12.5.69 Policy HD3 (Bouncers Lane) is located 550m to the north of the Application Site and has a 20 dwelling designation.

12.5.70 The Local Planning Authority, Lead Local Flood Authority, and Environment Agency will require all development to comply with local and national policies and thus ensure that mitigation is provided, on a similar basis to the Proposed Development, to ensure that there are no adverse effects resulting from flooding, surface water drainage, foul drainage and water quality.

Table 12.5 Summary of Cumulative Hydrological, Drainage and Flooding Operational Effects

Operational Effects	Significance
Flooding	Minor Beneficial
Surface Water Drainage	Minor Beneficial
Foul Drainage	Negligible
Water Quality	Negligible

12.5.71 Overall the cumulative effects on hydrology, drainage, and flood risk are considered to be Negligible to Minor Beneficial resulting from the longer term benefits that the use of SuDS will provide by reducing flooding, managing surface water run-off and improving water quality.

12.6 SUMMARY

12.6.1 The Application Site is considered to be in an area of low to moderate sensitivity in terms of the water environment. The baseline assessment for the site has identified flood risk from surface water, and water quality as the main areas that could be affected by the Proposed Development.

12.6.2 The construction of the proposed development will generally have a negligible effect on the water environment however during construction in the short-term there is a possible risk of temporary minor adverse effects on water quality.

12.6.3 The Flood Risk Assessment at **Appendix 12.1** demonstrates that the Proposed Development will be safe from flooding, that flood risk will not be increased downstream, and that overall flood risk in the area will be reduced.

12.6.4 The use of SuDS as mitigation will manage and reduce flood risk and will ensure that there is no adverse effect on water quality. The effects of the Proposed Development on flooding and surface water drainage are considered to be minor beneficial.

12.6.5 The foul sewage from the development can be accommodated, subject to confirmation from Severn Trent Water of any improvements required which will be secured by the Applicant and Severn Trent Water. The effect of the development on the existing foul sewerage infrastructure is therefore considered to be negligible.

12.6.6 The cumulative effect of existing, approved, and proposed development in the area has been assessed and is considered to have a negligible to minor beneficial effect on Hydrology, Drainage, and Flood Risk.

12.6.7 Overall the development is considered to have a negligible to minor beneficial effect on Hydrology, Drainage and Flood Risk.

13 GROUND CONDITIONS AND CONTAMINATION

13.1 INTRODUCTION

13.1.1 This Chapter of has been prepared to assess the likely significant effects of the Proposed Development with respect to geotechnical and geo-environmental conditions.

13.1.2 The Proposed Development comprises an outline planning application for up to two hundred and fifty residential dwellings, with associated infrastructure works (including access), car parking and landscaping, alongside demolition of existing buildings, on land at Oakley Farm, Cheltenham.

13.1.3 The assessment considers the key potential effects of the Proposed Development on human health, controlled waters and the land and ecosystem quality (both of site and the wider surrounding area) and should be read in conjunction with Wilson Associates Geo-environmental Desk Study Report Ref: 4360, dated June 2018 and Geotechnical Design Report Ref: 4360/2, dated November 2018 (included as **Appendix 13.1** and **13.2**).

13.2 ASSESSMENT APPROACH

13.2.1 The Chapter describes the methods used to assess the effects and determines the baseline conditions with respect to ground conditions and the possibility of land contamination associated with the previous usage of both the Application Site and its immediate surrounding area. The potentially affected receptors are identified, together with the potential direct and indirect effects arising from the Proposed Development. Mitigation measures are also set out, where required, to prevent, reduce or offset the effects and the residual effects are also described. Further details on the detailed methodology that supports this assessment are provided at **Appendix 13.1.**

13.2.2 This chapter has been written with regards to Scoping Report submitted on 7th May 2019 and the Scoping Opinion issued by Cheltenham Borough Council (CBC) on 12th July 2019. This preliminary contamination assessment is considered necessary in light of the proposed residential development. The assessment presented is this chapter is based on the Proposed Development description and development parameters provided in **Figures 3.1-3.4** of the ES.

Methodology and Assessment of Significance

13.2.3 The criteria for the type of impact is shown in **Table 13.1** below and considers both the area and volume (proportional to the site) that is or is likely to be impacted, and either the negative (adverse), neutral, or positive (beneficial) consequences of such an impact in terms of its effect upon one of more of the following:

- Human Health of on-site workers (development phase), future users and general public in the surrounding area;
- Controlled surface waters and groundwater resources;
- Proposed landscaped areas (including public area), the on-site ecosystem and the ecosystem of the surrounding area;
- Proposed construction including foundations; and
- The natural undisturbed geology (soil and rock).

Table 13.1: Type of Impact

Impact type	Criteria
Adverse	• Possible significant harm to a human • Possible effect on water quality • Possible long-term effect on ecosystem • Possible effect on soil / rock.
Neutral	• No effect
Beneficial Impact	• A positive effect

13.1.1 The type of effects has been considered with regard to its potential to cause significant harm to either human health, controlled waters or the surrounding ecosystem. Effects in both construction and operation (completed development) are considered.

13.2.4 The significance of a potential impact is based on the combination of the sensitivity of the receptor and the magnitude of any given impact, with examples of this approach in provided in **Tables 13.2-13.4** below.

13.2.5 The criteria for the sensitivity of a receptor to any given impact with respect to contaminated land is shown in **Table 13.2.**

Table 13.2: Impact Sensitivity

Site Sensitivity	Criteria
High	• Residential end use • Major aquifer beneath the site or within influencing distance • On-site/off-site surface waters of good to excellent quality • Excellent habitat • Geological sites of National Importance
Moderate	• Allotment end use • Minor aquifer beneath the site or within influencing distance • On-site/off-site surface waters of moderate quality • Geological sites of Regional Importance • Good habitat
Low	• Commercial/Industrial end use • Non-aquifer beneath the site • On-site/off-site surface waters of poor quality • Poor habitat • A site of no geological importance

Table 13.3: Impact Significance

		IMPACT MAGNITUDE	
		Adverse	**Neutral**
Sensitivity	**High**	Significant	Low
	Moderate	Moderate	No Effect
	Low	Low / No Effect	No Effect

Table 13.4: Assessment Criteria

Significant	Issues which have a high potential to represent a cost or liability to the site owner or occupiers.
Moderate	It is possible but not certain that such issues might arise as a cost or liability for the site owner or occupiers.
Low	It is considered unlikely that such issues may represent a cost or liability for the owner or occupiers of the site.
No Effect	There is considered to be no significant risk to the present or future site occupants, nor to the environment.

13.2.6 The following sources of reference were utilised in compiling this chapter:

- Geo-environmental Desk Study Report Ref: 4360 undertaken by Wilson Associates (Consulting) Limited, dated June 2018 (attached in **Appendix 13.1**);
- Geotechnical Design Report Ref: 4360/2 undertaken by Wilson Associates (Consulting) Limited, dated November 2018 (attached in **Appendix 13.2**);
- Envirocheck Report Ref: 65735794_1_1 from the Landmark Information Group, dated 23 March 2015 (refer to **Appendix 13.1**);
- Geological Survey of Great Britain 1:10,000 scale Sheet SO 92 SE, dated 1983;
- Site reconnaissance survey conducted as part of recent site investigations (refer to representative photographs included in WA report 4360 – attached in **Appendix 13.1**); and
- Building Research Establishment (BRE): Radon – 'Guidance on Protective Measures for New Buildings'.
- Agricultural Land Classification and Soil Resources Survey undertaken by Reading Agricultural Consultants dated September 2019.

Legislative and Policy Context

National Planning Policy

13.2.7 The following legislation, policy documents and guidance have been considered and followed within this assessment:

- Environmental Protection Act 1990 – Part IIA
- Environment Agency Contaminated Land Report 11 (CLR11) 'Model Procedures for the Management of Land Contamination'
- National Planning Policy Framework (NPPF) (2019) replacing previous Planning Policy Statement 23 (PPS 23): Planning and Pollution Control - Annex 2: Development on Land Affected by Contamination
- BS10175 'Code of Practice for the Investigation of Potentially Contaminated Sites' (2011)

Local Planning Policy

13.2.8 With regard to Section 38(6) of the Planning & Compulsory Purchase Act 2004, the Development Plan comprises the adopted Gloucester, Cheltenham and Tewkesbury Joint Core Strategy (December 2017), and the saved policies of the Cheltenham Borough Plan (2006). The emerging Cheltenham Borough Plan Pre Submission Version (February 2018) has been submitted for examination and the examination process is ongoing. The review of the Gloucester, Cheltenham and Tewkesbury Joint Core Strategy is currently at the 'Issues and Options' stage[1], with consultation on this having been completed.

Assumptions and Limitations

13.3 BASELINE CONDITIONS

13.3.1 This section comprises an initial site description and places the Application Site in context regarding the potential for the presence of contamination. Using the sources of reference listed in section 13.2.6 the baseline survey information covers the site's history, land use and its environmental setting.

Site Description & Context

13.3.2 As determined from the reconnaissance survey, the site comprises predominantly grass covered fields occupied in the central-northern part by derelict farm buildings. A heavily vegetated incised channel runs broadly southeast to northwest through the site, although no water was observed within. A service box marked with 'water' was observed in the south eastern corner within a field boundary; it is suspected that this is a service/monitoring point for pipework to/from a reservoir located offsite to the east. Of those reservoirs, the northernmost reservoir is empty having been partially infilled with unknown material; whilst the southernmost reservoir is a covered structure which reportedly feeds water by gravity to local residential dwellings.

13.3.3 Topographic mapping data provided by the Google Earth aerial mapping service indicates the site lies on a moderately steep slope falling from c128m above Ordnance Datum (AOD) in the south east to c83m in the northwest.

[1] Gloucester, Cheltenham, Tewkesbury Joint Core Strategy Issues and Options Consultation, October 2018

Geology

13.3.4 Geologically the site is underlain in its entirety by solid strata of the Charmouth Mudstone Formation (CMF). There are no recorded superficial deposits and mapping indicates no apparent geological faulting within influencing distance of the site; there is also no made ground mapped on/within the site. Mapping does however record an extensive area of "landslip" across the western half of the site.

Hydrogeology

13.3.5 The EA classifies the CMF as a 'Secondary Undifferentiated' aquifer, which means that the EA has not been able to characterise the material due to the variable characteristics of the rock type. This Practice's experience of the CMF is that it mostly classifies as a non-aquifer due to negligible permeability. Envirocheck data records no water abstractors within a 1km radius of the site and confirms that the site is not located in a groundwater Source Protection Zone (SPZ).

Hydrology

13.3.6 The closest surface water feature appears to be the southernmost reservoir adjacent east of the site, formerly comprising part of the Cheltenham Water Works but now identified as a 'covered reservoir', operated by Severn Trent Water. The nearest 'open' water feature is the Wyman Brook, c186m north of the site. The site is not located within an area at risk from tidal or fluvial flooding. The site is currently covered by soft landscaping, therefore rainwater infiltration at the site can be expected to be high, subject to natural permeability.

Site History

13.3.7 Historical mapping confirms little significant change to the agricultural land use of the site from the earliest available mapping of 1883 until the present day (with the exception of Oakley farm and associated buildings), although there has been evidence of clay extraction off-site to the immediate west since earliest available mapping; features which were apparently infilled by 1978, which could present a ground gas risk. The adjacent suburb of Harp Hill shows continued residential and commercial/industrial development.

Site Sensitivity

13.3.8 Based upon available 'on-line' information the Application Site does not lie either inside or within potential influencing distance of any environmentally sensitive areas.

Land use

13.3.9 Based upon the available information 'on-line' and services offered by Landmark, the Application Site and its immediate surrounding area has previously contained and does currently contain, or has previously been affected by the following:

- Historical clay pits associated with former brick works identified off-site immediately to west of site boundary. Area of up to circa 4.5 hectares potentially infilled by 1978 with unknown materials which could present a ground gas risk.
- Hewletts Reservoir (No.1) identified off-site immediately to east of site boundary. Area of circa 1.4 hectares potentially infilled by 1978 with unknown materials which could present a ground gas risk.

- Recorded historical landfill identified as 'Recreation Ground at Oakley' covering an area of circa 5.2 hectares located off-site approximately 180m to the north of the site boundary. No records of age, material content or structure (capping, venting measures etc) available. Inspection of this feature during the site walkover confirmed the area to currently comprise a grass covered playing field, with no evidence of gas wells or vent pipes.
- Recorded historical landfill identified as 'Northfield Farm' covering an area of 71 square metres located off-site approximately 242m to the east of the site boundary. Believed to be filled with inert waste only although no records of age, or structure (capping, venting measures etc) available.

Potentially Contaminative Uses

13.3.10 Based upon the review of historical Ordnance Survey mapping the Application Site would appear to have been entirely agricultural usage, with Oakley farm buildings present at its central northern border. Although this suggests "greenfield" status, potential contaminants relating to this land use may have resulted in localised impaction to the subsoil from toxic and phytotoxic metals, hydrocarbon compounds (fuel/oil associated with the farm yard), PAH compounds within ash/charcoal based topsoil/made ground, and pesticide residues from crop spraying.

13.3.11 The site is located within proximity to a single recorded historical landfill site located 180m to the north, as well as a backfilled reservoir to the east and former clay pits to the west, and may therefore be affected by landfill gases migrating from one or more of these sources.

Summary of Ground Conditions Encountered

13.3.12 Based upon information available at the time (preceding Phase 1 surveys), intrusive investigation was undertaken, targeted to reflect the former/existing site usage though also to provide overall site coverage. Intrusive investigation identified a consistent ground profile beneath the site concordant with geological mapping comprising clay/mudstone representing the upper weathered mantle of the Charmouth Mudstone Formation (which appeared locally affected by landslip), overlain by topsoil and subsoil deposits. The topsoil and subsoil horizons represent 'disturbed' deposits resulting from agricultural activity on the site, and made ground was encountered in WS1, WS4 and WS5; however there was no evidence of contamination. No groundwater seepage was recorded during the drilling process, although monitoring wells in boreholes subsequently showed groundwater levels slowly rising over time, likely attributable to the winter wet weather leading to groundwater infiltration by way of minor seepages via fissures in the clay. For a detailed description of ground conditions including borehole logs, reference should be made to WA Geotechnical Design Report, ref: 4360/2.

Summary of Contamination Risk Assessment

13.3.13 A detailed contamination risk assessment including toxic and phytotoxic metals, PAH, pesticide and acidity analysis indicates that the site is locally contaminated with an elevation of arsenic and loose fibre(s) of asbestos (Chrysotile) the latter of which is deemed to pose a risk to the health of future site users, without suitable mitigation in place. There are no significant risk to controlled waters. On the basis of the foregoing there are specific recommendations for remediation and/or supplementary investigation. In the case of the asbestos fibres, supplementary sampling and asbestos quantification should be undertaken to delineate the extent of contamination and to advise on whether any arisings will require disposal at a hazardous landfill site. For a detailed review of laboratory contamination analysis and the ensuing risk assessment, reference should be made to WA Geotechnical Design Report, ref: 4360/2, included in **Appendix 13.1**

13.3.14 A landfill gas risk assessment has been undertaken in general accordance with BS8485:2015 "Code of practise for the design of protective measures for methane and carbon dioxide ground gases for new buildings", and with reference to construction Industry Research and Information Association (CIRIA) 665 'Assessing risks posed by hazardous ground gases to buildings' (2007). For a detailed review of this risk assessment, reference should again be made to WA Geotechnical Design Report, ref: 4360/2, included in **Appendix 13.1.**

13.4 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

13.4.1 This section identifies the likely significant effects upon the receptors that may occur as a result of the Proposed Development during both the construction phase and the operation (completed development) phase; this process takes due consideration of the aforementioned contamination risk assessment results. All potential impacts are considered with regard to their likely magnitude, the sensitivity of each receptor and the significance of that impact without any adopted mitigation measures in place. The possibility of any cumulative effects is also considered.

Table 13.5: Summary of Impacts

Ground Conditions (Contamination)	Description of Impact	Geographical Importance					Impact	Nature	Significance Before Mitigation
Source	**Construction**	**N**	**R**	**S**	**D**	**L**			
Loose fibre(s) of Chrysotile Asbestos contamination in the vicinity of the farm buildings coincident with northern site boundary	Inhalation of airborne fibres (affecting construction workers + general public)					*	Adverse	Short term	Significant
Source	**Operation**	**N**	**R**	**S**	**D**	**L**			
Loose fibre(s) of Chrysotile Asbestos contamination in the vicinity of the farm buildings coincident with northern site boundary	Inhalation of airborne fibres (affecting construction workers + general public)					*	Adverse	Long term	Significant

KEY:

Geographical Level of Importance	Impact	Nature of Impact	Significance
N = National	Adverse	Long term	Significant
R = Regional	Neutral	Short term	Moderate
S = Sub-Regional	Beneficial		Low
D = District			No Effect
L = Local			

13.5 MITIGATION

Construction

13.5.1 Contamination risk assessment (refer to Table 13.5 and WA Report ref: 4360/2 in **Appendix 13.2**) shows the site to be locally contaminated with loose fibres of Chrysotile asbestos and there is a perceived risk to human health but no significant risk to controlled waters, therefore there is a specific requirement for remediation prior to construction.

13.5.2 It is recommended that the asbestos is removed from site to protect groundworkers and all such material will need to be disposed of off-site at a suitably licensed landfill. It is recommended that some further investigation is undertaken (once all existing buildings have been demolished) to delineate the affected area and determine the volume of made ground requiring off-site disposal. Works will also need to clarify whether the subsequent waste stream classifies as hazardous. Note that if only isolated fragments are found rather than free fibres within the soil, then a simplified 'manual pick' strategy may be sufficient to remove the risk. The submission of a formal remedial strategy may be requested by the relevant authority detailing the method and timescales of such works. Immediately following the remedial works, it will be necessary to undertake validation sampling on the exposed formation to ensure that all contaminated material has been adequately removed with a final verification report produced, again to satisfy the relevant authority. Replacement soil will need to be uncontaminated and suitable for a residential development and ideally come with pre-certification confirming its suitability.

13.5.3 Notwithstanding the above site personnel should always adopt good working practices in line with CDM Regulations 2015. It is also recommended that any temporary fuel storage tanks brought onto the site by construction contractors are suitably bunded to prevent leakages, whilst any spillages from tanks and/or mechanical plant should be cleared up immediately. As always it is further recommended that a careful watch be maintained for any abnormalities encountered during site strip etc, which might require referral back to this Practice.

Completed Development

13.5.4 As noted above contamination risk analysis indicates a specific requirement for the undertaking of remedial measures to address risk to human health in light of the proposed residential development.

13.6 RESIDUAL IMPACTS

Construction

13.6.1 Based upon the foregoing, and assuming any other required mitigation strategies are complied with all potential impacts are considered to be insignificant i.e. 'No Effect'. There are not considered to be any residual adverse impacts.

Completed Development

13.6.2 There are not considered to be any residual adverse impacts.

Table 13.6: Summary of Residual Impacts

Ground Conditions (Contamination)	Description of Impact	Geographical Importance					Impact	Nature	Significance After Mitigation
Source									
Loose fibre(s) of Chrysotile Asbestos contamination in the vicinity of the farm buildings coincident with northern site boundary	**Construction**	**N**	**R**	**S**	**D**	**L**	Neutral	Short term	No effect
Loose fibre(s) of Chrysotile Asbestos contamination in the vicinity of the farm buildings coincident with northern site boundary	**Operation**	**N**	**R**	**S**	**D**	**L**	Neutral	Long term	No effect

KEY:

Geographical Level of Importance	Impact	Nature of Impact	Significance
N =National	Adverse	Long Term	Significant
R = Regional	Neutral	Short Term	Moderate
S = Sub-Regional	Beneficial		Low
D = District			No Effect
L = Local			

13.7 CUMULATIVE IMPACTS

Construction

13.7.1 Within the context of this chapter regarding contaminated land, there are not considered to be any cumulative effects upon any receptors, collectively with other proposed off-site developments in and surrounding Oakley Farm.

Completed Development

13.7.2 Within the context of the chapter regarding contaminated land, there are not considered to be any cumulative effects upon any receptors, collectively with other proposed off-site developments in and surrounding Oakley Farm.

13.7.3 Notwithstanding the above it is recognised that there are proposals to develop land within the wider Oakley and Battledown districts to the north and south respectively to comprise residential developments. The foregoing developments are unlikely to have any direct impact upon the ground conditions and contamination status of the Site or identified receptors, thus there are not considered to be any cumulative effects.

13.8 SUMMARY AND CONCLUSIONS

13.8.1 This chapter of the ES considers the likely significant effects of the Proposed Development on human health, controlled waters and the land and ecosystem quality (both on site and the wider surrounding area) for the Application Site.

13.8.2 Baseline conditions for this chapter were determined through desk study research supplemented with the results of intrusive ground investigation.

13.8.3 Various environmental issues have been considered and assessed in terms of their likely impact upon human health, controlled waters and the surrounding ecosystem. The risks have been assessed by consideration of the "source-pathway-receptor" concept, the behaviour of potential contaminants within the environment, current and foreseeable legislation, and the views of and good practices expected by the environmental regulators.

13.8.4 A single potential impact and risk to human health has been identified relating to both construction (development) and operational (completed development) phases. There are not considered to be any cumulative effects relating to contaminated land arising from the Proposed Development and other known cumulative sites in the vicinity.

13.8.5 Pre-mitigation effects have been assessed and the type and description of an appropriate mitigation strategy outlined, again relating to the construction and operation phases of the development. On the basis that the required mitigation strategy is complied with, all potential impacts are considered to be 'insignificant'. There are not considered to be any residual impacts.

14 SUMMARY

14.1.1 This chapter of the ES provides a summary of the various technical assessments which have been undertaken as part of the EIA process.

14.2 SOCIO-ECONOMICS

Baseline Conditions

14.2.1 The Site is situated to the north east of Cheltenham town centre. The Site is bounded to the south by Harp Hill Road and to the west by Wessex Drive both of which are established residential areas. The Site is situated within the Battledown Ward.

14.2.2 Cheltenham is expected to experience population growth. It is expected to see a stronger growth in the ageing population than it is noted nationally, couple with a notable decrease in working age population.

14.2.3 The area that is subject to the outline planning application is currently a greenfield site. It is assumed that the Proposed Development will provide a housing to accommodate future population growth as well as stimulate local economic activity.

14.2.4 The Borough is planned to accommodate housing development during the plan period. The Proposed Development is expected to provide a part of this supply.

14.2.5 There is currently sufficient educational and medical capacity serve to the existing community. Upon delivering the Proposed Development, it is likely that the area will be able to accommodate the population growth arising from the proposal. The analysis contained in this chapter indicates that there is a capacity across both primary and secondary schools in the statutory distance from the Site and also a healthy capacity of GPs in a close vicinity.

Likely Significant Effects

14.2.6 The key socio-economic effects of the Proposed Development can be summarised as follows:

- Provision of 250 residential units, demolition of existing buildings, vehicular access from Harp Hill and open space and landscaping
- Provision of approximately 91 additional jobs, with additional 64 indirect jobs and 36 induced jobs during the construction phase in the construction sector;
- Accommodation for a population of circa 568 people, of which 199 are estimated to be new to the area;
- A positive effect on the age of the population;
- New houses and services within the area to address the existing deprivation;
- Provision of planned housing (including affordable housing) of a range of types, sizes and tenures to meet local and district-wide housing needs;
- A £7.8M of gross income, of which £2.7M is likely to be new to the area, which will support local services;
- An increase in the local economy;
- An overall provision of 8.8 ha of green space.

Mitigation and Enhancement

14.2.7 No mitigation has been identified in socio-economic terms given that the Proposed Development provides beneficial effects.

Conclusion

14.2.8 Overall the Proposed Development is considered to provide beneficial effects and will contribute to the housing and employment needs of the district.

14.3 LANDSCAPE AND VISUAL

Baseline Conditions

14.3.1 The study site consists of a north sloping area of former agricultural land on the existing settlement edge of Cheltenham. The land is bordered by settlement to its northern, southern, western and part eastern boundaries. Hewlett's Reservoir also forms part of the Site boundary to the east. Although generally contained by settlement features the land falls within the Cotswolds AONB.

14.3.2 There is no public access to the land although a Public Right of Way is located along the entire western site boundary linking Harp Hill to Priors Road.

14.3.3 Site features consist of sloping former pasture, derelict former farmstead, established hedgerows, hedges and a number of mature trees protected by Tree Preservation Orders. The sloping topography is also a distinctive feature of the study site which forms part of the northern lower slope to Battledown Hill.

14.3.4 The study site lies within National Character Area 106 Severn and Avon Vales and within the sub area Cooper's Hill to Winchcombe Landscape Character Area (2D) of the Escarpment Landscape Character Type (2) as identified in the Cotswolds AONB Landscape Character Assessment. The Landscape Character, Sensitivity and Capacity Assessment of Cotswolds AONB within Cheltenham Borough Administration Area prepared for Cheltenham Borough Council includes an assessment of the study site under LCA7.1 of the appraisal. This identifies the study site as falling within the Oakley Farm Pasture Slopes within the 'Pasture Slopes' Landscape Character Type. The appraisal identifies that the site consists of a small to medium scale landscape with sloping topography within pastoral farmland land use contained by mature hedgerow boundaries. The appraisal also identifies the influence of human activity through residential built development to the north, west and south. Since the appraisal was completed (May 2016) residential development has now extends to part of the eastern site boundary.

14.3.5 Site features are in mixed condition with medium to good quality trees and mixed quality hedgerows.

Likely Significant Effects, Mitigation and Enhancement

14.3.6 The landscape value is acknowledged to be high due to the AONB designation. The escarpment landscape character area is predominately rural but in the location of the study site is influenced by the settled landscape of the wider Cheltenham area. As built form and settlement features are a prominent component in the landscape the susceptibility to change is assessed to be slightly reduced from areas where the escarpment remains adjoined with a rural vale landscape. As such this assessment identifies that landscape sensitivity is Medium High when considering medium susceptibility with a high landscape value.

14.3.7 The sloping nature of the study site influences visual prominence with lower slope areas adjoining Oakley Grange having lower visual prominence than the more elevated areas closer to Harp Hill. On the southern site boundary with Harp Hill the site affords extensive and panoramic views to the north and north east but at lower slopes areas these views are lost due to a combination of topography and established

landcover. This has an influence on visual sensitivity of the site with elevated areas being visually prominent particularly from escarpment viewpoints so having a high visual sensitivity. Lower slope areas are not visually prominent and are generally obscured in views into the site from the north and north east areas of the escarpment. As such the lower slope areas are assessed to have a lower visual sensitivity. This variation in potential visual and landscape sensitivity has been used to inform the development parameter plans so that development proposals are proposed within lower sensitivity areas of the study site, allowing higher sensitivity areas to be conserved to protect landscape character and visual amenity generally.

14.3.8 Inherent mitigation measures include the retention and restoration of boundary hedgerows and site trees which in conjunction with the sloping topography create containment of the development and limit views of development features in views from the escarpment. Additional mitigation including a belt of new tree planting across the study site (east to west) is intended to create a robust edge to the development area, maintaining separation with a significant area of retained grassland. This retained grassland is intended to conserve the open and rural character of the study site on its higher slope adjoining Harp Hill. The retention of this open grassland conserves quality of views across the site from Harp Hill and the landscape characteristic of the green wedge of land which includes the reservoir site, seen in long distance views of the study site from the north and north east.

14.3.9 When combined, landscape effects are assessed to be Minor Adverse at year 1 with Moderate adverse effects recorded to the Oakley Pasture Slopes LCA and the sloping pasture of the site. This is due to the physical loss of the pasture to development. On establishment of additional mitigation measures landscape effects remain Minor Adverse with a reduction to Minor Adverse to the Oakley Pasture Slopes LCA due to the restoration of the retained grassland, new public access and establishment of new green infrastructure.

14.3.10 Visual effects when combined are assessed to be Moderate Adverse at year 1 with a Major Adverse assessed for walkers using the public right of way immediately adjoining the western boundary of the study site. With established mitigation measures visual effects reduce to Minor Adverse for visual receptors experiencing long distance views into the site from elevated locations on the Cotswold escarpment, short distance views from harp Hill, Wessex Drive and Priors Road. Moderate Adverse effects remain recorded for short distance views from immediately adjoining dwellings at Oakley Grange as loss of openness cannot be mitigated.

14.3.11 Construction effects on both landscape and visual receptors are assessed to be Moderate Adverse due to visual prominence of temporary features and activities but landscape effects will be contained to the study site.

14.3.12 Cumulative effects are assessed to be less than significant on the wider rural landscape of the AONB due to the influence of the existing Oakley Grange development which has now generally enclosed the study site, creating separation with the wider escarpment landscape and the Cotswolds AONB generally. Other approved or allocated development sites are sufficiently disconnected both visually and in landscape character terms that they will not lead to cumulative landscape or visual effects. There is a cumulative effect of development with the Oakley Grange residential area which results in a consolidation of development at Oakley but this is assessed to strengthen the developing pattern of settlement in this location.

Conclusion

14.3.13 The overall landscape and visual effects of the development proposals will result in the loss of sloping pasture which makes a contribution to local landscape character

and visual amenity. The harm arising has been assessed and found to be limited by the extent to which the study area is already influenced by settlement features, inherent mitigation through retained vegetation and natural topography and the separation of the study site from the wider escarpment landscape and wider AONB. Potential impacts are predicted to have greater landscape and visual effects on the immediate urban landscape which falls outside of the AONB than on the wider rural landscape within the AONB with exception of the study site itself. The study site contributes to the character and visual amenity of the AONB and to the setting of Cheltenham but not all areas of the study site make the same contribution. The development proposals retain the features which make the greatest contribution and have the highest sensitivity, limiting potential adverse impacts. This confirms that the study site has capacity to accommodate development whilst conserving the wider landscape character and scenic beauty of the AONB in keeping with intentions of both national and local landscape policy.

14.4 BIODIVERSITY

Baseline Conditions

14.4.1 The Application Site is situated on the eastern side of Cheltenham, Gloucestershire. The western boundary is bordered by a public footpath with existing residential development beyond. Residential development also lies to the north and south (beyond Harp Hill). New residential development is currently in construction to the north-east and a covered reservoir is located to the east with open countryside beyond.

14.4.2 The Application Site itself consists of six semi-improved grassland fields separated by hedgerows and trees. There are six buildings in the north of the Application Site, with associated amenity planning, neutral grassland, hedgerows and trees.

Statutory Designated Sites

14.4.3 There are no statutory designated sites of nature conservation interest within or immediately adjacent to the Application Site. The nearest statutory designation is Cleeve Common Site of Special Scientific Interest (SSSI) that lies approximately 2.7km north-east of the Application Site and is separated by residential development and extensive areas of open countryside and agricultural land.

14.4.4 The nearest European designation is Dixton Wood Special Area of Conservation (SAC), also notified as a SSSI, that lies around 8.6km to the north of the Application Site and is separated by minor and major roads, residential development and extensive areas of open countryside and agricultural land.

14.4.5 In addition, there are three other SSSI's (Puckham Woods, Lineover Wood and Leckhampton Hill and Charlton Kings Common SSSI) located within 5km of the Application Site and one other SAC (Cotswold Beechwoods SAC), which is also designated as a National Nature Reserve (NNR) and a SSSI, within 9km of the Application Site.

Non-statutory Designated Sites

14.4.6 There are no non-statutory designated sites of nature conservation interest within or immediately adjacent to the Application Site. The nearest non-statutory site is Glenfall Wood Key Wildlife Site (KWS) located approximately 0.8km southeast of the Application Site, and is separated from the Application Site by roads and agricultural land.

Habitats

14.4.7 The vast majority of the Application Site comprises semi-improved grassland fields (F2-F7), separated by a network of hedgerows and trees. Other habitats within the Application Site include areas of amenity grassland (F1) and planting, a dry depression, areas of ruderal vegetation and ruderal-dominated grassland, as well as areas of scattered scrub, Bramble scrub, cleared Bramble scrub and cleared ground. In addition, there are six buildings (B2-B7) in the north of the Application Site with areas of hardstanding associated with these buildings. Building B1 was subsequently demolished in October 2019 under planning consent 19/01610/DEMCON, after evening bat emergence and dawn bat re-entry surveys undertaken in June, July and September 2019 confirmed no bat roosts were present.

14.4.8 The majority of the habitats are considered to be of low ecological value. Habitats of greater ecological value in the context of the Application Site include areas of greater botanical interest within two grassland fields (F2 and F3) as well as hedgerows and trees.

Fauna

14.4.9 General observations were made throughout Ecology Solutions' surveys of any faunal use of the Application Site with attention paid to the potential presence of protected species. Specific surveys were also undertaken with regard to Badgers, bats, breeding birds and reptiles.

14.4.10 During the surveys undertaken, no evidence of Badgers and reptiles was recorded within the Application Site, although it is considered the habitats present offer some suitable opportunities for foraging Badgers.

14.4.11 Overall, the vast majority of bat activity was recorded from Common Pipistrelle, with less activity recorded from *Myotis* sp., Lesser Horseshoe bats, Soprano Pipistrelle, *Nyctalus* sp., Brown Long-eared, Nathusius' Pipistrelle and Barbastelle. Only occasional and low levels of activity was recorded from Serotine. In addition, there is one mature Oak tree with an occasionally used summer day roost used by a single Noctule bat in the north of the Application Site.

14.4.12 In general, bats use most of the hedgerows within the Application Site to varying degrees throughout the year with areas of greater registrations at the crossing point of H3 and H1 along hedgerows and trees associated with the demolished farm building B1, along H7-H11, along the northern section of H9 (just before crossing point of H9 and H12), at the crossing point of H2 and H2a. Lower numbers of bat registrations were recorded along H1, H2a, H5, H6 and along the northwestern (H2a and H3), northeastern and eastern boundary of the Application Site.

14.4.13 It is considered that the Application Site supports an unremarkable ornithological assemblage, with low numbers of notable breeding bird species, including House Sparrow, Willow Tit, Dunnock and Bullfinch.

Likely Significant Effects

Statutory Designated Sites

14.4.14 The nearest statutory designated site is Cleeve Common SSSI (located approximately 2.7km north-east of the Application Site), which is well separated from the Application Site. The Impact Risk Zones (IRZ) from the Cleeve Common SSSI partially cover the Application Site and have identified the potential effects on this SSSI from Proposed Development to be from 'any residential developments with a total net gain in residential units'.

14.4.15 The nearest European designation is Dixton Wood SAC/SSSI, which is well separated from the Application site and none of its IRZs extend into the Application Site. Puckham Woods SSSI, Lineover Wood SSSI and Leckhampton Hill and Charlton Kings Common SSSI are all well separated from the application Site and none of their IRZ's extend into the Application Site. As such, it is considered there would be no likely significant effects, either alone or in combination with other plans or projects, during either the construction or operational phases.

14.4.16 The Cotswold Beechwoods SAC/NNR/SSSI is well separated from the Application Site, however it's IRZ's cover the Application Site and have identified the potential effects on this SSSI from Proposed Development to be from 'any residential developments with a total net gain in residential units'. A Briefing Note has been produced to provide information required for a Habitat Regulation Assessment (HRA) for the Cotswold Beechwoods SAC. As concluded within this Briefing Note, it is considered that there would be no significant direct / indirect effects from the Proposed Development alone or in combination with other developments on the Cotswold Beechwoods SAC.

14.4.17 Given the presence of alternative recreation resources, the same principles apply for the Cleeve Common SSSI as set out in the HRA for the Cotswold Beechwoods SAC. Therefore, it is considered that there would be no significant direct / indirect effects on the Cleeve Common SSSI.

Non-statutory Designated Sites

14.4.18 It is considered there would be no likely significant effects on the Glenfall Wood KWS, either alone or in combination with other plans or projects, during either the construction or operational phases.

Habitats

14.4.19 The Development Proposals will result in the loss / partial loss or change of use of the habitats present within the Application Site during the construction phase, while no additional adverse effects are considered to be relevant during the operational phase on the majority of the retained habitats.

14.4.20 Although there is likely to be recreational pressure on the retained semi-improved grassland at the operational phase, it is not considered that there will be any significant adverse effects.

Fauna

14.4.21 Effects during the construction phase are considered to be short-term disturbance to foraging and commuting Badgers, and potential disturbance from construction traffic; a reduction in suitable foraging and navigational opportunities for

bats, although the vast majority of the hedgerows and trees will be retained within the Proposed Development, and potential disturbance from lighting on foraging and commuting bats during the construction phase; and loss of some foraging and nesting habitat for birds to the Proposed Development, and potential for killing or injury of birds and / or damage or destruction of nests during clearance of vegetation.

14.4.22 During the operational phase, it is not considered there will be any significant adverse effects on fauna, other than potential disturbance from lighting to foraging and commuting bats.

Mitigation and Enhancements

Statutory Designated Sites

14.4.23 Although no mitigation is deemed to be required Homeowner Information Packs (HIPs) will be included as part of the proposed development.

Non-statutory Designated Sites

14.4.24 None relevant.

Habitats

14.4.25 New areas of species-rich grassland will be sown / oversown using a native species-rich grassland seed mixture (such as Emorsgate's Flowering Lawn Mixture EL1 or Standard General Purpose Meadow Mixture EM2) and be subject to a suitable management regime to increase the floristic diversity of the Application Site, which will compensate for the loss of small areas of amenity grassland. The planting of new native shrubs throughout the Proposed Development will also compensate for the loss of small patches of amenity planting.In order to compensate for the loss of the areas of semi-improved grassland, including the small areas with greater botanical interest, the retained grassland in the north of the Application Site will be oversown with a species-rich native seed mixture (such as Emorsgate's EM2 Standard General Purpose Meadow Mixture). In addition, as an enhancement new grassland will be created around the new SUDS feature and sown / oversown using a native species-rich grassland seed mixture (such as Emorsgate's Standard General Purpose Meadow Mixture EM2).

14.4.26 Retained and newly created areas of species-rich grassland will be subject to a suitable management regime to increase its floristic diversity. This could be secured by way of a planning condition requiring a Landscape and Ecological Management Plan (LEMP).

14.4.27 Measures will be put in place to ensure that retained hedgerows and trees and sections of hedgerows are safeguarded from direct effects during the construction phase, e.g. fenced-off during construction to prevent encroachment into these areas by construction machinery. No construction machinery or materials will be stored within these fenced areas at any point during the development. This could be secured by way of planning condition requiring the production of a Construction Environmental Management Plan (CEMP).

14.4.28 The creation of new areas of landscape planting within the Application Site, will be planted using a diverse mix of native species wherever possible, or species of benefit to wildlife, which will compensate for the loss of areas of scattered scrub, Bramble scrub, ruderal vegetation and ruderal-dominated grassland.

14.4.29 As an enhancement new hedgerow / tree planting of a length / area greater than that lost is to be included within the Proposed Development. The new planting will be based around native species of local provenance.

Fauna

14.4.30 Green links will be provided throughout the Application Site in the form of retained and new native hedgerows and features akin to a woodland ride within new block planting and along green corridors.

14.4.31 The creation of new species-rich grassland and planting of new native shrubs and hedgerows will provide enhanced foraging opportunities for Badgers. The planting of new native hedgerows and trees, and the creation of features akin to a woodland ride, as well as the creation of a species-rich grassland within the areas of open space will mitigate for the loss of areas of bat foraging habitat.

14.4.32 Where lighting is necessary during construction and operation, any potential light spillage will be reduced, as set out below, and directed away from features that offer suitable foraging opportunities for bats. A sympathetic lighting regime will also be incorporated into the Proposed Development to minimise light spillage into key areas, such as the features akin to a woodland ride within new block planting, retained and new hedgerows / trees and areas of species-rich grassland, to maintain foraging and navigation opportunities in these areas.

14.4.33 The Oak tree (T1) with an occasionally used summer day roost for Noctule bat and the other trees with potential to support roosting bats will be buffered from the Proposed Development and retained in dark corridors (as part of any detailed lighting scheme) to allow continued movement by bats through the Application Site.

14.4.34 In order to safeguard any nesting bird species within the Application Site, the clearance of any hedgerows, trees and scrub will be undertaken outside of the bird breeding season (March-July inclusive). Should this not be possible potential nesting habitat is subject to a check survey immediately prior to its removal by an experienced ecologist. Should any nesting birds be identified then the nest should be fully safeguarded in situ and subject to a disturbance buffer of at least 5 metres and only removed once it has been confirmed any fledglings have left the nest.

14.4.35 The provision of new native hedgerow and tree planting will mitigate for the loss of small areas of bird nesting habitat, while the creation of species-rich grassland in the north of the Application Site will mitigate for the loss of foraging habitat and provide enhanced foraging opportunities over the existing situation.

14.4.36 The new SUDS feature will diversify existing habitats within the Application Site by creating a habitat type that does not currently exist (other than the one 'dry' depression which is also to be retained). The planting of native species of benefit to wildlife, such as fruit-bearing trees, will be an enhancement and will provide additional seasonal foraging opportunities for Badgers and birds.

14.4.37 As an enhancement, bat boxes are to be erected on retained semi-mature / mature trees or new buildings to provide new roosting opportunities for bats. Also, the new SUDS feature will diversify habitats present and provide enhanced foraging opportunities for bats, including Common Pipistrelle, Soprano Pipistrelle Nathusius' Pipistrelle, *Nyctalus* sp. and Serotine.

14.4.38 As an enhancement, nest boxes for birds will be placed on suitable retained / new trees and /or buildings. These will provide further nesting opportunities and will be of particular value whilst the new areas of landscape planting mature. Using nest boxes

of varying designs would maximise the species complement attracted to the Application Site, and where possible these could be tailored to provide opportunities for Red Listed / Priority Species e.g. House Sparrow, known to be present within the Application Site and wider area.

14.4.39 A series of log piles and hibernacula will be included within the areas of open space, associated with the attenuation features and areas of rough grassland, which will provide suitable hibernation / refuge opportunities for invertebrates.

Conclusion

14.4.40 With the mitigation proposed, the Proposed Development would not result in any adverse residual effect on habitats of species of any significance, and there will be no net loss of features of ecological importance.

14.4.41 Where it is considered that there is a reduction in potential habitat for protected species, the development proposals will ensure that these are compensated for by replacement habitat of equal size and greater quality.

14.4.42 Following mitigation and enhancement measures, overall effects are considered to be positive at the site to European level and will ensure no net loss in biodiversity terms.

14.5 CULTURAL HERITAGE

14.5.1 The Cultural Heritage Assessment considered both above and below-ground heritage resources which would be affected by the Proposed Development and has assessed the significance of the effects that the Proposed Development would have on them.

Baseline Conditions

14.5.2 The Baseline Survey identified six built heritage resources that might be affected by the Construction and Operational phases of Proposed Development. These built heritage assets are:

- No 1 Reservoir (Grade II listed, HB1)
- No 2 Reservoir (Grade II listed, HB2)
- Pavilion at Hewlett's Reservoir (Grade II listed, HB3)
- Gates, Gatepiers and Boundary Walls at Hewlett's Reservoir (Grade II listed, HB4)
- Stone Lodge at Hewlett's Reservoir (Non-designated Heritage Asset, HB5)
- Agricultural Buildings at Oakley Farm (Non-designated Heritage Asset, HB6)

14.5.3 The archaeological assets considered were:

- Battledown Camp (Scheduled Monument, ARCH1)
- A single probable Prehistoric feature (Non-designated asset, ARCH2)
- Three small pits, undated (Non-designated asset, ARCH3)
- Ditch, probably Post-Medieval (Non-designated asset, ARCH4)
- Shallow linear feature, probably a furrow (Non-designated asset, ARCH5)

Likely Significant Effects

14.5.4 There will be a change to the setting of the identified built heritage resources at the Construction Phase. For the listed buildings this will give rise to an effect which

will not be significant, as the interest of these assets is derived principally from them being feats of architecture and engineering in the nineteenth century, and from their group value. The effects will all be temporary in nature at the Construction Phase. The effect to the Stone Lodge at Hewlett's Reservoir will not be significant.

14.5.5 The total demolition of the Agricultural Buildings at Oakley Farm during the Construction Phase will affect the assets, however due to the low value of these buildings this will not be significant.

14.5.6 During the Operational Phase the setting of the identified listed buildings will be permanently altered, with the erosion of the rural setting causing an effect to the listed buildings. However, given that the buildings principally derive their value from their architecture and engineering, in addition to their group value, this will not cause a significant effect. As with the Construction Phase of development, the effect to the non-designated Stone Lodge at Hewlett's Reservoir will not be significant. The Operation Phase of the Proposed Development will not cause any further effects to the Agricultural Buildings at Oakley Farm as their loss will be during the Construction Phase.

14.5.7 The setting of the Battledown Camp Scheduled Monument will be affected to a very minor extent during the Construction Phase and will also be affected during the Operational Phase. The extent of this change will, however, be negligible in terms of affecting the significance of the monument.

14.5.8 All effects on the buried archaeological assets will take place during the Construction Phase. Any archaeological assets are likely to be destroyed by the construction process, but the assets are considered to be of low to negligible sensitivity on account of their state of preservation, lack of dating evidence, and lack of interpretation. This will result in a Negligible effect on the known buried archaeological assets.

Mitigation and Enhancement

14.5.9 Mitigation has already been designed into the Proposed Development, with there being a buffer of open space proposed between the listed buildings and the edge of built development. This has already been considered in relation to the effects on the asset.

14.5.10 In addition, a programme of building recording for the Agricultural Buildings at Oakley Farm would record their importance and would help to reduce the effects. This could be secured by an appropriately worded condition.

14.5.11 The low level of effect on the Battledown Camp Scheduled Monument indicates that no mitigation is required.

14.5.12 The very limited buried archaeological resource identified within the Application Site, and its identified low significance, indicates that further mitigation is not required.

Conclusion

14.5.13 Whilst the Proposed Development will have some effect on built heritage assets, this will not result in any significant effects, as in the case of the assets at Hewlett's Reservoir the assets derive their value principally from their architecture rather than their setting. This should not prevent the application being granted. In relation to the total loss of the buildings at Oakley Farm, these assets are of very low value and therefore their loss will not cause a significant effect and should not preclude the Proposed Development of the Application Site.

14.5.14 The proposed development will have a very limited effect on the archaeological resource. The development will make a very limited change to the setting of the Battledown Camp Scheduled Monument, which is already compromised by surrounding built form. As a result, it is considered that the proposed development would have a Negligible effect on the monument. Regarding the buried archaeological resource, this has been identified as being of low value, and although the development will have a Major impact on these assets, the result will be of a negligible effect, and should not preclude the Proposed Development of the Application Site.

14.6 TRANSPORT AND ACCESS

14.6.1 The likely significant effects of the Proposed Development in terms of transport and access have been considered. The proposed development will give rise to increased travel demand once occupied. It will also generate construction related traffic during the construction period.

Baseline Conditions

14.6.2 The Application Site comprises an area of approximately 14.9 hectares of land at Oakley Farm, Cheltenham, and it is located north of Harp Hill, approximately 3km east of Cheltenham town centre. It is bounded by Harp Hill to the south, existing residential development to the west and north, and further residential development and Hewlett's Reservoir site to the east. Cheltenham Footpath 86, a Public Right of Way, routes along the western boundary connecting Harp Hill with the B4075 Priors Road, via the existing farm access. The farm access extends eastwards from the B4075 Priors Road along the northern extent of the site.

14.6.3 Collision data have been obtained from GCC for the roads in the vicinity of the Application Site. The collision data covers the 5-year period from 1 January 2014 to 31 December 2018. There were no collisions recorded within the EIA transport assessment study area over the five year assessment period, which includes Harp Hill, the B4075 Priors Road in the vicinity of the site, and the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road Double Mini Roundabout. Overall it is considered that the collision records do not point to any existing highway safety issues which require more detailed examination as part of the assessment.

14.6.4 The nearest bus stops to the Application Site are located in the existing built up area to the north west of the Application Site in the vicinity of Sainsbury's on Priors Road and in the vicinity of the Community Centre on Whaddon Road. Bus routes Q and P provide a regular circular town route, via the town centre, and both operate on a 120 minute frequency. Bus route A offers a more frequent service, which also serves Cheltenham town centre, but also provides longer distance travel options to destinations including GCHQ, a key employment site. The service operates at a frequency of approximately every 12 minutes during the week and every 15 – 20 minutes at weekends.

14.6.5 Cheltenham Spa Railway Station is located approximately 4.6km from the centre of the Application Site. Cheltenham Spa has excellent rail links to destinations across the country, including hourly services to destinations including Cardiff Central, London Paddington, Birmingham and Nottingham, as well as to Bristol Temple Meads and Manchester Piccadilly. Services to Gloucester operate at a typical frequency of 2-4 services per hour.

Likely Significant Effects

14.6.6 Construction activities will include the building of the residential dwellings plus the civil engineering works associated with the construction of the new infrastructure,

including the new site access junction and internal development roads, cycling and walking links, drainage attenuation features, and landscaping. It is estimated that on a typical day there may be in the order of 7 HGV trips per day, equating to on average 14 two-way HGV vehicle movements per day. This is equivalent to less than 2 HGV movements per hour. The effects of construction traffic, particularly HGVs, could be perceived by other road users to be **Minor Adverse**; however the construction period is only temporary and expected to be medium term in its effect.

14.6.7 The effect of the proposed development in 2024 with 250 dwellings occupied has been assessed since this gives the worst case for the effect on the local road network and thus represents a robust assessment.

14.6.8 The maximum effect in terms of percentage change in modelled link flows with the Proposed Development occurs on Harp Hill to the south of the Application Site. To the west of the new site access junction, Harp Hill is predicted to experience an 18.9% increase in traffic in the AM peak and a 20.9% increase in the PM peak, which equates to a **Low** Magnitude of Change. Further afield the predicted increase in traffic on highway links is well below 10%. Other than Harp Hill, no highway links meet the criteria for assessment set out in the Assessment Approach section above.

14.6.9 This level of increase in traffic is expected to have a **Minor to Moderate Adverse** effect on pedestrian movements (Severance, Pedestrian Delay, Pedestrian Amenity, and Fear and Intimidation), and a **Negligible** effect on Accidents and Safety, without mitigation.

14.6.10 In order to determine the effect of the Proposed Development in respect of Driver Delay, junction capacity analysis has been undertaken for the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road Double Mini Roundabout. It is highlighted that although Harp Hill is predicted to experience an increase in traffic flow of greater than 10%, the junction overall is likely to experience an increase in traffic flows in the order of 4.8% - 4.9% during the peak hours. Without mitigation, the effect on this junction would be **Major Adverse** in the AM peak hour and **Minor to Moderate Adverse** in the PM peak hour.

Mitigation and Enhancement

14.6.11 Mitigation measures will be implemented during construction in the form of controls imposed by planning conditions, health and safety legislation requirements and good construction site practices. As part of a Construction Management Plan or similar, a construction vehicle routeing regime for access to the construction site will be identified and agreed with the local highway authority to ensure that drivers of construction related vehicles do not use inappropriate routes.

14.6.12 The new site access junction on Harp Hill and the potential emergency access on the B4075 Priors Road will be designed in accordance with current standards and guidance to ensure that it is safe and suitable.

14.6.13 The internal site layout will be designed in a manner which facilitates walking and cycling, providing links to existing routes to allow good access for sustainable modes of transport. A shared pedestrian / cycleway link is proposed between the Proposed Development and Priors Road along the route of the existing farm access. Further pedestrian linkages are proposed to Harp Hill with cycle linkages to Harp Hill proposed via the new site access junction.

14.6.14 An Interim Residential Travel Plan has been prepared to encourage travel by sustainable modes.

14.6.15 The proposed mitigation / enhancement includes a financial contribution towards the introduction of an uncontrolled pedestrian crossing facility on Harp Hill and a controlled Toucan crossing facility and a new section of shared footway/cycleway on Priors Road. It is considered that these proposed measures would result in a **Minor – Moderate Beneficial** and **Moderate – Major Beneficial** effect, respectively, in terms of pedestrian and cycle movements on Harp Hill and Priors Road.

14.6.16 If required, a proportionate contribution will be made towards enhancement to bus services in the area.

14.6.17 With mitigation, the Magnitude of Change on the Harp Hill approach to the B4075 Priors Road / Hales Road / Harp Hill / Hewlett Road Double Mini Roundabout reduces from **High** to **Negligible** in the AM peak hour and remains **Low** in the PM peak hour. The effect on this junction with mitigation would be **Negligible** in the AM peak hour and **Minor to Moderate Beneficial** in the PM peak hour.

Conclusion

14.6.1 It is concluded that with the implementation of the mitigation and enhancement measures outlined, including the Interim Residential Travel Plan aimed at encouraging travel by sustainable modes, the additional traffic demand would be safely and satisfactorily accommodated on the local transport network.

14.6.2 The overall residual effect of the Proposed Development in transport terms is likely to be generally **Minor to Moderate Beneficial**.

14.7 AIR QUALITY

14.7.1 Consideration was given to the potential air quality impacts associated with demolition of the existing buildings and subsequent construction of the Proposed Development, and impacts that operation of the Proposed Development would have on local air quality. Operational impacts that were considered included road traffic generated by the Proposed Development.

Baseline Conditions

14.7.2 Baseline air quality conditions in the study area were determined based on the local authority's monitoring data and other publicly available data. The Application Site lies within the borough-wide AQMA declared by CBC for exceedances of the annual mean nitrogen dioxide objective. Monitoring undertaken by the Council shows that concentrations of nitrogen dioxide within the study area have been below the objective in recent years.

Likely Significant Effects

14.7.3 Construction activities were shown to be associated with a High risk of dust impacts, without mitigation. With the proposed mitigation measures in place, residual effects will be 'not significant'.

14.7.4 The assessment showed that the effect of additional road traffic emissions on air quality at existing residential properties is 'not significant'; air quality for future residents of the Proposed Development was also shown to be acceptable.

Mitigation and Enhancement

14.7.5 A package of measures has been identified based on the level of risk of adverse effects during the construction phase; these will be implemented at the Application Site during construction to minimise emissions.

14.7.6 The assessment has demonstrated that the overall effect of additional road traffic emissions generated by the Proposed Development will be 'not significant'. Specific mitigation measures are not therefore required. The Proposed Development will, however, include a number of design features and enhancements to encourage future residents to make sustainable and lower emission travel choices, and these will provide further benefits for local air quality.

Conclusion

14.7.7 Overall, the effects of the Proposed Development on local air quality have been found to be 'not significant'.

14.8 NOISE AND VIBRATION

14.8.1 The assessment has taken account of potential effects during the construction and operation of the Proposed Development, upon existing residential receptors and dwellings within the Proposed Development.

Baseline Conditions

14.8.2 A series of noise surveys were carried out to ascertain the noise levels around the Proposed Development, which have been used as the basis of the current assessment to identify potential effects.

14.8.3 Noise levels within the Proposed Development were generally low and principally influenced by distant road traffic travelling along surrounding roads and occasional light aircraft operating into Gloucestershire Airport during daytime periods.

Likely Significant Effects

14.8.4 The construction of the Proposed Development has the potential to give rise to short term adverse effects upon existing noise sensitive receptors surrounding the site. Appropriate mitigation and control measures would be adopted during construction to ensure any potential effects were minimised.

14.8.5 Road traffic on the roads within and surrounding the Proposed Development would change as a result of the occupation and operation of the completed scheme and other committed developments in the surrounding area. The assessment indicates that the additional road traffic would result in no significant adverse effects.

Mitigation and Enhancement

14.8.6 No additional noise mitigation measures have been identified in addition to those which would be incorporated into the design of the Proposed Development and considered at detail design stage.

Conclusion

14.8.7 In summary, with appropriate mitigation and control measures adopted during the construction of the Proposed Development, potential noise and vibration effects

would be reduced to an acceptable level, thus ensuring the Application Site is suitable for a residential led development.

14.9 HYDROLOGY, FLOOD RISK AND DRAINAGE

Baseline Conditions

14.9.1 The Application Site is considered to be in an area of low to moderate sensitivity in terms of the water environment. The baseline assessment for the Application Site has identified flood risk from surface water, and water quality as the main areas that could be affected by the Proposed Development.

Likely Significant Effects

14.9.2 The construction of the proposed development will generally have a negligible effect on the water environment however during construction in the short-term there is a possible risk of temporary minor adverse effects on water quality.

14.9.3 The Flood Risk Assessment at demonstrates that the Proposed Development will be safe from flooding, that flood risk will not be increased downstream, and that overall flood risk in the area will be reduced.

Mitigation and Enhancement

14.9.4 The use of SuDS as mitigation will manage and reduce flood risk and will ensure that there is no adverse effect on water quality. The effects of the Proposed Development on flooding and surface water drainage are considered to be minor beneficial.

14.9.5 The foul sewage from the development can be accommodated, subject to confirmation from Severn Trent Water of any improvements required which will be secured by the Applicant and Severn Trent Water. The effect of the development on the existing foul sewerage infrastructure is therefore considered to be negligible.

14.9.6 The cumulative effect of existing, approved, and proposed development in the area has been assessed and is considered to have a negligible to minor beneficial effect on Hydrology, Drainage, and Flood Risk.

Conclusion

14.9.7 Overall the development is considered to have a negligible to minor beneficial effect on Hydrology, Drainage and Flood Risk.

14.10 GROUND CONDITIONS AND CONTAMINATION

14.10.1 This chapter of the Environmental Statement considers the key impacts of the Proposed Development on human health, controlled waters and the land and ecosystem quality (both on site and the wider surrounding area) for the Application Site.

Baseline Conditions

14.10.2 Baseline conditions for this chapter were determined through desk study research supplemented with the results of intrusive ground investigation.

Likely Significant Effects

14.10.3 Various environmental issues have been considered and assessed in terms of their likely impact upon human health, controlled waters and the surrounding ecosystem. The risks have been assessed by consideration of the "source-pathway-receptor" concept, the behaviour of potential contaminants within the environment, current and foreseeable legislation, and the views of and good practices expected by the environmental regulators.

14.10.4 A single potential impact and risk to human health has been identified relating to both construction (development) and operational (completed development) phases. Contamination risk assessment shows the site to be locally contaminated with loose fibres of Chrysotile asbestos, therefore there is a specific requirement for remediation prior to construction.

14.10.5 There are not considered to be any cumulative effects relating to contaminated land arising from the Proposed Development and other known cumulative sites in the vicinity.

Mitigation and Enhancement

14.10.6 It is recommended that the asbestos is removed from site to protect groundworkers and all such material will need to be disposed of off-site at a suitably licensed landfill. It is recommended that some further investigation is undertaken (once all existing buildings have been demolished) to delineate the affected area and determine the volume of made ground requiring off-site disposal. The submission of a formal remedial strategy may be requested by the relevant authority detailing the method and timescales of such works.

14.10.7 Notwithstanding the above site personnel should always adopt good working practices in line with CDM Regulations 2015. It is also recommended that any temporary fuel storage tanks brought onto the site by construction contractors are suitably bunded to prevent leakages, whilst any spillages from tanks and/or mechanical plant should be cleared up immediately.

Conclusion

14.10.8 Pre-mitigation effects have been assessed and the type and description of an appropriate mitigation strategy outlined. On the basis that the required mitigation strategy is complied with, all potential impacts are considered to be 'insignificant'. There are not considered to be any residual impacts.

14.11 SUMMARY

14.11.1 The design of the Proposed Development has taken account of the likely significant environmental effects (alone and in-combination with other cumulative sites) and where necessary, mitigation measures form an integral part of the Proposed Development to ensure that the environment is suitably protected.

14.11.2 The ES demonstrates that there are no overriding environmental constraints which would preclude the Proposed Development on the Application Site.