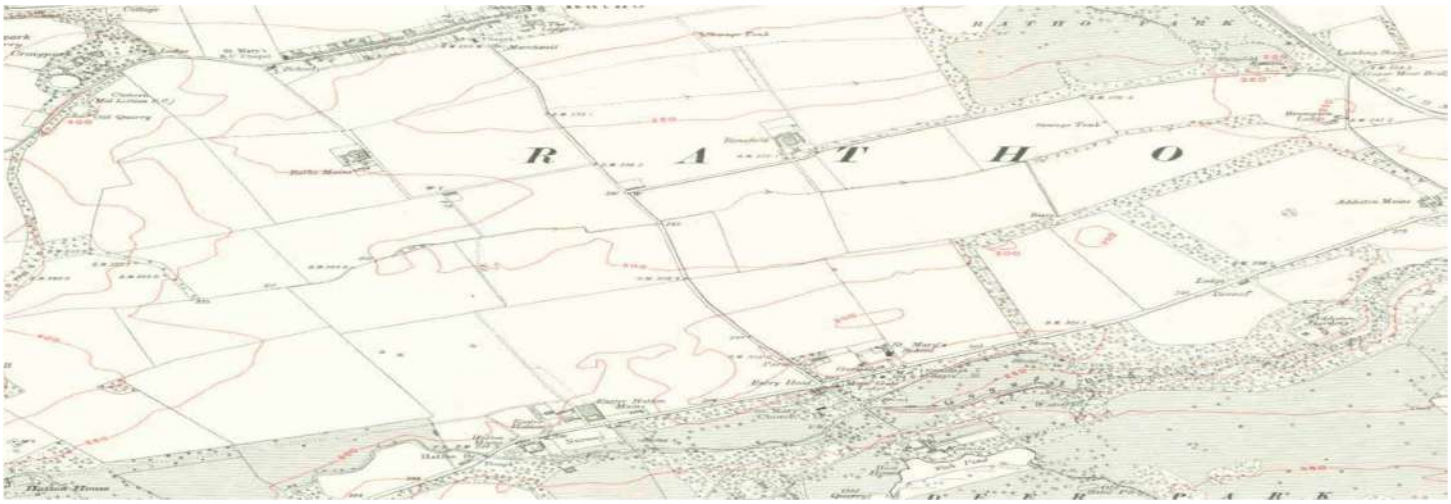
HATTON MAINS MIXED USE SITE
ENVIRONMENTAL ASSESSMENT REPORT
VOLUME 2: MAIN REPORT



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ABBREVIATIONS

AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekday Traffic
AEP	Annual Exceedance Probability
AMSC	Approval of Matters Specified in Condition
AQA	Air Quality Assessment
AQAL	Air Quality Assessment Level
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Areas
AOD	Above Ordnance Datum
ATC	Automatic Traffic Counters
AWI	Ancient Woodland Inventory
BAP	Biodiversity Action Plan
BGS	British Geological Survey
BPM	Best Practice Means
BS	British Standard
BTO	British Trust for Ornithology
CEC	City of Edinburgh Council
CAFS	Cleaner Air for Scotland
CAR	Controlled Activities Regulations
CEMP	Construction Environmental Management Plan
CIfA	Chartered Institute for Archaeologists
CITB	Construction Industry Training Board
CIWEM	Chartered Institution of Water and Environmental Management
CLP	Construction Logistics Plan
CoPA	Control of Pollution Act
CRTN	Calculation of Road Traffic Noise
CSGN	Central Scotland Green Network
CSM	Conceptual Site Model
CTMP	Construction Traffic Management Plan
CTR	Construction Traffic Route
DAS	Design and Access Statement
DMRB	Design Manual for Roads and Bridges
DTM	DTM Digital Terrain Model
EAR	Environmental Assessment Report
ECoW	Ecological Clerk of Works
EHO	Environmental Health Officers
EIA	Environmental Impact Assessment
ELC	European Landscape Convention
END	Environmental Noise Directive
EnvCoW	Environmental Clerk of Works
EPA	Environmental Protection Act
EPUK	Environmental Protection UK
EU	European Union
FEH	Flood Estimation Handbook
FFP	Functional Floodplain
FRA	Flood Risk Assessment
FTE	Full Time Equivalent
FWF	Fresh Water Fish
GDL	Gardens and Designed Landscapes
GEA	Gross External Area
GIA	Gross Internal Area
GIS	Geographic Information System
GP	General Practitioners
GPCD	General Practitioner Contractor Database
GPP	Guidance for Pollution Prevention
GVA	Gross Value Added
GWDTE	Groundwater Dependent Terrestrial Ecosystems
GLVIA	Guidelines for Landscape and Visual Impact Assessment

ha	Hectare
HCA	Homes and Communities Agency
HES	Historic Environment Scotland
HGV	Heavy Goods Vehicle
HLA	Historic Landscape Assessment
HLAMap	Historic Landscape Assessment Map
HMP	Habitat Management Plan
HSI	Habitat Suitability Index
HSMA	Housing Sub Market Area
HVAC	Heating, Ventilation and Air Conditioning
IAQM	Institute of Air Quality Management
IEA	Institute for Environmental Assessment
IEF	Important Ecological Features
IEEM	Institute of Ecology and Environmental Management
IEMA	Institute of Environmental Assessment and Management
IGDL	Inventory of Gardens and Designed Landscapes
IHT	Institution of Highways and Transportation
ISO	Organisation for Standards
JSA	Jobseekers Allowance
JTC	Junction Turning Counts
Km	Kilometre
LAQM	Local Air Quality Management
LBAP	Local Biodiversity Action Plan
LDP	Local Development Plan
LFT	Labour Forecasting Tool
LGV	Light Goods Vehicle
LiDAR	Light Detection and Ranging
LNR	Local Nature Reserve
LT	Landscape Type
LVIA	Landscape and Visual Impact Assessment
m^3	Cubic metres
m	Metres
mm	millimetre
mph	Miles per hour
NCN	National Cycle Network
NGD	Noise Generating Development
NIA	Noise Impact Assessment
NOMIS	Official Labour Market Statistics
NPF3	National Planning Framework 3
NR	Noise Rating
NRC	Noise Rating Curve
NRHE	National Record of the Historic Environment
NRTF	National Road Traffic Forecasts
NSD	Noise Sensitive Development
NSRs	Noise Sensitive Receptors
NTS	Non-Technical Summary
NVC	National Vegetation Classification
OS	Ordnance Survey
PAC	Pre-Application Consultation
PAN	Planning Advice Note
PBA	Protection of Badgers Act
PHFs	Peak Hour Factors
PIA	Personal Injury Accidents
PM	Particulate Matter
PoPP	Pollution Prevention Plan
PPE	Personal Protective Equipment
PPG	Pollution Prevention Guidelines
PPP	Planning Permission in Principle
PPPN	Pollution Protection Plan
PPV	Peak Particle Velocity

PRoW	Public Right of Way
PWS	Private Water Supplies
RBMP	River Basin Management Plan
RCA	Regional Character Area
RIGs	Regionally Important Geological Sites
RSPB	Royal Society for the Protection of Birds
RTA	Road Traffic Accidents
SAC	Special Area of Conservation
SAF	Species Action Framework
SBL	Scottish Biodiversity List
SDP	Strategic Development Plan
SEPA	Scottish Environment Protection Agency
SINC	Site of Importance for Nature Conservation
SM	Scheduled Monument
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SPAD	Scottish Palaeoecological Archive Database
SPG	Supplementary Planning Guidance
SPP	Scottish Planning Policy
SSSI	Site of Specific Scientific Interest
sqm	Square metres
SuDS	Sustainable Drainage System
SW	Scottish Water
SWT	Scottish Wildlife Trust
TA	Transport Assessment
TAN	Technical Advice Note
TPO	Tree Preservation Order
TS	Transport Scotland
TTWA	Travel to Work Areas
UKBAP	UK Biodiversity Action Plan
µg/m3	micrograms per cubic metre
WHO	World Health Organisation
WFD	Water Framework Directive
ZoI	Zone of Influence

GLOSSARY

Within this EAR Report the following terms are defined as follows:

A-Weighting	The auditory system is not equally sensitive throughout this frequency range. This is taken into account when making acoustic measurements by the use of A-weighting, a filter circuit which has a frequency response similar to the human auditory system. All the measurement results referred to in this report are A-weighted.
Above Ordnance Datum	Ordnance Datum is the vertical datum used by ordnance survey as the basis for deriving altitudes on maps. Topography may be described using the level in comparison or 'above' ordnance datum.
Ambient noise	The totally encompassing sound in a given situation.
Ancient Woodland	In Scotland, ancient woodland is defined as land that is currently wooded and has been continually wooded since at least 1750.
Applicant	Inverdunning (Hatton Mains) Limited
Aquifer	A geological formation (soil or rock) which is able to store water in significant quantities and transmit water relatively quickly under natural conditions (or when pumped).
Baseline	Environmental conditions at specific periods of time, present on, or near a site, against which future changes may be measured or predicted.
Biodiversity	Abbreviated form of 'biological diversity'.
Completed Development	Within the EAR this phase refers to the Proposed Development when fully built and operational.
Construction	Within the EAR this phrase refers to all construction works associated with the Proposed Development.
Cumulative effects	The summation of effects that result from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.
Decibels (dB)	Noise can be defined as unwanted sound. Sound in air can be considered as the propagation of energy through the air in the form of oscillatory changes in pressure. The size of the pressure changes in acoustic waves is quantified on a logarithmic decibel (dB) scale firstly because the range of audible sound pressures is very great, and secondly because the loudness function of the human auditory system is approximately logarithmic. The dynamic range of the auditory system is generally taken to be 0dB to 140dB. Generally, the addition of noise from two sources producing the same sound pressure level, will lead to an increase in sound pressure level of 3dB. A 3dB noise change is generally considered to be just noticeable, a 5dB change is generally considered to be clearly discernible and a 10dB change is generally accepted as leading to the subjective impression of a doubling or halving of loudness.
Effect	A physical or measurable change to the environment attributable to the project.

EIA Regulations	The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.
Environmental Impact Assessment (EIA)	A systematic means of assessing a development project's likely significant environmental effects.
Environmental Assessment Report (EAR)	Statutory report summarising the findings of an environmental impact assessment.
Façade Noise Level	A noise level measured or predicted at the façade of a building, typically at a distance of 1m, containing a contribution made up of reflections from the façade itself (+3dB).
Flood Risk Assessment (FRA)	A desk-based study which considers the contributing factors and predicts / quantifies the risk of flooding and also identifies a water level in the event of flooding.
Frequency	Frequency (or pitch) of sound is measured in units of Hertz. 1 Hertz (Hz) = 1 cycle/second. The range of frequencies audible to the human ear is around 20Hz to 18,000Hz. The capability of a person to hear higher frequencies will reduce with age. The ear is more sensitive to medium frequency than high or low frequencies.
Habitat	The environment in which populations or individual species live or grow.
$L_{Aeq,T}$	The A-weighted sound pressure level of the steady sound which contains the same acoustic energy as the noise being assessed over a specific time period, T.
L_{A10}	The noise level exceeded for 10% of the measurement period. It has been used in the UK for the assessment of road traffic noise.
L_{A90}	The noise level exceeded for 90% of the measurement period. It is generally used to quantify the background noise level, the underlying level of noise which is present even during the quieter parts of the measurement period.
L_{Amax}	Maximum value that the A-weighted sound pressure level reaches during a measurement period. $L_{Amax\ F}$, or Fast, is averaged over 0.125 of a second and $L_{Amax\ S}$, or Slow, is averaged over 1 second. Maximum noise levels were all monitored using the Fast response.
Landscape Character	The distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how this is perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place of different areas of the landscape.
Landscape Effects	Change in the elements, characteristics, character and qualities of the landscape as a result of development.
Landscape Sensitivity	The extent to which a landscape can accept change of a particular type and scale without unacceptable adverse effects on its character.
Local Nature Reserve (LNR)	Local Nature Reserve are places with wildlife or geological features that are of special interest locally.

Mitigation Measures	Actions proposed to moderate adverse effects arising from the whole or specific elements of a development including any process, activity or design to avoid, reduce, remedy or compensate for adverse environmental effects of a development project.
Non-Technical Summary	A report which briefly describes the main points discussed in the EAR in a clear manner, without the use of technical jargon and phraseology.
Phase 1 Habitat Survey	An ecological survey technique that provides a standardised system to record vegetation and wildlife habitats. It enables a basic assessment of habitat type and its potential importance for nature conservation. Each habitat type or feature is identified and presented on a map.
Proposed Development	Application for Planning Permission in Principle for residential led mixed-use development including business, retail, parkland/open space and associated open spaces and landscaping.
Public Right of Way (PRoW)	A right of passage by the public over the surface of the land without impediment. Public Rights of Way include public footpaths, bridleways and byways open to all traffic and Restricted Byways.
Receptor	A component of the natural, created or built environment such as human being, water, air, a building, or a plant that has the potential to be affected by the Proposed Development.
Residual Effects	Those effects of a development that cannot be mitigated following implementation of mitigation proposals.
Scoping	An exercise undertaken to determine the topics to be addressed within the EAR.
Screening	Consideration as to whether an environmental impact assessment is required for a project.
Site	The 64ha site at Hatton Mains.
Site of Special Scientific Interest (SSSI)	The nature conservation agencies have a duty under the Wildlife and Countryside Act 1981, as amended, to notify any area of land which in their opinion is 'of special interest by reason of any of its flora, fauna, or geological or physiographical features'. Such areas are known as Sites of Special Scientific Interest (SSSIs).
Sustainable Drainage System (SuDS)	Sustainable management practices designed to control the rate and quality of surface water runoff into receiving waters, for example the use of swales and wetlands as buffers, as opposed to conventional drainage practices.
Topography	The natural or artificial features, level and surface form of the ground surface.
Tree Preservation Order	A planning authority may make a TPO if it appears to them to be: • expedient in the interest of amenity; and/or • that the trees, groups of trees or woodlands are of cultural or historical significance.

	Section 160 (1) of the 1997 Act gives planning authorities powers to make TPOs and section 160 (3) sets out what provisions a TPO may include. The Town and Country Planning (Tree Preservation Order and Trees in Conservation Areas (Scotland) Regulations 2010 make provision for the form of a TPO and the procedure to be followed when making and confirming a TPO.
Visual Effect	Change in the appearance of the landscape from available viewpoints as a result of development.

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Chapter 1

Introduction

Chapter 1 Introduction

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1. Introduction

1.1 Introduction

McAleese & Associates (UK) Ltd has been instructed by Inverdunning (Hatton Mains) Ltd (hereafter referred to as "Inverdunning") to prepare an Environmental Assessment Report (EAR) in support of a representation to the Edinburgh Development Plan 2 (EDP2) Main Issues Report (MIR) for a residential led, mixed use development (hereafter referred to as "The Development") on land at Hatton Mains, City of Edinburgh, NGR NT 145 695 (hereafter referred to as "The Site"). The location of the site is shown in Figure 1.1.

This EAR draws together the findings of an Environmental Impact Assessment (EIA) process. EIA identifies the likely consequences for all aspects of the environment. The scope of the EIA reflects consultation responses received from key stakeholders during the scoping exercise. Although this EAR does not support a planning application, the process followed and rigor applied is the same as that for an EAR which would be submitted in support of an application for Planning Permission in Principle (PPP) for The Site.

1.2 Overview of the Proposed Development

1.2.1 Site Location

The Site is within the administrative area of the City of Edinburgh Council (CEC) and is located approximately 11km southwest of Edinburgh City Centre (Figure 1.1). The site extends to approximately 62 ha.

The site is bordered on the south by the A71 and to the east by a belt of mature woodlands. The rest of the site is bounded by agricultural fields. The site is also bisected by Dalmahoy Road, a minor road running between the A71 and the village of Ratho (Figure 1.2).

1.2.2 Site Description

The site consists of undeveloped, agricultural land and is situated within the greenbelt.

The site has no built structures within it. However, there are structures immediately bounding the site. Along the southern border of the site is located Ratho Park Carvery. On the opposite side of the A71 lies Dalmahoy Country Club and Golf Course. The farm of Easter Hatton Mains is situated on the south east corner of the site (Figure 1.3). None of these buildings form part of the application.

Whilst the site is not located within a Conservation Area, there are several listed buildings in close proximity to the site including Hatton House.

1.2.3 Proposed Development

Representation to the MIR is for the residential led development comprising the following:

- Approximately 1,200 residential units;
- Village centre comprising of local retail, leisure, healthcare / community centre, transport hub and flatted residential properties;
- Site provision for a single stream primary school / nursery;
- Open space and landscaping comprising of a neighborhood park, linear parks, local parks, amenity space plus new and retained woodland;
- Surface water drainage infrastructure comprising wetland, retention ponds and bioswales;
- Roads infrastructure including upgraded A71/Dalmahoy Road junction, new junction to he east onto A71, upgraded / amended Dalmahoy Road including new village square and new residential street network; and
- Footpaths / cycle paths including set back route adjacent to A71 on southern site frontage;

1.3 The Need for an EIA

This EA mirrors the requirements within *The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017* ('the EIA Regulations'). These require that any proposed development falling within the description of a 'Schedule 2 development' will be subject to an EIA

where such a development is likely to have 'significant' effects on the environment by virtue of its size, location or nature. The proposed development is classed as an '*Urban development project, including the construction of shopping centres and car parks, sports stadiums, leisure centres and multiplex cinemas'* that has an area in excess of 0.5 ha. As such, it falls under Schedule 2.10(b) of the EIA Regulations.

The proposal has been subject to a formal screening process under Section 2(10)b of the EIA Regulations. In providing the screening opinion (Appendix A2), The City of Edinburgh Council (CEC) concluded that, due to the environmental sensitivity of the location, along with the nature and scale of the environmental impacts associated with the construction, operation and decommissioning of the proposal, the development should be subject to a full EIA.

EIA is the process of collection, publication and consideration of environmental information in the determination of a planning application. The results of the EIA are presented in the EAR which reports on these effects. The effects of the representation to the MIR are reported in this EAR.

1.4 The Environmental Assessment Team

This EAR has been prepared by McAleese & Associates (UK) Ltd (M&A). M&A is a multi-disciplinary Environment and Environmental Impact Assessment consultancy, based in Kinross, Perth & Kinross offering specialist advice to private individuals and the residential and renewable energy development industries throughout the UK. The team has significant experience of working in the land, development and renewable energy industry, including with several national residential and mixed-use developers, local government, planning consultancies and land agency work. Established associations with the full range of technical disciplines, including consulting engineers, transportation consultants, heritage specialists and ecologists enables M&A to act as lead consultant or project manager in the progression of development projects through the Planning process.

Specialist input to the EAR has been provided as follows:

Specialism	Name of Specialist
EIA Project Management	McAleese & Associates (UK) Ltd
Planning	Pegasus Consultancy Ltd
Socio Economics and Human Health	McAleese & Associates (UK) Ltd
Archaeology and Cultural Heritage	AOC Archaeology Group
Biodiversity	Nigel Rudd Ecology – Phase 1 and Protected Species Survey Alan Motion Tree Consulting Ltd – Arboricultural survey Kleerkut – Invasive weeds survey Kinross Ecology – Pink Footed Goose survey
Soils and Geology	GM Civil and Structural Consulting Engineers Ltd
Flooding and Drainage	GM Civil and Structural Consulting Engineers Ltd Millard Consulting Ltd
Air Quality	The Airshed Ltd
Noise	The Airshed Ltd
Transport and Access	AECOM Ltd
Landscape and Visual Impacts	McAleese & Associates (UK) Ltd

Table 1.1 Specialist Input to EAR by Technical Discipline

The EA is comprised of a number of volumes:

- Volume 1 is the Non-Technical Summary (NTS);
- Volume 2 is the Main Report; and
- Volume 3 is the Technical Appendices;

The NTS is presented in non-technical language as far as possible to allow non-specialists and the community the opportunity to review the development proposal as well as the anticipated effects and to examine how these are proposed to be mitigated.

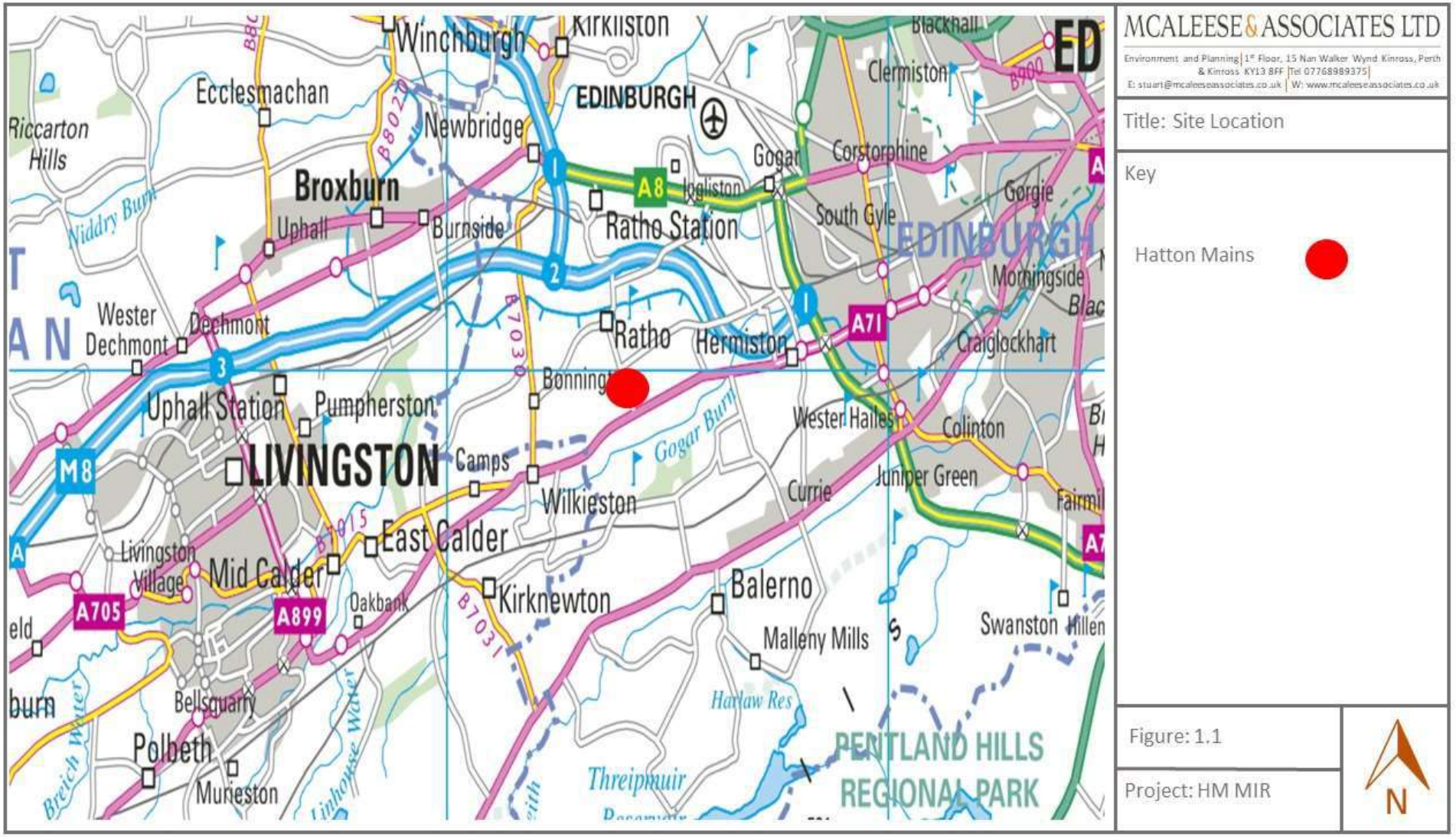
The Technical Appendices contain a number of reports which has informed the findings of the EIA. These specialist reports are:

- Human Health Rapid Assessment Tool output;
- A Phase 1 ecological survey;
- A tree conditions report;
- An invasive weeds survey report;
- Pink Footed Goose survey;
- Listed building and heritage survey;
- A Flood Risk Assessment (FRA);
- Sustainable Urban Drainage SUDs) design statement;
- A contaminated land condition report;
- A utilities report;
- A Transport Assessment; and
- A Landscape and Visual Impact Assessment;

1.5 Other Documents

A number of other documents have been submitted to the City of Edinburgh Council as part of this MIR representation. These are:

- Hatton Village – Planning Proposal;
- Community Engagement Statement;
- Education Impact Statement; and
- Design Statement & Indicative Masterplan.



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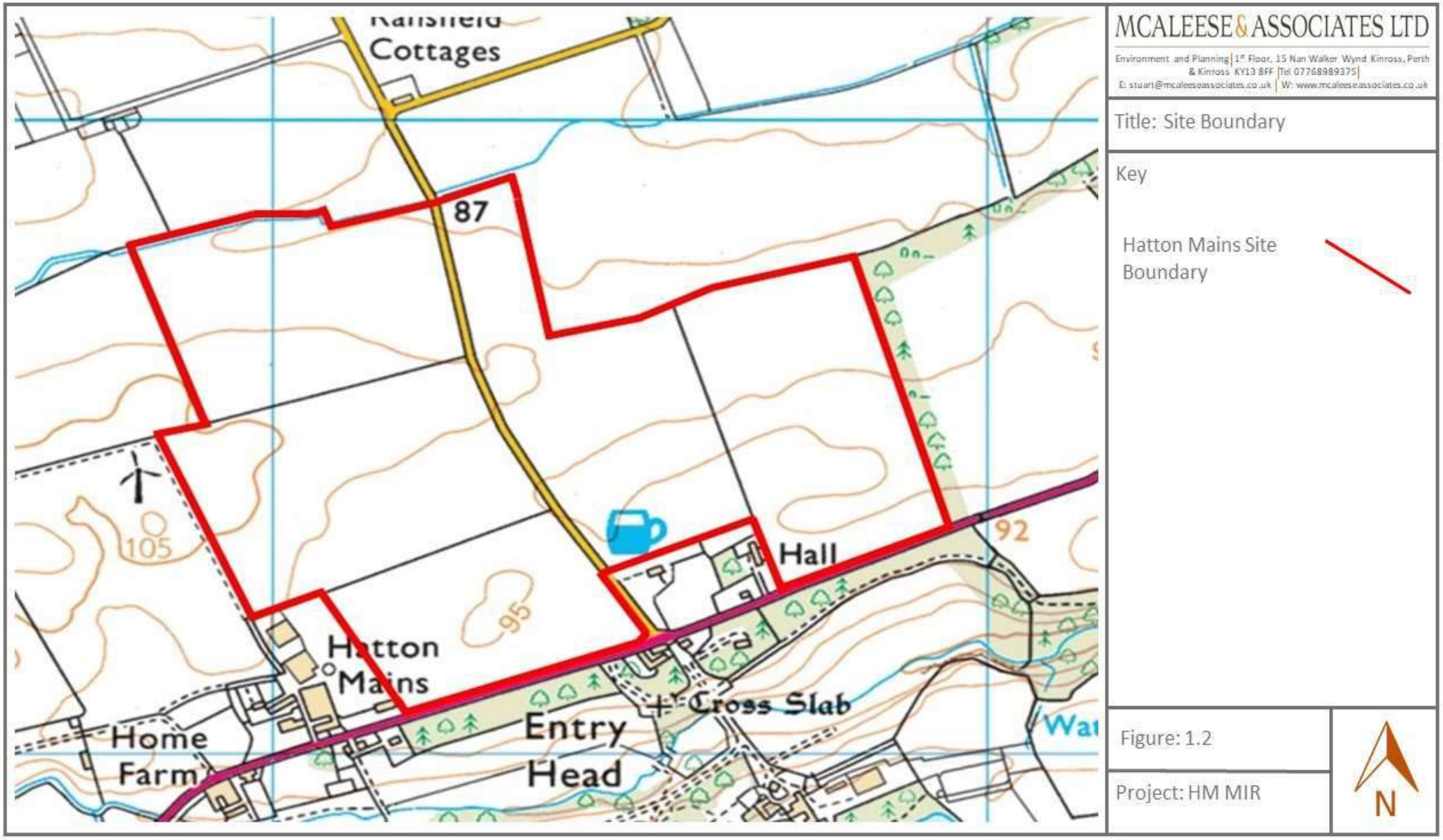
Title: Site Location

Key

Hatton Mains

Figure: 1.1

Project: HM MIR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Hatton Mains
Home Farm
Entry Head
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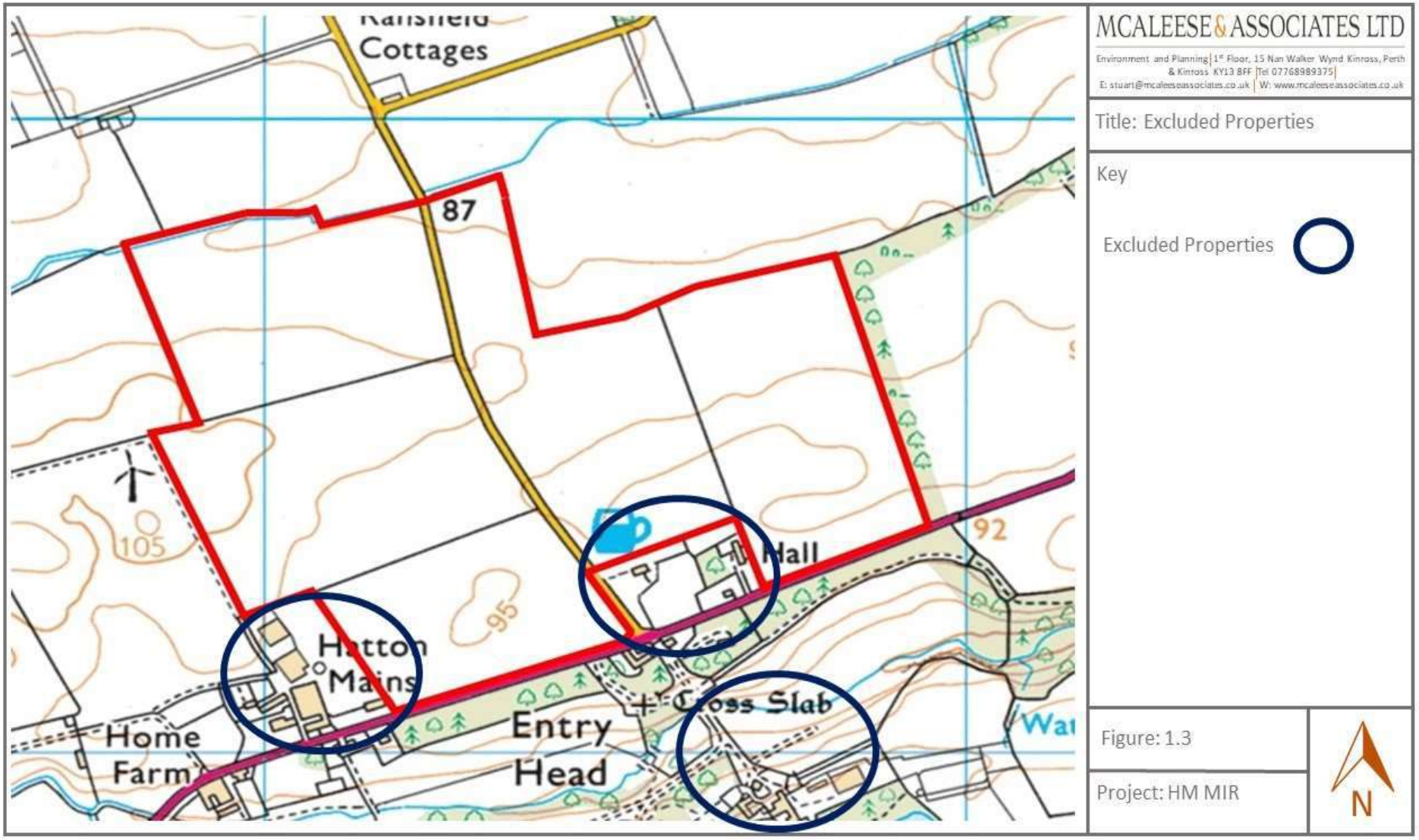
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Project: HM MIR
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Chapter 2

The Need for the Project

Chapter 2 The Need for the Project

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2. The Need for the Project

2.1 The Proposed Development

The Site is within the administrative area of the City of Edinburgh Council (CEC) and is located approximately 11km southwest of Edinburgh City Centre (Figure 1.1). The site extends to approximately 62 ha.

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- Open space and landscaping comprising of a neighborhood park, linear parks, local parks, amenity space plus new and retained woodland;
- Surface water drainage infrastructure comprising wetland, retention ponds and bioswales;
- Roads infrastructure including upgraded A71/Dalmahoy Road junction, new junction to he east onto A71, upgraded / amended Dalmahoy Road including new village square and new residential street network; and
- Footpaths / cycle paths including set back route adjacent to A71 on southern site frontage;

2.2 The Masterplan Framework

The Masterplan Framework has been prepared by Max Davidson Architecture on behalf of Hatton Mains (Inverdunning) Ltd to support the representation to the MIR. It establishes the key development and design parameters applicable to the site demonstrated through an indicative, conceptual layout. This have been informed through a thorough contextual site analysis, flood risk assessment, landscape and visual impact assessment and other environmental and technical studies, for example, looking at potential transport, noise and air quality impacts. The Framework has also been influenced through consultation with local community, stakeholders, City of Edinburgh Council, utilities service providers and other statutory bodies.

The Development Plan, which comprises the approved Strategic Development Plan for Edinburgh and South East Scotland *("SESplan",* approved 2013 with *Supplementary Guidance on Housing Land* approved 2014*)* and the Edinburgh Local Development Plan *("LDP",* adopted in 2016). SESplan is now technically out of date, being more than five years old in line with SPP, but still provides the broad spatial context for assessing development proposals at this time. A Proposed SESplan was published in 2016 but was rejected by Scottish Ministers in May 2019 and given the strategic development plans were abolished under the 2019 Act, a replacement will not be produced.

However, the SESplan authorities are working together to prepare a new Regional Spatial Strategy under the 2019 Act provisions although this is unlikely to be available until 2021 at the earliest. This Regional Spatial Strategy will be given material weight in considering planning applications. It will be regularly reviewed, and upon adoption, it will be submitted to Scottish Ministers for approval as Statutory Guidance. It provides guidance on the master planning process and urban design principles to be adopted for new development within CEC.

2.3 Planning Context

2.3.1 National Planning Policy

National planning policy provides the framework within which planning authorities are to assess development proposals and are key material considerations, as detailed within:

- National Planning Framework 3 *(NPF3; Scottish Government, June 2014);* and
- Scottish Planning Policy *(SPP; Scottish Government, June 2014)*.

These key policy documents set the context for regional and local planning in Scotland and are key material considerations in the determination of any planning application. Both documents are currently under review following approval of the Planning (Scotland) Act 2019 and a new National Planning Framework 4 (which will combine both documents) is expected to be published in draft later in 2020.

SPP Paragraphs 53 & 54 outline the Government approach to the creation of new settlements:

"The creation of a new settlement may occasionally be a necessary part of a spatial strategy, where it is justified either by the scale and nature of the housing land requirement and the existence of major constraints to the further growth of existing settlements, or by its essential role in promoting regeneration or rural development"

"Where a development plan spatial strategy indicates that a new settlement is appropriate, it should specify its scale and location, and supporting infrastructure requirements, particularly where these are integral to the viability and deliverability of the proposed development. Supplementary guidance can address more detailed issues such as design and delivery".

Overall, in terms of SPP, the proposal for a new stand-alone settlement at Hatton Village could be promoted in line with existing policy and can be justified with a suitable infrastructure and design approach.

2.3.2 Development Plan

The Development Plan, which comprises the approved Strategic Development Plan for Edinburgh and South East Scotland *("SESplan",* approved 2013 with *Supplementary Guidance on Housing Land* approved 2014*)* and the Edinburgh Local Development Plan *("LDP",* adopted in 2016).

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In terms of housing needs, based on the emerging Local Plan 2 and if utilising the 2015 Housing Need and Demand Assessment, there is a need to identify land for between 17,600 and 27,900 new homes (net of existing land supply) depending on which option is preferred. Clearly, there is a need for a significant level of housing land which will require to include greenfield sites if the housing demand and growth aspirations are to be met.

The Choices for City Plan 2030 document has a preferred option which provides for all new housing within the existing urban area, with alternatives including either a 100% greenfield option or a combined urban/greenfield approach.

2.3.3 SESplan Spatial Policy

SESplan Policy 1A sets out existing spatial policy with West Edinburgh identified as a Strategic Development Area based upon existing and planned transport infrastructure and employment opportunities. The Proposed SESplan 2 (prior to rejection) identified the A71 corridor as a long term

growth area (see Figure 3 on Page 7) whilst the on-going West Edinburgh Study (referred to within Choices for City Plan 2030) identifies a wider West Edinburgh area to investigate where key infrastructure can be best implemented to support LDP growth requirements.

Hatton Village would form a new settlement which, as set out within supporting documents including an Environmental Impact Assessment, could be implemented without any significant adverse impacts upon either the Edinburgh Green Belt or infrastructure, subject to suitable funding contributions.

2.4 Economic Benefits

As a residential development with elements of supporting uses, including mixed use development, the Hatton Mains proposal will seek to contribute to the local and regional economy in the following ways:

Construction Phase

- Direct employment within the construction industry and supporting sectors during phased construction period; and
- Indirect employment generation through supply of goods and services to the proposed development.

Operational Phase

- Creation of a high-quality new settlement, supporting and contributing to the delivery of development targets and objectives set out in regional and local planning policy, including the Strategic Development Plan for Edinburgh and South East Scotland *(*SESplan approved 2013*)* and the Edinburgh Local Development Plan *(*LDP*,* adopted in 2016);
- Upgraded site access and improved public transport serving the local area;
- Providing homes for the local workforce which services business and enterprise in Edinburgh and wider West Lothian area; and
- Offering scope for local employment within the various new mixed uses on site.

2.5 Supporting The City of Edinburgh

The proposed development seeks to integrate the new residential and mixed uses within a wider spatial framework of existing communities, complementing these facilities and supporting the local economy. Benefits are anticipated as follows:

- Local employment during construction phases and opportunities for business start-ups within the remote working hub;
- Provision of greenspaces and promoting public access through the site and the wider area with linkages to the surrounding countryside;
- Provision of affordable housing within the development across a range of housing types e.g. detached, terraces, semi-detached and an element for apartments;
- Establishing connections between new settlement and existing community at Ratho will promote the use of local services and businesses;

2.6 Conclusion

Overall, the proposals seek to enhance the immediate environment and develop a new community growth area at Hatton Mains. The proposals constitute a sustainable community that fulfills the requirements of the Development Masterplan and seeks to contribute towards housing provision in line with allocations outlined in the adopted SESplan and the anticipated Regional Spatial Strategy.

The proposed development:

- Provides additional housing of mixed tenure to contribute to meeting housing supply requirements in the City of Edinburgh area;
- Identifies clear linkages and improves pedestrian/ cycle accessibility within the wider area;
- Extends the existing road network to meet new transport demand/ public transport;
- Creates a strong greenspace/ footpath/ cycleway network; and

- Minimizes impacts on wider landscape/ natural heritage/ setting and maximizes the quality of the site through landscape strategy, design principles and environmental enhancements.

Chapter 3

The Proposed Development

Chapter 3 The Proposed Development

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3. The Proposed Development

3.1 Introduction

This chapter outlines the locational and design characteristics of the Proposed Development, as well as the proposed construction methods, with an emphasis on those elements that may have an environmental impact.

This Chapter also highlights where environmental mitigation by design is achieved, particularly where design elements have been put in place to minimise environmental effects as well as enhance the existing environment.

3.2 Development Location

The site, as shown in Figure 3.1, is located approximately 11 kilometres to the southwest of Edinburgh City Centre, located within the administrative boundary of the City of Edinburgh Council.

The site is approximately 58.5 ha in size, consisting of previously undeveloped land, in the form of agricultural fields, in the greenbelt.

The site is bordered by the A71, to the south, and by agricultural fields to the north, northwest and mature woodlands to the east. To the southwest, lies Easter Hatton Mains and along the southern border lies Ratho Park Carvery which incorporates St Mary's church hall and refectory cottage (a listed building). This building lies outwith the existing development site and, hence, will be retained. The site is bisected by the Dalmahoy Road, a duel lane minor road, and is served by the X28 bus service, which goes direct to Edinburgh Town Centre, and service 28, which gives access to Haymarket Station.

The Dalmahoy Country Club and golf course lies on the opposite side of the A71, to the south.

As far as is presently known, the site has not been subject to previous industrial activities. It is not in an area affected by historical mining, although it does lie above a coal-field. Whilst the site is not situated within a conservation area, it does lie in close proximity to a number of listed buildings and also in close proximity to a Garden and Designed Landscape Area, in the form of Hatton House, a degraded, but important, landscape character.

The site is not in an area at risk of fluvial flooding, but some surface water flooding is a possibility at the northern boundary and south-eastern quarter of the site. The site does not lie in close proximity to an area protected for its ecological value. The site does not lie within an air quality management area.

3.3 Development Design

This MIR representation concerns plans for a residential-led development with community centre and a potential educational facility. It will include a neighbourhood park and associated greenspaces.

The western and eastern side of the proposed development will see the construction of up to 1,200 new homes of mixed form including; detached, semi-detached, terraced and apartments. It will contain affordable provision of at least 25%. The central block will contain the village centre formed by local retail amenities and a neighbourhood centre, with an adjacent park.

The development site will be enhanced by new woodland planting, along the west and northern boundaries of the site, with and upgrade and enhancement of the existing Dalmahoy Road.

The site boundary is shown in Figure 3.2. The layout of the scheme is shown in Figures 3.3 and 3.4. It is comprised of three distinct sections, with a residential led mixed-use development to accommodate approximately 1,200 homes plus a community hub with the ability to provide various local retail/leisure/community uses. The layout includes a linear parkland corridor that would contain surface water treatment features, active travel routes and an extensive landscape framework (containing active and passive recreational uses).

3.3.1 Housing

The homes are divided into a series of blocks and will be two to three stories high. It is envisaged that they will be of traditional brick build with render finish, combined with tiled roofs. Homes will be a mixture of flats, semi-detached/terraced and detached homes as shown in Table 3.1.

Housing Type	Proportion	Number
1 bed	2%	24
2 bed	25%	300
3 bed	40%	480
4 bed	25%	300
5 bed	8%	96
Total	**100%**	**1,200**

Table 3.1 Housing type mix

It is anticipated that a minimum of 25% of housing would be affordable housing and managed by a housing association.

3.3.2 Commercial and Employment

Localised commercial provision will be supplied within the central hub. This could provide up to 680m^2 of local retail, leisure and / or commercial / healthcare space.

3.3.3 Open Green Space

The open greenspace aspect of the development is sizable, occupying a significant part of the development site. It has been closely integrated with the surface water drainage infrastructure to increase overall water retention and infiltration potential of the entire development. All greenspaces will be planted using indigenous species.

The open greenspace facilities provided within the development are summarised in the supporting Design and Access Statement.

3.3.4 Sustainable Drainage

A surface water drainage strategy has been prepared. The proposed surface water drainage network servicing the proposed development will comprise of a gravity closed pipe network, draining surface water runoff from roofs and other impermeable areas (such as roads, car parking and hardstanding) to the linear wetland/swale features running through the site. These will route the surface water flows through a detention basin and pond prior to discharge to the burn on the northern edge of the site. The wetland / swale, along with the detention basin and pond will be integral part of the landscape treatment and open space proposals for the site and active travel routes will also be associated with these linear features.

3.3.5 Access

Public Transport

There is xisting bus route provision, with a regular/high frequency service along the A71 (30 minutes to City Centre) with existing bus stops on the site boundary. Hermiston Park and Ride is located approximately 2.5 miles east of the site providing another option to access wider services. There is scope and appetite to link to existing services to the north and east of the site. This is assessed within the supporting Transport Assessment (Appendix I).

In terms of rail, Currie Station is within approximately 2.5 miles of the site with scope for park and ride or access by cycle.

Vehicular

The proposed site adjoins the A71, a main arterial route with the minor Dalmahoy-Ratho Road bisecting the site. This provides the opportunity to link directly to both local and strategic roads without significant new physical infrastructure. The A71 connects with the A720 Edinburgh City Bypass, approximately 3 miles to the east, with onward links to Edinburgh City Centre, the motorway network (M8/M9) and east central Scotland.

Cycling & Walking

The Core Path network is accessible within 1,600m of the site with CEC15 (Union Canal) accessed at Ratho (or east of Ratho Park Golf Course) providing an east-west link which is also a national cycle route (NCR754) providing direct access to Edinburgh City Centre.

Servicing

It is anticipated that service vehicles accessing the site would be limited to the collection of refuse and incidental deliveries to residential properties. This is likely to occur on street in proximity to the frontage of properties so as to minimise disruption to other road users. Sewerage and water supply, along with utilities, would likely be connected into within the eastern end of the B7015.

3.4 Construction

This section describes the anticipated construction methodology and likely phasing of the Development. Consideration of likely significant effects on the environment that may arise during the construction phase, and any necessary mitigation measures, are provided within the respective technical chapters of this Environmental Assessment report (EAR) and summarised in Chapter 16.

Planning for construction is necessarily broad at this stage and may be subject to modification. This chapter is based on reasonable assumptions and experience and allows assessment of the realistic 'worst case' construction phase effects.

3.4.1 Anticipated Construction Programme

Construction activities will include:

- land clearance;
- emplacement of foundations; and
- construction of:
  - the foul drainage system;
  - the surface water drainage system;
  - the main access road and all side roads;
  - 2-3 story houses and flats;
  - the community hub;
  - public green spaces; and
  - a surface water management system that is fully integrated with the landscape framework for the
  - site.

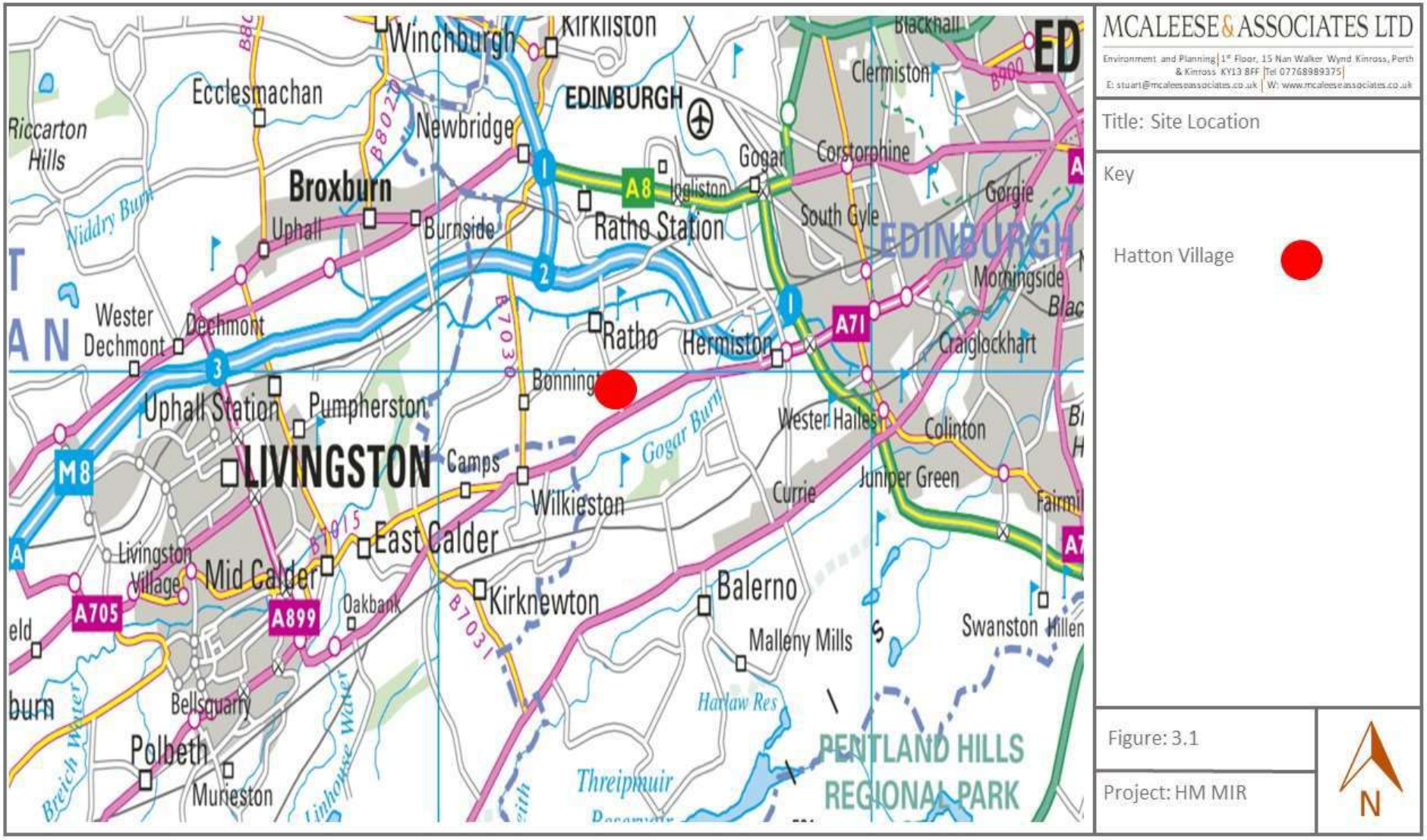
The development will probably be delivered in a series of development sub-phases that will likely be between 50 and 150 homes; the particular combination of land uses included within each sub- phase, and number of new homes, being confirmed in due course.

Allowing for a Phase 1 detailed application and associated technical approvals, a site start could be feasible by late 2021 with first completions by Summer 2022. Assuming a minimum of 3 developers (private & affordable), it is considered that approximately 150 units per annum could be completed once the site is fully under construction, as illustrated below:

Year	Units
2022 / 2023	50
2023 / 2024	150
2024 / 2025	150
2025 / 2026	150
2026 / 2027	150
2027 / 2028	150
2028 / 2029	150
2029 / 2030	150
2030 / 2031	100
Total	**1,200**

Table 3.2: Phased delivery of housing numbers

The associated infrastructure necessary to facilitate the delivery of each sub-phase of development, be that transport infrastructure, utilities and services, community facilities and drainage will be delivered commensurate with for each sub-phase of development. Any wider infrastructure improvements will be delivered to a programme to be agreed with CEC.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Title: Site Location
Key
Hatton Village
Figure: 3.1
Project: HM MIR
N
Winchburgh
Kirkliston
EDINBURGH
Ecclesmachan
Newbridge
Riccarton Hills
Broxburn
Uphall
Burnside
Ratho Station
Ingliston
Gogar
Corstorphine
Clermiston
Blackhall
South Gyle
Gorgie
Morningside
Wester Dechmont
Dechmont
Ratho
Hermiston
Craiglockhart
Uphall Station
Pumpherston
Bonnington
LIVINGSTON
Camps
Wilkieston
Gogar Burn
Wester Hailes
Colinton
Juniper Green
Currie
East Calder
Livingston Village
Mid Calder
Kirknewton
Balerno
Oakbank
Malleny Mills
Swanston
Bellsquarry
Polbeth
Harlaw Res
Threipmuir
PENTLAND HILLS REGIONAL PARK
Murieston
M8
A8
A71
A705
A899
B7030
B7031
B7015


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Title: The Site Boundary
Key
Figure: 3.2
Project: HM MIR
N

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Title: The Site Layout

Key

Figure: 3.3

Project: HM MIR

N


distant view to edinburgh castle
distant view to arthur's seat
distant view to arthur's seat
LINEAR PARK
PARK
TRANSPORT HUB
COMMUNITY/ EDUCATION (1.45Ha)
VILLAGE
PARK
FRONTAGE
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Title: The Site Layout
Key
Figure: 3.4
Project: HM MIR
N

Chapter 4

Consideration of Alternatives

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Chapter 4 Consideration of Alternatives

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4 Consideration of Alternatives

4.1 Introduction

This chapter provides a description of the process for considering potential alternatives to the type and layout of development on the Masterplan for the site and whether each option meets the desired development objectives.

Strategic alternatives to the proposed development were reviewed and include:

- Development of new community elsewhere – e.g. alternative site;
- No development on site – no development of additional residential units and associated community and greenspace uses; and
- Residential-led mixed use development - the 'preferred use';

Detailed alternatives for mixed use development were then considered. This process has involved consideration of the influencing factors posed by existing site features, including topography, ground conditions, drainage features and environmental considerations.

The development layout has also been influenced by consultation responses in parallel with understanding the existing sensitivities and constraints.

Iterations of the preferred development included analysis of the most optimal locations for the built and landscaped elements, so as to avoid impacts on key landscape features, such as key views towards Edinburgh and The Pentland Hills.

Detailed alternatives examined alternative street layouts, building massing and height.

The assessment of alternative options concludes that the rural setting of the proposed Hatton Village site offers a significant opportunity to establish a new sustainable, neighbourhood within close proximity to the City of Edinburgh.

This chapter should be read in conjunction with the Design Statement (Pegasus Consulting, 2020).

4.2 Legislative Context

The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 requires the developer to include in the EAR an outline of the main alternatives to the proposed development and the justification for taking forward a preferred option.

Within the terms of the regulations, the EAR must include an outline of the main alternatives studied by the applicant and an indication of the main reasons of the choice, taking into consideration the environmental effects.

Best practice in EIA defines the consideration of alternatives as the documentation of the site selection process and the analysis of reasons for development on a chosen site. Thus, environmental factors must be considered when evaluating the overall benefits of the project.

4.3 Planning Context

4.3.1 National and Regional Policy

National planning policy provides the framework within which planning authorities are to assess development proposals and are key material considerations, as detailed within National Planning Framework 3 *(NPF3; Scottish Government, June 2014)* and Scottish Planning Policy *(SPP; Scottish Government, June 2014)*. These key policy documents set the context for regional and local planning in Scotland and are key material considerations in the determination of any planning application. Both documents are currently under review following approval of the Planning (Scotland) Act 2019 and a new National Planning Framework 4 (which will combine both documents) is expected to be published in draft later in 2020.

NPF3 highlights the need to implement a development strategy which supports growth of existing communities and creates sustainable patterns of travel and land-use, whilst balancing existing

character, built and natural assets. This need is at its greatest in South East Scotland, with NPF3 highlighting the need to *"see greater and more concerted effort to deliver a generous supply of housing land in this area"* (p.13) with Edinburgh the key service centre.

This approach is supported by SPP (Para. 28 & 29) which, *"introduces a presumption in favour of development that contributes to sustainable development"* and revisions to SPP provide the context for bringing forward larger scale proposals to meet significant land supply issues.

SPP Paragraphs 53 & 54 outline the Government approach to the creation of new settlements:

"The creation of a new settlement may occasionally be a necessary part of a spatial strategy, where it is justified either by the scale and nature of the housing land requirement and the existence of major constraints to the further growth of existing settlements, or by its essential role in promoting regeneration or rural development"

"Where a development plan spatial strategy indicates that a new settlement is appropriate, it should specify its scale and location, and supporting infrastructure requirements, particularly where these are integral to the viability and deliverability of the proposed development. Supplementary guidance can address more detailed issues such as design and delivery".

The provisions of SPP require that any proposal is assessed in terms of identifying any adverse impacts that would *"significantly and demonstrably outweigh the benefits"* when assessed against the wider policies of SPP, including:

- National outcomes in relation to creating places which are *well designed, sustainable, low carbon, connected and resilient places.*
- Sustainability Policy; net economic benefits, responding to economic issues, challenges and opportunities, supporting good design, supporting local centres, potential to improve viability and sustainability of local transport and service provision, no adverse impact upon flood risk, cultural or natural heritage assets, opportunity for improving health and well-being through access to recreation.
- Placemaking Policy; meet the key qualities of creating a successful place and being located in the right place in terms of context and demand, a sensitive, contextual development in line with Government policy including *Creating Places (2013)* and *Designing Streets (2010)*.
- Housing Policy; the proposal contributes to the effective housing land supply and create range and choice.
- Historic Environment Policy; no adverse impact upon the historic environment, subject to suitable design and landscape treatment.
- Natural Environment Policy; no adverse impact on landscape character.
- Green Infrastructure Policy; design and landscaping allowing for integration of the site.
- Flood Risk & Drainage Policy; no flood risk and suitable SUDS and drainage impact.
- Sustainable Transport Policy; increase in vehicular movement can be mitigated with public transport, walking and cycling prioritised.

Overall, in terms of SPP, the proposal for a new stand-alone settlement at Hatton Village could be promoted in line with existing policy to meet housing land requirements via the Local Development Plan process.

As detailed within the main Representation document, the housing land supply basis for bringing forward a large-scale proposal can be justified and with a suitable infrastructure and design approach, the proposal could constitute sustainable development with no adverse impact which would "significantly and demonstrably" outweigh the benefits delivered.

4.3.2 Development Plan

The Development Plan, which comprises the approved Strategic Development Plan for Edinburgh and South East Scotland *("SESplan",* approved 2013 with *Supplementary Guidance on Housing Land* approved 2014*)* and the Edinburgh Local Development Plan *("LDP",* adopted in 2016).

SESplan is now technically out of date, being more than five years old in line with SPP, but still provides the broad spatial context for assessing development proposals at this time. A Proposed SESplan was published in 2016 but was rejected by Scottish Ministers in May 2019 and given the

strategic development plans were abolished under the 2019 Act, a replacement will not be produced. However, the SESplan authorities are working together to prepare a new Regional Spatial Strategy under the 2019 Act provisions although this is unlikely to be available until 2021 at the earliest.

4.3.3 Housing Land Requirements

The main Representation document addresses housing land requirement in the context of Edinburgh's proposed options to cover the new Local Development Plan period up to 2032.

In summary, based on the emerging Local Plan 2 and if utilising the 2015 Housing Need and Demand Assessment, there is a need to identify land for between 17,600 and 27,900 new homes (net of existing land supply) depending on which option is preferred.

The Choices for City Plan 2030 document has a preferred option which provides for all new housing within the existing urban area, with alternatives including either a 100% greenfield option or a combined urban/greenfield approach.

As set out in the Representation document, whichever methodology is applied, there is a need for a significant level of housing land which will require to include greenfield sites if the housing demand and growth aspirations are to be met. This provides the justification for a new village proposal as outlined in this document.

4.3.4 SESplan Spatial Policy

SESplan Policy 1A sets out existing spatial policy with West Edinburgh identified as a Strategic Development Area based upon existing and planned transport infrastructure and employment opportunities. The boundaries of the West Edinburgh growth area do not extend south of the A8 at present, which is reflected at LDP level with significant housing allocations proposed at Gogar, South Gyle, Maybury and Cammo.

The Proposed SESplan 2 (prior to rejection) identified the A71 corridor as a long term growth area (see Figure 3 on Page 7) whilst the on-going West Edinburgh Study (referred to within Choices for City Plan 2030) identifies a wider West Edinburgh area to investigate where key infrastructure can be best implemented to support LDP growth requirements. The Hatton Village site is located within this West Edinburgh Study search area and provides scope for significant growth outwith current Strategic Development Area boundaries.

SESplan Policy 7 sets out the criteria by which greenfield sites should be assessed to allow for new sites to come forward to address an identified land supply shortfall. These criteria relate to impact on existing settlement/area character, impact on Green Belt objectives and the need for any additional infrastructure required to be either committed or funded by the developer.

Hatton Village would form a new settlement which, as set out within supporting documents including an Environmental Impact Assessment, could be implemented without any significant adverse impacts upon either the Edinburgh Green Belt or infrastructure, subject to suitable funding contributions.

4.3.5 LDP Designations

The Hatton Village site is currently protected by Policy Env10 - Green Belt.

SESplan Policy 12 (Green Belts) sets out the key criteria to be achieved, being:

a) Maintain the identity and character of Edinburgh and Dunfermline and their neighbouring towns, and prevent coalescence, unless otherwise justified by the local development plan settlement strategy;
b) Direct planned growth to the most appropriate locations and support regeneration;
c) Maintain the landscape setting of these settlements;
d) Provide opportunities for access to open space and the countryside.

As a stand-alone development, the proposal at Hatton Village would create its own definition in terms of place character and would therefore be a positive approach in terms of remaining separate from Edinburgh. It is therefore considered criteria (a) could be addressed as a fully-planned new settlement.

This would also be the case with criteria (b), on the basis that the proposal can be supported by the City of Edinburgh Council as a suitably located new settlement to address the growth strategy requirements.

Criteria (c) in relation to maintaining Edinburgh's landscape setting is addressed via the supporting Environmental Impact Assessment and the proposed design and landscape approach at Hatton Village ensures impact from key views is mitigated.

Overall, the creation of a new settlement at Hatton Village would assist with maintaining the original purpose of the Edinburgh Green Belt by retaining separation between the City and a new growth area.

4.4 Opportunities and Constraints

Potential Opportunities

- To create a new western 'gateway village' close to the City of Edinburgh;
- To create an attractive new neighbourhood close to the City of Edinburgh;
- To provide employment opportunities in a commercially-viable location (off A71);
- To provide space for a new primary school where the existing schools are at capacity;
- Opportunity for new settlement approach to support Edinburgh's growth strategy, with location on main arterial route continuing historic spatial pattern;
- Low-lying landscape minimising visual impact with existing landscape features capable of screening and framing development;
- Increased amenity accessibility for local community with significant new greenspaces, permeable layout and high quality path/street network;
- Utilise existing levels to create attractive SUDS wetland features through the site;
- Opportunity to reflect 'country estate' entrance character at southern edge of site; and
- Linkage to existing public transport route (A71) and extension of links via Dalmahoy Road into site.

Constraints

- Flood risk from the small stream on the northern edge of the proposed development site;
- Existing boundary features such as hedges and mature woodland;
- Main road (A71) d Dalmahoy Estate acts as a boundary to the south;
- Existing tree/landscape habitat to be retained where possible including buffers to avoid over-shadowing;
- Buffer flood zone required to adjacent burn to north;
- Need to protect amenity of existing properties on southern boundary;
- Need to ensure longer range views are incorporated with landscape mitigation for any views towards listed buildings; and
- Protect setting of nearby protected landscapes (SLA, Hatton).

4.5 Project Vision

The development proposals have been established following a vision and set of objectives for the Hatton Village site.

4.5.1 Vision & Objectives

The Masterplan for Hatton Village was developed within the context of the Vision for the site:

"Hatton Village will be form a new community, close to West Edinburgh but having its own identity with a village square, local amenities and attractive residential neighbourhoods set within a green network of parks and woodland.

The design of the village will acknowledge its landscape setting, with long range views to Edinburgh Castle, Arthurs Seat and the Pentlands incorporated, reflecting the original design approach of former country house estates in the locality (Hatton, Dalmahoy, Ratho Park). This will also be reflected in the entrance to the village from Dalmahoy/A71, which will reflect a tree-lined 'country house' approach.

The new community will be centred on the existing Dalmahoy Road, just north of the A71 main transport route which provides direct links to Edinburgh and Livingston. Dalmahoy Road will form the spine of the village and allow for bus connection with a permeable network of residential streets extending to east and west. A new footpath and cyclepath route, set back from the A71, along the southern edge of the site will provide a safer route for local users.

A new linear neighbourhood park will extend through the village with smaller linear and local parks creating biodiversity and amenity greenspace links throughout the community whilst providing natural areas for surface water drainage.

The village hub will form the main focus and will provide an opportunity for local shops and services around a village square with an adjoining site for a new primary school with scope to act as a community hub.

Higher density housing including apartments and terraces will be focused on the village hub with medium density housing blocks framed by greenspace extending through the middle and southern areas of the village. The northern part of the village will have lower density housing reflecting the transition towards the countryside edge."

The Masterplan developed by Inverdunning (Hatton Mains) Ltd sets out key sustainable placemaking objectives which have driven the design and implementation of development:

- Create an attractive and distinctive place for living, learning and working;
- Provide for a balanced mix of local housing needs and demands;
- Provide new primary school space within a highly accessible location;
- Provide local employment opportunities within the village centre, enhancing local businesses and training;
- Provide new greenspace infrastructure as part of an accessible and connected greenspace network;
- Ensure development fits harmoniously with its surrounding landscape and that any negative impacts are minimised and mitigated;
- Promote walking and other sustainable travel options by:
    - maximising access opportunities to existing Core Path Networks and cycling networks;
    - providing a well-connected movement network offering direct and convenient routes throughout the development, ensuring ease of movement and access to services and amenities, including access to green space and the countryside;
    - providing safe and welcoming streets and public spaces;
- Manage surface water runoff through a sustainable urban drainage system (SUDS) which is fully integrated with the landscape design; and
- Minimise waste, and to use resources efficiently during construction and on-going maintenance.

4.5.2 Design Concept

The design concept takes into consideration key site analysis and technical studies. It seeks to provide the following:

- Retain and enhance green buffer along site boundaries with adjoining greenspace as transition between development and countryside;
- Wetland/basins as surface water treatment on site, utilising natural drainage of site and minimising impact;
- Extend new greenspace through site, with linear /local parks maximising views to Edinburgh and Pentlands and utilising existing hedgerow/trees;
- Village hub designed on main street / square principle, transport hub, mix of local uses, adjoining school site, neighbourhood park and greenspace links;
- Residential areas of varying density, higher to lower (northern part of site) from village hub centre to be framed by existing and new greenspace and key routes
- Village main street on Dalmahoy Road with close connection to main transport route (A71) to allow for maximum connectivity for existing/ extended bus services, cycling and walking; and

- Village entrance from south reflecting 'country estate' approach. Permeable street network.

4.5.2 Design Evolution

The Masterplan evolved through the following stages:

Stage 1: Initial land use in grid form

Stage 2: Village core fronting A71, greenspace developing

Stage 3: Density study complete

Stage 4: Village core moves to centre

Stage 5: Village core on lower ground, views protected

Stage 6: Flood zone incorporated

4.5.3 Development Principles

The development at Hatton Village has been developed along clear principles. These are:

A Clear Structure

- The gentle ridge in the centre of the site is retained and incorporated as a green corridor. Together with the general topography, this corridor serves to define three distinct areas of built development – the north, the centre and the south;
- A central Village hub with retail, public transport facilities and an adjoining community / education area;
- Decreasing density of housing provision as the site moves from the central high ground towards the north and north east;

High Quality Walking Environment

- A perimeter block layout ensures that buildings are oriented to address the street, create continuous street frontages and well-defined spaces and offer good levels of natural surveillance. These serve to enhance the pedestrian experience;
- The proposed grid structure is modified by offsetting street junctions to create shorter and more enclosed streets with buildings positioned to terminate the street view and create a more intimate and comfortable spatial network;
- At corner locations, both street frontages will be addressed as far as possible by constructing specific 'corner house' types/ designs; and
- The built form hierarchy is reinforced to create a more legible environment by focussing higher densities - more continuous building frontages, more frequent street junctions and where appropriate greater building heights - along the central routes and the lower densities/ more dispersed housing within less accessible outer areas;

High Level of Connectivity

- The proposed modified street grid structure optimises pedestrian permeability and dispersal of traffic, and limits the creation of no through routes/ cul-de-sacs;
- Direct and convenient pedestrian/ cycle routes are proposed into and across greenspaces, and connecting to the Core Path network surrounding the site; and
- Ensuring safe and convenient routes to the new school from surrounding neighbourhoods by positioning the school close to the Village centre;

Quality Greenspace Network

- The proposed greenspaces are highly accessible by all modes of transport and form an integral part of the public space network;
- Strategic landscaped greenspace is proposed around the perimeter edges of the site. This will serve to mitigate the visual impact of development and to tie in with the surrounding landscape framework;
- Green corridors branch from the central park area towards the edges of the site. These will offer connections to the greenspace network within the site promoting access across the site as whole. The green corridors will also provide a buffer between the proposed Village Hub and residential areas;
- As far as possible development will front on to the proposed greenspaces so that no space is 'hidden' from view;
- Key landscape features – the central ridge, the eastern tree line and the northern burn – will be retained as prominent parts of the proposed greenspace network. Footpaths along the ridge in particular will offer attractive and distant views over the countryside towards both Edinburgh, Arthurs Seat and the Pentland Hills; and
- SUDS basins will be fully integrated into the proposed greenspace network, without creating barriers to access;

Housing Variety and Mix

- A mix of housing types and sizes are proposed to cater for a balanced mix of households;

- A greater density of housing will be located towards the centre of the site close to connections and along the principal bus route, while lower densities will be focussed to the peripheral parts of the site; and
- A minimum of 25% of housing will be for affordable homes of various types and tenures, including special needs housing close to bus and local services;

4.6 Alternatives Considered

The production of the Development Masterplan and decisions on project elements that form the proposed development has been an iterative process during which a number of alternative designs have been considered for the proposed development. Technical studies have informed the decision making – comments on potential environmental considerations are provided below.

Alternative / Option Considered	Comments – including environmental constraints
Strategic Alternatives	
The 'Do-Nothing' – No development on site – no development of additional residential units, associated community and greenspace uses.	• Does not contribute to the SESplan allocations to provide a total of 48,000 houses phased over a period 2024 to 2032 on sites within the Edinburgh LDP area; • Does not contribute to strategic and local junction improvements, including the A71 / Dalmahoy Road and associated junctions; • Site would not be managed to enhance environmental asset e.g. greenspace management, creating and encouraging public access etc;
Development of new community elsewhere – alternative site outwith Edinburgh	• Does not support the SESplan relative to housing allocations;
The Optimal / Preferred Development (approx 1,200 homes plus allocation for a new primary school, community hub, health centre, open spaces and strategic greenspace network)	• Development, through sensitive design, should maintain amenity in the surrounding area for pedestrians and cyclists as well as enhancing access to Core Paths and to the open countryside; • The provision of publicly-accessible open space as part of a comprehensive landscape strategy – including strategic landscaped edge, green corridors and smaller local amenity greenspace, providing a variety of functional open spaces for the new community which enhances the amenity value and potential of non-vehicular types of travel; and • Consideration of environmental factors has been an integral part of the evolution of the Masterplan to ensure the framework addresses the potential for environmental enhancement and environmental impacts at all phases and stages of the development. Environment considerations have been addressed across a range of disciplines with the environmental assessment process specifically seeking to evaluate the potential significance of potential impacts and identify viable opportunity for mitigation and enhancement;
Detailed Alternatives	
Alternative street layouts, building massing and heights	• The development layouts were informed by a technical understanding of the site's constraints (particularly topography, environment, hydrology and landscape and visual considerations) to define developable land areas. Potential access opportunities, key views and other good practice urban design considerations (Designing Streets) informed the proposed greenspace framework and the street layout;

	• Access and connectivity of the proposed site with the surrounding road network and existing urban areas was analysed with the view that a dedicated vehicular egress point was essential to link e A71 and thus alleviate traffic at the existing junction with Dalmahoy Road; and • More detailed analysis of the key site interfaces revealed certain sensitivities including views to Edinburgh and the Pentland Hills. The layout was revised to extend greenspace within the central greenspace area and to move proposed housing considerably further from the site edge on the A71 to increase amenity value. These houses were also rotated to provide a more reserved frontage to the main road;

4.7 The Proposal

The Masterplan and the resultant proposed development has undergone several iterations and revisions to ensure that constraints, opportunities and consultation input have been addressed within the design.

This optimal development provides for the following scope:

- Residential development of approximately 1,200 homes;
- Village center comprising local retail, leisure, healthcare / community, transport hub and flatted residential properties;
- Site for Single Stream Primary School;
- Open space for landscaping, comprising a neighborhood park, linear parks, amenity space plus new and retained woodland;
- Surface water drainage infrastructure comprising wetland, retention ponds and bioswales;
- Roads infrastructure including upgraded a71 / Dalmahoy Road junction, new junction to east onto A71, upgraded / amended Dalmahoy Road including village square and new residential street network; and
- Footpaths / cycle paths including set back route adjacent to the A71 on the southern site frontage.

4.8 Conclusion

The Hatton Village proposal includes the significant development of a large greenfield site in a prime location to the west of Edinburgh.

The proposed development will develop a distinctive high-quality new community in which to live and work and will provide social and economic benefits to the surrounding area.

The scale of the development provides the opportunity to develop new residential neighborhood with strong links to existing residential areas and to Edinburgh.

Chapter 5

Environmental Assessment

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Chapter 5 Environmental Assessment

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5. Environmental Assessment

5.1 Environmental Impact Assessment

This Environmental Impact Assessment (EIA) has been undertaken in accordance with The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

The EIA of the proposed development has been undertaken as an integral part of the development's appraisal and design process. The objectives of the EIA process are to identify the likely consequences for the natural and human environment arising from the development and to consider these issues within the development planning and design process.

The process of EIA has therefore been used as a means of informing the decision-making process throughout the design to avoid potentially significant impacts where practicable and by embedding mitigation measures to reduce or offset any predicted, adverse environmental impacts.

This Environmental Assessment Report (EAR) documents the EIA process and records the predicted environmental impacts. The purpose of the document is to ensure that decision makers, statutory parties, technical specialists, non-statutory bodies with interests in the environment and local communities are fully informed of the proposals.

5.2 Content of the Environmental Assessment Report

The EIA Regulations (Part 1 of Schedule 4) requires the EAR to contain information that is "*reasonably required to assess the environmental effects of the development and which the applicant can, having regard in particular of current knowledge and methods of assessment, reasonably be required to compile*".

This compliance is presented in the table below

	Specified Information	EAR Location
1	Description of the development, including, in particular	
(a)	A description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases;	Chapter 3 (The Proposed Development) and Chapter 15 (Landscape & Visual).
(b)	A description of the main characteristics of the production processes, for instance, nature and quantity of the materials used; and	Chapter 3 (The Proposed Development)
(c)	An estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the development.	Chapter 3 (The Proposed Development)
2	An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for the choice made, taking into account the environmental effects.	Chapter 2 (Need for the Project) and Chapter 4 Consideration of Alternatives).
3	A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors.	All Technical Chapters (6 to 15).
4	A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects of the development, resulting from: • The existence of the development;	All Technical Chapters (6 to 15), Chapter 16: Residual & Cumulative Impacts.

	• The use of natural resources; and • The emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant or appellant of the forecasting methods used to assess the effects on the environment.	
5	A summary of the measures envisaged to prevent, reduce and, where possible, offset any significant adverse effects on the environment.	Chapter 17 (Summary and Schedule of Environmental Commitments).
6	A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.	Non-Technical Summary under separate cover
7	An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.	Chapter 5 (Environmental Assessment), technical chapters (6-13) where appropriate and the final chapter Summary and Schedule of Commitments (17)

Table 5.1 EAR Compliance

This EAR is divided into five parts, summarized below:

- Part One Chapter 1 – Introduction;
- Part Two Chapter 2 – Need for the Project;
- Part Three Chapter 3 – Project Description;
- Part Four Chapter 4 – Consideration of Alternatives; and
- Part Five Chapters 5 to 17 – Environmental Assessment.

5.3 EIA Screening

Clarendon Planning & Development (CPD) requested a screening determination from the City of Edinburgh Council (CEC) in June 2016 (Appendix A1).

The response from CEC in July 2016 concluded that, due to the environmental sensitivity of the location, along with the nature and frequency of the environmental impacts associated with the construction, operation and decommissioning of the proposal, the development should be subject to a full EIA. A completed checklist informed their decision (Appendix A2).

5.4 EIA Scoping

The next stage in the EIA process is scoping. The main purposes of scoping are:

- To focus the EIA on the environmental issues and potential impacts which require attention;
- To identify those areas which require detailed study; and
- To identify those areas which require no study;

The scoping exercise also provides early indications of mitigation measures which will be acceptable. These are consequently fed into the design process for the project.

A formal scoping request was submitted to CEC in September 2018. CEC responded in November 2018 with a Scoping Response (Appendix A3) and then provided remaining detail in an additional response also dated November 2018 (Appendix A4).

These key considerations were fed into the EIA process.

5.5 Consultations

The development proposal for the site has undergone an iterative process involving the project team and key stakeholders. Further detail on the consultation process is provided in the Planning Application Consultation (PAC) Report submitted as part of the Planning Application.

During the exercise, the following agencies and groups fed into the process.

Statutory Authorities and Agencies
The City of Edinburgh Council
West Lothian Council
Scottish Natural Heritage (SNH)
Scottish Environment Protection Agency (SEPA)
Historic Environment Scotland
The Coal Authority
Scottish Water

Table 5.2 Environment Consultation Bodies

Consultee responses are referred to within the text of the report, where appropriate, and copies of the responses to screening and scoping are provided in Volume 3, Appendix A.

5.6 Community Consultation

In addition to statutory EIA scoping, the Applicant has undertaken pre-application consultation.

Submission of a Proposal of Application Notice was made in June 2016, informing local Community Councils (Ratho, Balerno, Currie, Barnton & Cramond), local councillors, the Pentland Neighbourhood Partnership and the local community of the new village proposal.

Initial pre-application community consultation was held on behalf of the landowner in September 2016 with events advertised and held at both Ratho Community Centre and Heriot-Watt University's Riccarton campus. A separate meeting with Ratho Community Council was also held.

An overview of the planning and design context for the proposed development was provided along with initial indicative proposals setting out the concept of a new village.

The events were well attended with a range of discussion enabled on the merits of a new village proposal to accommodate part of Edinburgh's housing need. Much of the discussion focussed on infrastructure delivery and scope to accommodate growth on the A71 arterial route. Early improvements and mitigation of traffic impact was viewed as a key requirement along with ensuring local facilities were provided in early phases. The inter-relationship of the new village with Ratho was also debated with a need to ensure that there were benefits to off-set potential impacts.

Inverdunning (Hatton Mains) Ltd became the delivery partner/promoter for the Hatton Mains site in 2018 and an update was circulated to all community councils, local councillors and interested parties in October 2018. This set out the intention to undertake technical studies and prepare a masterplan to allow for promotion of the site via the emerging Local Development Plan in 2019 with potential public consultation in late 2018.

A further update was circulated in December 2018 noting that due to the close proximity of the planned Local Development Plan Main Issues Report consultation, it was considered that further public consultation would be delayed until after that formal process had been undertaken.

A draft masterplan was circulated to enable interested parties to see the design progress to date and a further meeting was held with Ratho Community Council to provide an update and discuss the emerging design. As outlined within the project updates, it is the intention to hold further public consultation into proposals from Summer 2020 onwards to allow for full consideration of the proposals as they are progressed through the Local Development Plan process.

5.7 Environmental Impact Assessment Methodology

5.7.1 General

This EAR has been prepared to comply, in all aspects, with The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

Recognition is also made of the guidance provided in SNH Handbook of Environmental Impact Assessment, 2013.

5.7.2 Aims

This EIA process has been conducted on the outline design proposals prepared by CPD. The aims of the Environmental Impact Assessment process is:

- to provide a detailed understanding of the environment of the proposal and its surroundings;
- to fulfil the information requirements listed in Schedule 2 of The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017;
- to ensure issues raised in Fife Council and Statutory Consultees scoping opinions are addressed;
- to identify potential environmental impacts associated with the proposed future development of the development itself and associated infrastructure;
- to provide a detailed assessment of those impacts likely to be significant; and
- to identify appropriate mitigation measures.

5.7.3 Effects Scoped Out

The following disciplines have been identified as insignificant with respect to the Development and are therefore not included in the EAR. An explanation for each discipline is provided below.

Daylight, Sunlight & Overshadowing

There are no residential buildings or other sensitive uses adjacent to the Site or close enough such that built massing on the Site could cause changes to daylight or sunlight availability or cause overshadowing of amenity space. This discipline has therefore been scoped out of the EAR.

Light Spillage and Solar Glare

The Development would not be constructed of highly reflective materials, which could cause solar glare effects. Solar glare has therefore been scoped out of the EAR.

The Landscape and Visual Impact Assessment within the EAR considers night time light spillage impacts as part of the assessment.

Electronic Interference

The Development is not high-rise and therefore unlikely to cause electronic interference. This discipline has therefore been scoped out of the EIA.

Wind (Microclimate)

The Development is not of a sufficient height or mass to lead to likely significant effects with respect to wind microclimate and the Development would not include areas of public realm where pedestrians would be vulnerable to significant wind conditions. Therefore, wind has been scoped out of the EIA.

5.7.4 Structure of Technical Chapters

Each technical chapter of the EAR (Chapters 6-13) has been set out broadly in line with Table 2.1 below.

Technical Chapter Structure	
Introduction	Each of the technical chapters begins with an introduction providing context to the EIA completed.
Policy Context	This section includes a summary of policies of relevance to the environmental discipline and explains its purpose in the context of the Development and the EAR.

Technical Chapter Structure	
Assessment Methodology & Significance Criteria	This section describes the method and approach employed in the assessment of likely significant effects, the criteria against which the significance has been evaluated, the sources of information used, and any technical difficulties encountered. Relevant legislation is also identified.
Baseline Conditions	This section describes and evaluates the baseline environmental conditions i.e. the current situation and anticipated changes over time assuming the Site remains undeveloped.
Likely Significant Effects	This section identifies the likely significant effects on the environment resulting from the Development during demolition, construction and operational phases. A description of the likely significant effects of the Development and an assessment of their predicted significance is provided.
Mitigation Measures	This section describes the measures which would be implemented to mitigate against potential adverse impacts. Where possible, enhancement measures have also been proposed.
Residual Effects	In this section, the residual effects, i.e. the remaining effects of the Development assuming implementation of the proposed mitigation measures, are estimated and presented.
Cumulative Effects	This section considers the cumulative effects of the Development with committed developments identified within the vicinity of the Site. Any likely significant effects on the environment arising in this respect are set out in this section.
Summary	Each technical chapter concludes with a brief summary outlining the potential residual effects for the construction (including demolition) phase (short/medium) and operational (medium/long-term) phase of the Development.

Table 5.3 Structure of Technical Chapters

5.7.5 Likely Significant Effects

The assessment of impact significance has been undertaken using appropriate national and international quality standards. Where no such standards exist, the judgments that underpin the attribution of significance are described. The guidelines, methods and techniques used in the process of determining significance of effects are contained within each of the technical chapters presented.

Magnitude

The methodology for determining the magnitude of effect is set out in Table 5.4.

Magnitude of Impact	Criteria for Assessing Effect
Major	Total loss or major/substantial alteration to key elements/features of the baseline conditions such that the post development character/composition/attributes will be fundamentally changed.
Moderate	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.
Minor	A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The

Magnitude of Impact	Criteria for Assessing Effect
	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.

Table 5.4 Methodology for Assessing Magnitude

Sensitivity

The sensitivity of a receptor is based on the relative importance of the receptor using the scale in Table 5.5.

Sensitivity	Examples of Receptor
High	The receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance.
Moderate	The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.
Low	The receptor/resource is tolerant of change without detriment to its character, is of low or local importance.

Table 5.5 Methodology for Assessing Sensitivity

Significance

The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the impacts can be positive or negative. Table 5.6 below shows how magnitude and sensitivity interact to derive effect significance.

Magnitude	Sensitivity		
	High	Moderate	Low
Major	Major Adverse/Beneficial	Moderate - Major Adverse/Beneficial	Minor - Moderate Adverse/Beneficial
Moderate	Moderate - Major Adverse/Beneficial	Minor - Moderate Adverse/Beneficial	Minor Adverse/Beneficial
Minor	Minor - Moderate Adverse/Beneficial	Minor Adverse/Beneficial	Negligible - Minor
Negligible	Negligible	Negligible	Negligible

Table 5.6 Method for Assessing Significance

The above magnitude and significance criteria have been provided as a guide for technical specialists to assess impact significance. Where discipline specific methodology has been applied that differs from the generic criteria above, this has been clearly explained within the given chapter under the heading of Assessment Methodology and Significance Criteria.

Mitigation

Any adverse environmental effects have been considered for mitigation at the design stage and, where practicable, specific measures have been put forward. Measures have been considered based on the following hierarchy of mitigation:

- Avoidance;

- Reduction;
- Compensation;
- Remediation; and
- Enhancement.

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

Mitigation recommended during the construction phase would be set out in the Construction Environmental Management Plan (CEMP) to be agreed with CEC prior to the commencement of work and implemented throughout the duration of the works.

Mitigation to be implemented during the operational phase would be secured through planning conditions and obligations.

Cumulative Effects

The EAR considers the potential for likely significant effects on the environment resulting from committed developments in the area coming forward at the same time as the Development. These include:

- Existing completed projects;
- Approved but uncompleted projects;
- Certain projects which are reasonably foreseeable, i.e. projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative effects.

A number of nearby proposed developments, which have the potential to lead to likely significant effects on traffic only, have been agreed with CEC and are included in the consideration of likely significant cumulative effects on transport effects. The developments that are considered within the assessment of cumulative interactions (Chapter 16) are shown in Table 5.7.

Planning Reference Number	Address	Description
16/05217/PPP	Riccarton Mains Village	Residential development of flats, affordable housing, neighbourhood centre and university halls of residence.
15/05100/FUL	Newmills Road, Balerno	Residential development of 206 houses and flats, formation of linear park, associated infrastructure and ancillary works
15/05224/PPP	Freelands Farm, Ratho	Proposed residential development (approximately 150 units) with associated works.

Table 5.7 Developments to be Considered Within Cumulative Assessment

Each technical chapter (Chapters 6-13) has assessed the potential for likely significant effects on the environment as a result of the above committed developments.

Residual Effects

The likely significant effects on the environment, assuming the successful implementation of mitigation measures proposed, have been identified within each chapter.

5.7.6 Assumptions and Limitations

The principal assumptions that have been made, and any limitations that have been identified in preparing the EAR, are set out in each technical chapter. General assumptions include the following:

- Assessments assume the baseline conditions at the time of EAR preparation (2020);
- It is assumed that current surrounding land uses do not change, with the exception of the committed development identified;

- Assessments are based on published sources of information and primary data collection. Sources are provided as necessary;
- Assessments are based on the description of development set out in Chapter 3 and the anticipated construction methodology and programme described in Chapter 5; and
- Assessments conclude the 'worst case' effects that would arise from the parameters described in Chapter 3.

5.7.7 Objectivity

The technical studies undertaken within the EAR have been progressed in a transparent, impartial and unbiased way with equal weight attached, as appropriate, to beneficial and adverse effects. Where possible, this has been based upon quantitative and accepted criteria together with the use of value judgements and expert interpretations.

The assessment has been explicit in recognising areas of limitation within the EAR and any difficulties that have been encountered, including assumptions upon which the assessments are based. Where appropriate, the assessment of significance has been given confidence levels.

5.8 Environmental Assessment of 'Scoped In' Topics

Those environmental topics that have been scoped in are further assessed in the following chapters of this report:

- Chapter 7 Socio Economics and Human Health;
- Chapter 8 Cultural Heritage;
- Chapter 9 Biodiversity and Ecology;
- Chapter 10 Soils and Geology;
- Chapter 11 Hydrology, Drainage and Flooding;
- Chapter 12 Air Quality;
- Chapter 13 Noise;
- Chapter 14 Transport
- Chapter 15 Landscape and Visual;
- Chapter 16 Residual and Cumulative; and
- Chapter 17 Summary and Schedule of Commitments.

These are supported with Technical Reports as appropriate. All Technical reports can be found in Volume 3 of this EAR.

5.9 Approach to Protection and Enhancement of Assets

Consideration of environmental factors has been a key driver in the development of the proposals. Work undertaken includes detailed site audits, consultation, species and habitat studies and environmental screening and scoping to ensure that all key areas of interest have been adequately covered by the EAR.

This approach seeks to secure a broad-based understanding of the opportunities and constraints associated with the site and the local area.

The proposed development addresses requirements for the protection and enhancement of environmental assets and the close integration of environmental, landscape and place-making objectives.

There are a number of environmental assets within and in the vicinity of the site that have been considered and will be protected and enhanced as part of the development proposal. Where impacts have been identified that cannot be addressed through alternative design / other measures, mitigation has been included within the specialist chapters.

Assessment of potential impacts and opportunities relative to these assets is provided within the specialist chapters of this EAR.

Environmental Asset	Relevant Chapter
Air Quality and Noise	Chapter 12 Air Quality Chapter 13 Noise Chapter 14 Transport
Local Biodiversity Interest – protection of wildlife and habitats	Chapter 9 Biodiversity and Ecology Chapter 15 Landscape and Visual
Historic environment – known and unknown cultural heritage sites	Chapter 8 Cultural Heritage Chapter 15 Landscape and Visual
Wider green corridors forming part of the habitat network across the site	Chapter 9 Biodiversity and Ecology Chapter 15 Landscape and Visual
Core Paths and public access	Chapter 15 Landscape and Visual
Water environment, surface water management and flooding	Chapter 9 Biodiversity and Ecology Chapter 11 Hydrology, Drainage and Flooding Chapter 15 Landscape and Visual
Existing landscape, green networks and trees	Chapter 9 Biodiversity and Ecology Chapter 15 Landscape and Visual
Local community	Chapter 7 Socio Economics and Health Chapter 9 Biodiversity Chapter 12 Air Quality Chapter 13 Noise Chapter 14 Transport Chapter 15 Landscape and Visual Chapter 16 Residual and Cumulative

Table 5.3 How Environmental Assets are assessed in the EAR

Chapter 6

Planning Policy

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Chapter Planning

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6. Planning

6.1 Introduction

This chapter sets assesses the proposal for Hatton Village against national, regional and local planning policy.

This chapter should be referred to in conjunction with the Planning Statement prepared in support of the proposal as well as the Main Issues Representation document.

Edinburgh is facing significant growth requirements over the next decade and faces a challenge in accommodating required housing land within a tightly defined urban boundary. This proposal sets out the planning merits of a new village to accommodate a significant contribution to this housing need over the plan period. In particular, this chapter provides an overview with regard to planning policy as it relates to potential development scope.

6.2 Site Context

Hatton Mains Farm landholdings extend to approximately 400 acres in total but, following an initial environmental, technical and planning policy review, an area has been identified of approximately 150 acres (as per the red line boundary on Figure 6.1). The site comprises existing arable farmland to the west of the city, south of Ratho and north of Balerno. This shows a potential for development west of the city's existing urban area.

The landholdings are bound by the A71 and Gogar Burn to the south and the former Hatton House estate to the west with further agricultural land extending to north and east including a range of woodland and field boundaries.

The land has a generally southerly aspect and is bisected by a minor road extending in a north-south direction between Ratho and the A71 and Dalmahoy (which extends to the south).

6.3 Planning Policy Context

6.3.1 National Planning Policy

National planning policy provides the framework within which planning authorities are to assess development proposals and are key material considerations, as detailed within

- National Planning Framework 3 *(NPF3; Scottish Government, June 2014);* and
- Scottish Planning Policy *(SPP; Scottish Government, June 2014)*.

These key policy documents set the context for regional and local planning in Scotland and are key material considerations in the determination of any planning application. Both documents are currently under review following approval of the Planning (Scotland) Act 2019 and a new National Planning Framework 4 (which will combine both documents) is expected to be published in draft later in 2020.

NPF3 highlights the need to implement a development strategy which supports growth of existing communities and creates sustainable patterns of travel and land-use, whilst balancing existing character, built and natural assets. This need is at its greatest in South East Scotland, with NPF3 highlighting the need to *"see greater and more concerted effort to deliver a generous supply of housing land in this area"* (p.13) with Edinburgh the key service centre.

This approach is supported by SPP (Para. 28 & 29) which, *"introduces a presumption in favour of development that contributes to sustainable development"* and revisions to SPP provide the context for bringing forward larger scale proposals to meet significant land supply issues.

SPP Paragraphs 53 & 54 outline the Government approach to the creation of new settlements:

"The creation of a new settlement may occasionally be a necessary part of a spatial strategy, where it is justified either by the scale and nature of the housing land requirement and the existence of major constraints to the further growth of existing settlements, or by its essential role in promoting regeneration or rural development"

"Where a development plan spatial strategy indicates that a new settlement is appropriate, it should specify its scale and location, and supporting infrastructure requirements, particularly where these are integral to the viability and deliverability of the proposed development. Supplementary guidance can address more detailed issues such as design and delivery".

The provisions of SPP require that any proposal is assessed in terms of identifying any adverse impacts that would *"significantly and demonstrably outweigh the benefits"* when assessed against the wider policies of SPP, including:

- National outcomes in relation to creating places which are *well designed, sustainable, low carbon, connected and resilient places.*
- Sustainability Policy; net economic benefits, responding to economic issues, challenges and opportunities, supporting good design, supporting local centres, potential to improve viability and sustainability of local transport and service provision, no adverse impact upon flood risk, cultural or natural heritage assets, opportunity for improving health and well-being through access to recreation.
- Placemaking Policy; meet the key qualities of creating a successful place and being located in the right place in terms of context and demand, a sensitive, contextual development in line with Government policy including *Creating Places (2013)* and *Designing Streets (2010)*.
- Housing Policy; the proposal contributes to the effective housing land supply and create range and choice.
- Historic Environment Policy; no adverse impact upon the historic environment, subject to suitable design and landscape treatment.
- Natural Environment Policy; no adverse impact on landscape character.
- Green Infrastructure Policy; design and landscaping allowing for integration of the site.
- Flood Risk & Drainage Policy; no flood risk and suitable SUDS and drainage impact.
- Sustainable Transport Policy; increase in vehicular movement can be mitigated with public transport, walking and cycling prioritised.

Overall, in terms of SPP, the proposal for a new stand-alone settlement at Hatton Village could be promoted in line with existing policy to meet housing land requirements via the Local Development Plan process.

As detailed within the main Representation document which accompanies this application, the housing land supply basis for bringing forward a large-scale proposal can be justified and with a suitable infrastructure and design approach, the proposal could constitute sustainable development with no adverse impact which would "significantly and demonstrably" outweigh the benefits delivered.

6.3.2 Development Plan

The Development Plan, which comprises the approved Strategic Development Plan for Edinburgh and South East Scotland *("SESplan",* approved 2013 with *Supplementary Guidance on Housing Land* approved 2014*)* and the Edinburgh Local Development Plan *("LDP",* adopted in 2016).

SESplan is now technically out of date, being more than five years old in line with SPP, but still provides the broad spatial context for assessing development proposals at this time. A Proposed SESplan was published in 2016 but was rejected by Scottish Ministers in May 2019 and given the strategic development plans were abolished under the 2019 Act, a replacement will not be produced. However, the SESplan authorities are working together to prepare a new Regional Spatial Strategy under the 2019 Act provisions although this is unlikely to be available until 2021 at the earliest.

6.3.3 Housing Land Requirements

The main Representation document addresses housing land requirement in the context of Edinburgh's proposed options to cover the new Local Development Plan period up to 2032.

In summary, if utilising the 2015 Housing Need and Demand Assessment, there is a need to identify land for between 17,600 and 27,900 new homes (net of existing land supply) depending on which option is preferred.

The Choices for City Plan 2030 document has a preferred option which provides for all new housing within the existing urban area, with alternatives including either a 100% greenfield option or a combined urban/greenfield approach.

As set out in the Representation document, whichever methodology is applied, there is a need for a significant level of housing land which will require to include greenfield sites if the housing demand and growth aspirations are to be met. This provides the justification for a new village proposal as outlined in this document.

6.3.4 SESplan Spatial Policy

SESplan Policy 1A sets out existing spatial policy with West Edinburgh identified as a Strategic Development Area based upon existing and planned transport infrastructure and employment opportunities. The boundaries of the West Edinburgh growth area do not extend south of the A8 at present, which is reflected at LDP level with significant housing allocations proposed at Gogar, South Gyle, Maybury and Cammo.

The Proposed SESplan 2 (prior to rejection) identified the A71 corridor as a long term growth area (see Figure 3 on Page 7) whilst the on-going West Edinburgh Study (referred to within Choices for City Plan 2030) identifies a wider West Edinburgh area to investigate where key infrastructure can be best implemented to support LDP growth requirements. The Hatton Village site is located within this West Edinburgh Study search area and provides scope for significant growth outwith current Strategic Development Area boundaries.

SESplan Policy 7 sets out the criteria by which greenfield sites should be assessed to allow for new sites to come forward to address an identified land supply shortfall. These criteria relate to impact on existing settlement/area character, impact on Green Belt objectives and the need for any additional infrastructure required to be either committed or funded by the developer.

Hatton Village would form a new settlement which, as set out within supporting documents including an Environmental Impact Assessment, could be implemented without any significant adverse impacts upon either the Edinburgh Green Belt or infrastructure, subject to suitable funding contributions.

6.3.5 LDP Designations

The Hatton Village site is currently protected by Policy Env10 - Green Belt.

SESplan Policy 12 (Green Belts) sets out the key criteria to be achieved, being:

a) Maintain the identity and character of Edinburgh and Dunfermline and their neighbouring towns, and prevent coalescence, unless otherwise justified by the local development plan settlement strategy;
b) Direct planned growth to the most appropriate locations and support regeneration;
c) Maintain the landscape setting of these settlements;
d) Provide opportunities for access to open space and the countryside.

As a stand-alone development, the proposal at Hatton Village would create its own definition in terms of place character and would therefore be a positive approach in terms of remaining separate from Edinburgh. It is therefore considered criteria (a) could be addressed as a fully-planned new settlement.

This would also be the case with criteria (b), on the basis that the proposal can be supported by the City of Edinburgh Council as a suitably located new settlement to address the growth strategy requirements.

Criteria (c) in relation to maintaining Edinburgh's landscape setting is addressed within this EAR (Chapter 15 and Appendix J) and the proposed design and landscape approach at Hatton Village ensures impact from key views is mitigated.

Overall, the creation of a new settlement at Hatton Village would assist with maintaining the original purpose of the Edinburgh Green Belt by retaining separation between the City and a new growth area.

Figure 6.2 identifies the adjoining policy designations which would require to be taken into account in any planning and design proposal, including:

- Policy Env11 - Special Landscape Area (SLA) (Ratho Hills - west of site)
- Policy Env7 - Historic Gardens and Designed Landscapes (Hatton House - south-west of site)
- Policy Env15 - Sites of Local Importance (Gogar Burn - Local Nature Conservation Site - south-west of site)
- Policy Env7 - Historic Gardens and Designed Landscapes (Dalmahoy - south of site)

Notwithstanding the site's Green Belt policy designation, there are no other protective designations affecting the site whilst adjoining designations have been fully assessed via landscape, heritage and design assessments supporting this proposal. The supporting Environmental Impact Assessment demonstrates that the new village proposal would have no significant adverse impacts upon these designations.

6.4 LDP Policies – Key Issues

6.4.1 Transport & Accessibility

Fundamental to the success of any proposal at Hatton Village would be an integrated approach to transport and accessibility given the new settlement approach.

National, strategic and local planning policy all require priority of public transport (plus walking and cycling) over private car use.

To facilitate new development at Hatton Village, a comprehensive approach is required to be inter-linked with a design and infrastructure framework. This must also clearly be a commercial approach where transport infrastructure costs are viable to deliver the project within LDP timescales.

Hatton Village is well connected with West Edinburgh transport infrastructure and employment / business centres. The supporting Transport Assessment outlines a public-transport focused approach with a new village hub serving the new community which will be able to access existing and enhanced bus services along the A71 and north via Ratho and enable connection to existing key centres. Walking and cycling connections can be improved including the site's contribution to the existing A71 cycling super-highway proposal.

As denoted on the adjoining 'connections' plan, there is scope for linkage between Hatton Village with Hermiston Park & Ride, Edinburgh Park Rail Station, Edinburgh Park/Gyle Business/Retail and the (new) Gogar Rail & Tram Station Interchange along with existing catchment schools.

As set out within the main Representation document, the site does not require to rely upon Edinburgh's longer-term aspiration of extension of the tram network. Utilisation and enhancement of the existing bus service routes (with scope for bus rapid transit along the A71) can serve the new village and ensure it forms a sustainable development proposal.

The proposal could address key transport and delivery policies including Tra 1-4 and 8-9 and Del 1 through agreement of suitable financial contributions to upgrades as outlined within the supporting Transport Assessment.

6.4.2 Landscape & Heritage

The site itself is not subject to specific landscape or historic environment restrictive designations.

However, the wider Green Belt designation and adjoining protected landscape areas are addressed in design and development proposals. Additionally, the proposals take into account adjoining historic environment designations including the former Hatton House grounds to the south-west and Listed Buildings in the Dalmahoy locality.

LDP policies Env3 (Listed Buildings), 7 (Historic Gardens and Designed Landscapes), 8/9 (Archaeology), 12 (Trees), 15 (Sites of Local Importance), 16 (Species Protection), 21 (Flood

Protection) and 22 (Air, Water and Soil Quality) are all addressed within the Environmental Impact Assessment which demonstrates the deliverability of the proposal.

6.4.3 Character & Design Quality

As a new settlement, Hatton Village would be able to create its own identity in terms of place and character. Due to this it would be able to remain separate from Edinburgh and surrounding towns.

The proposal will incorporate new infrastructure such as a new community/education facilities (primary school proposed but subject to further discussion with City of Edinburgh Council), green space as well as a local neighbourhood centre.

These amenities will provide Hatton Village with its own identity as well as provide essential local and accessible services.

The proposal provides an opportunity to design a twenty-first century community linked based on key concepts of climate change, energy efficiency, healthy living and creation of an welcoming and attractive place to live and work. The supporting design proposals outline a new village based upon a community and transport hub which would form a focus and combine work space, local services/amenities, gathering space, public transport and cycling hub links. A range of housing is proposed from higher density to larger plots at the rural edge, reflecting an appropriate transition and variation all set within a strong landscape framework providing generous greenspace, sustainable drainage provision and a range of useable space.

Masterplan density allows for a range of housetypes and takes into account the 'village' nature of the proposal with an indicative density of 35 dwellings per hectare providing for a total of around 1,200 homes. However, should higher density be required in part, there is scope for greater numbers on the basis that proposed infrastructure improvements are proportionally addressed.

The proposal **can meet the aspiration** of the following LDP design policies: Des 1, 3, 4, 5, 6, 7 and 8 and LDP housing policies Hou 2 (mix), 3 (private greenspace), 4 (density), 6 (affordable housing) and 10 (community facilities).

6.5 General Site Analysis

The site is not subject to fluvial flood risk with minor surface water drainage flood risk. Options exist for surface water drainage connections into adjacent watercourses.

Also, the site is not subject to specific features of historic importance with identified heritage assets out with the site boundary including the Hatton House grounds access in the south-west corner and Listed buildings to the south of the site with Dalmahoy landscape beyond.

The site is within a general Class 2 agricultural land classification (prime). However, this 'prime' land designation covers many of the allocated housing sites including Cammo and Maybury and is not viewed as an insurmountable issue where housing requirements and land quality requires to be balanced.

6.6 Conclusions

6.6.1 Planning & Spatial Policy

Scottish Planning Policy does support the creation of new settlements in the right circumstances and the political and administrative 'push' for development growth provides the platform at the national level to instigate such a proposal.

At the strategic level, existing policy supports growth areas based on public transport corridors and West Edinburgh will continue to remain one of the key areas for growth, as outlined in the emerging West Edinburgh Study, which identifies the A71 corridor specifically.

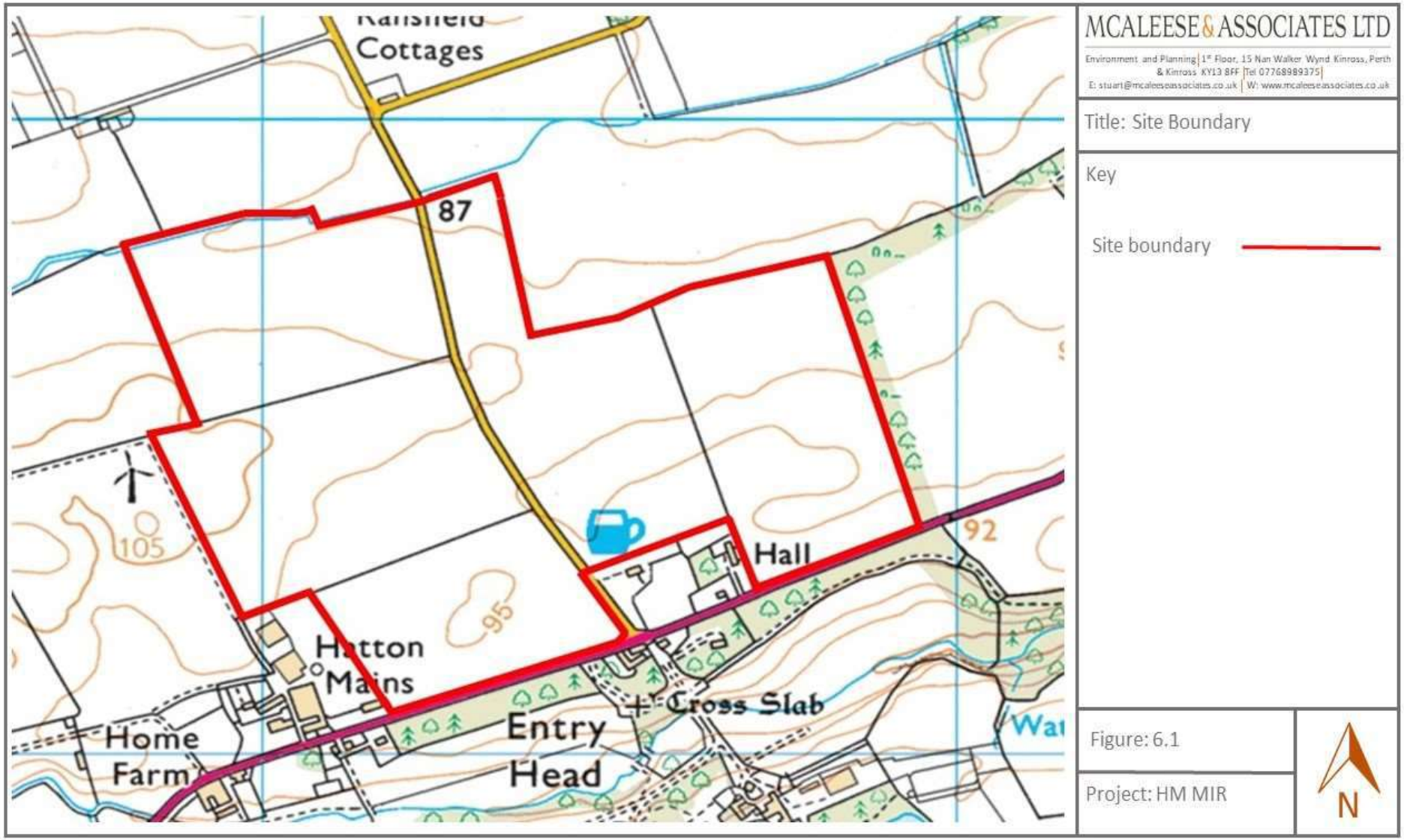
At the local level, the Choices for City Plan 2030 consultation has identified a need for a significant level of new housing. A combined approach to delivering this housing is required, utilising appropriate urban and greenfield sites. The majority of greenfield sites being promoted within

Edinburgh and extensions of existing communities with the associated political resistance due to strain on infrastructure and 'piecemeal erosion' of Green Belt.

Hatton Village provides the opportunity for a distinct new settlement option for City of Edinburgh Council to consider as a means to contribute to growth requirements.

The full suite of supporting documents including Environmental Impact Assessment, Transport Assessment and design proposals outline how Hatton Village can be delivered in terms of infrastructure requirements. As illustrated above, the site is well connected to West Edinburgh's key transport and employment hubs and there is potential to feasibly link to these existing features without excessive infrastructure costs within the LDP timeframe.

The proposal can also provide a high-quality sustainable design and landscape approach to mitigate perceived impact upon adjoining designations.


Cottages
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105
95
92
Hall
Hatton Mains
Home Farm
Entry Head
Cross Slab
MCALEESE & ASSOCIATES LTD
Environment and Planning | 1st Floor, 15 Nan Walker Wynd Kinross, Perth & Kinross KY13 8FF | Tel 07768989375
E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
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Site boundary
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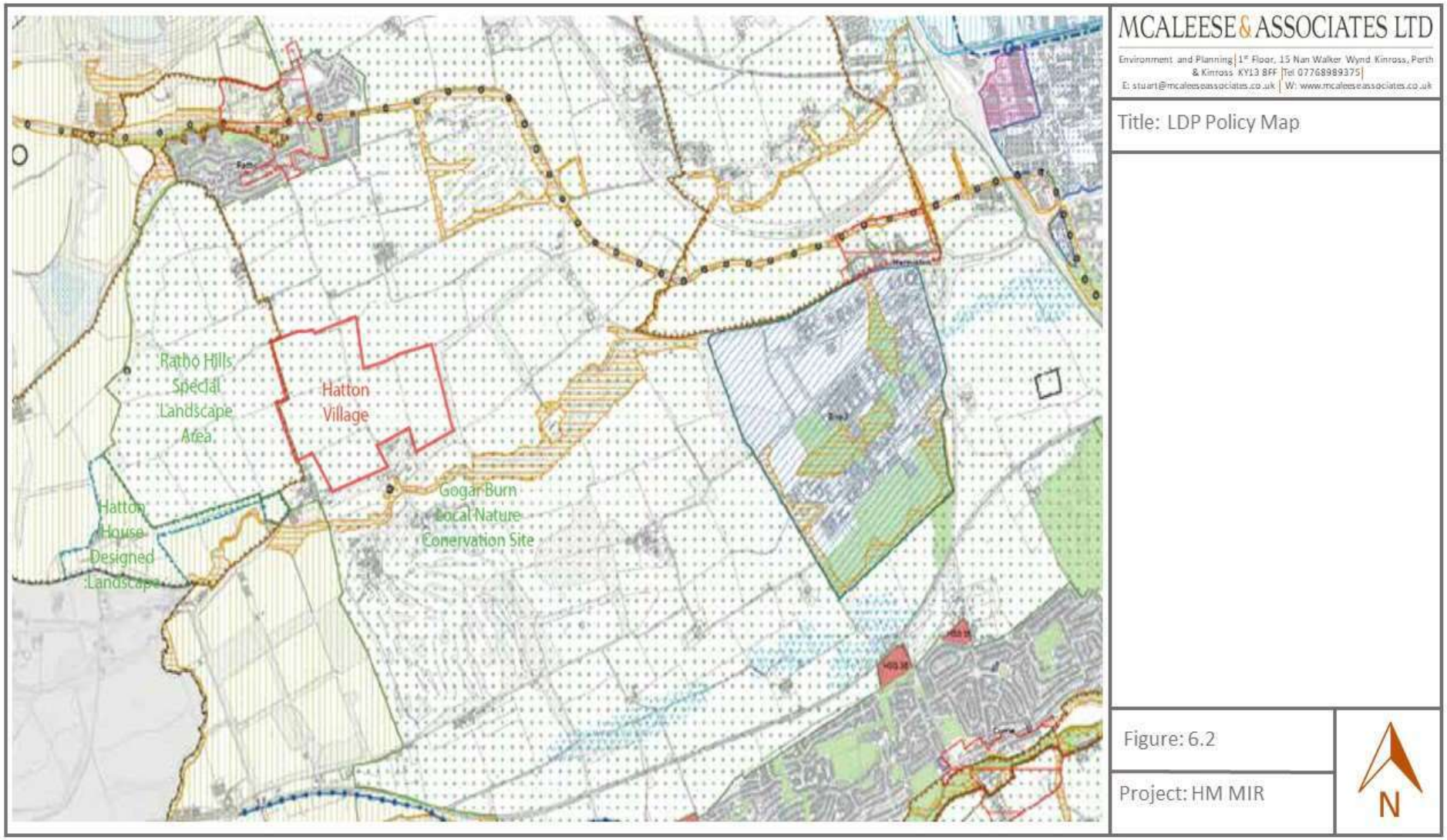
Ratho Hills Special Landscape Area
Hatton Village
Gogar Burn Local Nature Conervation Site
Hatton House Designed Landscape
MCALEESE & ASSOCIATES LTD
Environment and Planning | 1st Floor, 15 Nan Walker Wynd Kinross, Perth & Kinross KY13 8FF |Tel 07768989375|
E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
Title: LDP Policy Map
Figure: 6.2
Project: HM MIR
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Chapter 7

Socio Economics and Human Health

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Chapter 7 Socio Economics and Human Health

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7 Socio Economics and Human Health

7.1 Introduction

7.1.1 Introduction

This chapter of the EAR assesses the likely significant socio-economic and human health effects of the Proposed Development on the local population.

7.1.2 Legislative Context

National Planning Framework 3

Scotland's Third National Planning Framework (NPF3) is the spatial expression of the Scottish Government's Economic Strategy, setting out a long-term vision for development and investment across Scotland over the next 20 to 30 years. Sustainable economic growth underpins the strategy of which the vision is to create a successful, sustainable place; a low carbon place; a natural, resilient place; and a connected place.

The NPF3 recognises that the financial climate has reduced the amount of new housing built in recent years. In the coming years, the Scottish Government wants to see a significant increase in house building to ensure housing requirements are met across the country.

The strategy aims to ensure that planning will help create high quality, diverse and sustainable places that promote well-being and attract investment. The NPF3 states how flexibility is required to allow for different approaches to housing provision that respond to varying local requirements.

The spatial strategy sees Scotland's seven distinctive cities, together with their surrounding regions, as a focus for investment.

The city region of Edinburgh and the South East (in which the Proposed Development is located) is seen as having good prospects for growth, and the NPF3 states that it wishes to see a greater and more concerted effort to deliver a generous supply of housing land in this area. Glenrothes is considered one of the hubs for employment and services across the region.

Throughout the city regions the NPF3 recognises the need to ensure a generous supply of housing land in sustainable places where people want to live, providing enough homes and supporting economic growth.

Scottish Planning Policy

SPP sets out policy that will help to deliver the objectives of the NPF3 with a focus on plan making, planning decisions and development design.

SPP states that planning should take a positive approach to enabling high-quality development and making efficient use of land to deliver long-term benefits for the public while protecting and enhancing natural and cultural resources.

SPP introduces a presumption in favour of development that contributes to sustainable development which includes: giving due weight to economic benefit; and supporting delivery of accessible housing, business, retailing and leisure development.

SPP recognises that house building makes an important contribution to the economy and states that provision for new homes should be made in areas where economic investment is planned or there is a need for regeneration to support population retention.

There is a requirement for local development plans to allocate appropriate sites to support the creation of sustainable mixed communities and successful places and help to ensure the continued delivery of new housing, including affordable housing.

7.1.3 Scope of Assessment

The Site is located in greenbelt to the west of Edinburgh. Hatton Village is a new village and as such, there is not an existing population to assess. Consequently, data has been located as relates to the City of Edinburgh (for a local population), West Lothian (for a regional population) and Scotland (for a national population).

As the Proposed Development comprises primarily residential uses, the following factors have been included in the assessment of likely significant effects:

- Construction phase employment generation;
- Changes in population numbers and structure once the Proposed Development is operational;
- Changes in levels of local expenditure following completion;
- Changes in employment opportunities following completion; and
- Demands on primary healthcare and on primary and secondary education infrastructure once operational.

Construction phase effects on education and healthcare have been scoped out of the assessment as it is expected that the construction workforce and their families would use facilities near their place of residence. Effects are not anticipated to be significant.

The assessment comprises the following stages:

- Identification of baseline conditions with respect to these topics using information and statistics available in the public domain;
- Assessment of likely significant effects of the Proposed Development on the environment by reviewing the baseline conditions and determining the change attributable to the Proposed Development using published formulae and guidance to assess effects;
- Recommendation of mitigation or enhancement measures if necessary; and
- Assessment of residual effects assuming implementation of the mitigation/enhancement measures.

Population

Existing baseline conditions have been informed by the outputs from Scotland's Census 2011 and through reference to the National Records of Scotland (NRS), 2014-based Population Projections for Scottish Areas, these being the most up-to-date projection series at the time of writing.

Housing

Existing baseline conditions have been informed by outputs from Scotland's Census 2011.

Employment

The likely number of jobs generated during the construction phase has been assessed based on the HM Treasury Green Book assumption that £150,000 of construction expenditure equals one FTE position.

Primary Healthcare

General Practitioners (GP) Practice provision has been identified within proximity of the Site;

The number of dental practices within proximity of the Site (based on the same catchment area as GP Practices) has also been investigated.

The number of future residents that could live on the Proposed Development (which is calculated using household size statistics) is then compared to the levels of capacity within the primary healthcare system to determine whether or not the existing provision will be able to accommodate the needs of the Proposed Development. To ensure a 'worst case' scenario is considered, it will be assumed that all residents of the Proposed Development will be new to the area and therefore not already registered with local health practitioners.

Education

An Education Impact Assessment has been undertaken by Pegasus Consulting Ltd. It accompanies the MIR. All information within this EAR is taken from it.

All Primary and Secondary schools identified by FC's Education Service included within this assessment. The assumption has been made that all pupils generated by the Proposed Development would enter mainstream state-run schools, which is the 'worst case' scenario for assessment of school capacity.

7.1.4 Determining the Significance of Effects

There are no technical significance criteria relating to assessment of socio-economic effects on human populations other than those that relate specifically to other technical areas such as pollution, noise etc. and these are dealt with in separate EAR chapters, if necessary. The significance of socio-economic effects is therefore assessed using professional judgement in line with the outline methodology for determining sensitivity and magnitude of effects within Chapter 5 'Environmental Assessment'.

Quantitative calculations have been undertaken where possible e.g. surplus or deficit of pupil places and comparative GP to patient ratios, and the level of significance determined by the effect at either local, council or national level. Where it is not possible to measure effects on a quantitative basis, a qualitative assessment is provided. Those effects which are considered to have a minor, moderate or major effect have been considered as significant and where effects have been established as significant adverse, appropriate mitigation measures have been identified.

7.1.5 Reference Reports

His chapter of the EAR should be read in conjunction with the following:

- Appendix B1: Socio Economic Assessment (McAleese & Associates (UK) Ltd);
- Appendix B2: Rapid HIA (McAleese & Associates (UK) Ltd); and
- Education Impact Assessment (Pegasus Consulting Ltd).

7.2 Socio Economic Assessment

7.2.1 Introduction

This report presents a socio-economic baseline review at three geographic levels:

- City of Edinburgh (the area within which the development is located);
- West Lothian (for comparison of trends at a regional level); and
- Scotland (for comparison of trends at a national level).

7.2.2 Baseline Socio Economic Profile

The 'local area' of Hatton Mains has been defined using data for the city of Edinburgh.

Population

The total population of Edinburgh in 2012 was 482,600 people. This marked an increase of 30,600 (+6%) on 2017 – a greater rate of increase than at both the regional and national levels (at + for west Lothian +2% nationally - Table 7.1).

Area	2012	2017	% change
Edinburgh	482,600	513,200	+6%
West Lothian	176,000	181,300	+3%
Scotland	5,313,600	5,424,800	+2%

Table 7.1: Population Change 2012 and 2017[1]

The age structure varies across each area. Within Edinburgh there are a higher proportion of working age residents, matched by a lower proportion of children and people of pensionable age than nationally. West Lothian has a higher proportion of children than the national average with a lower proportion of pensioners (Table 7.2).

Area	Total Population	Children	Working Age	Pensionable Age
Edinburgh	513,200	15%	70%	15%
West Lothian	181,300	20%	64%	16%
Scotland	5,424,800	17%	64%	19%

Table 7.2: Age Structure 2017[2]

[1] Source: ONS mid-year population estimates.

[2] Source: National Records of Scotland, Area Profiles

Edinburgh is projected to have a higher change in children (7.2%) than the national average (2%) coupled with a higher increase in people of working age (2%). West Lothian is projected to have a higher increase in people of working age (3%) and pensionable age (22%) than nationally.

The population of Edinburgh and West Lothian is projected to grow over twice that nationally by 2026 (Table 7.3). These two areas would add another 47,623 people over ten years, roughly 4,800 people each year.

Residential developments will be required to facilitate the projected growth of children and working age, as well as those of pensionable age in the wider area.

Population Projections		2016	2026	% Change
Edinburgh	Children	77,364	83,376	7.2%
	Working Age	358,373	371,798	3.6%
	Pensionable Age	75,933	91,270	16.8%
	Total	511,670	546,444	6.4%
West Lothian	Children	35,307	35,330	0.1%
	Working Age	116,181	120,068	3%
	Pensionable Age	28,642	36,581	22%
	Total	180,130	191,979	6%
Scotland	Children	915,917	931,675	2%
	Working Age	3,489,931	3,457,739	-1%
	Pensionable Age	998,852	1,189,408	16%
	Total	5,404,700	5,578,822	3%

Table 7.3: Population Projections 2016 and 2026[3]

Housing

Housing tenure in West Lothian is similar to that nationally. However, Edinburgh has almost twice proportion of private rented and third less social rented accommodation.

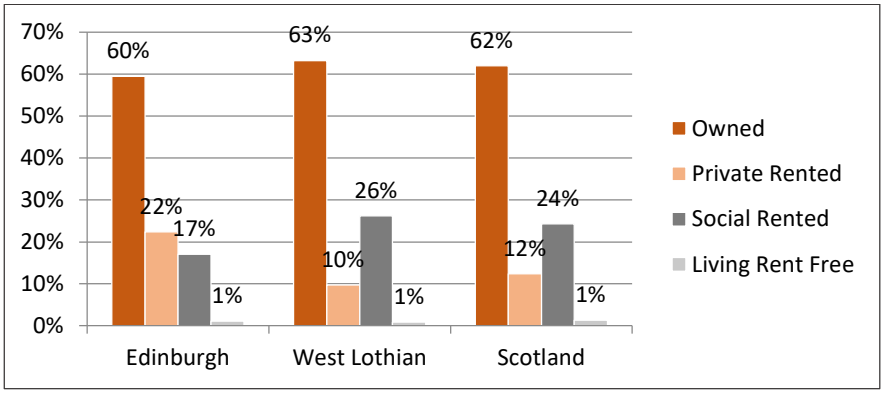

Figure 7.1: Housing Tenure, 2011[4]

The development proposal will deliver up to 1.200 new properties, 25% of the development (300 units) will be affordable housing.

From 1993 to 2017, the average house price in Edinburgh was consistently higher than both West Lothian and across Scotland. Edinburgh has had a consistently higher mean house price which has

[3] Source: National Records of Scotland, Population Projections

[4] Source: 2011 Census Data

now diverged £80,000 higher than the national average, and roughly £100,000 higher than West Lothian (Figure 7.2).

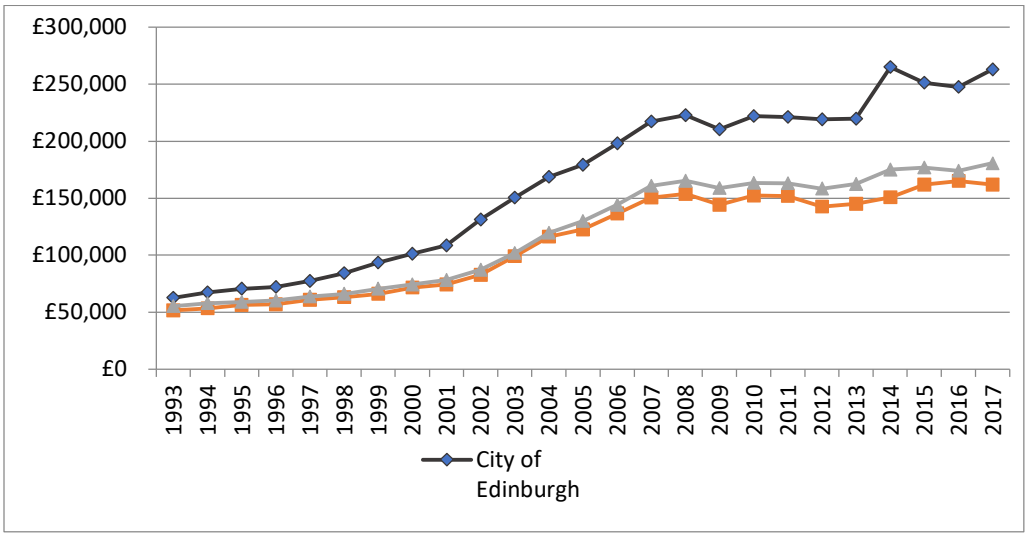

Figure 7.2: Mean House Prices, 1993 to 2017[5]

There is a high percentage of flats in Edinburgh, with 68% in Flats – this is different to both West Lothian and Scotland; where there is a much more uniform pattern of housing type (Figure 7.3). The proposed development is expected to deliver a mix of detached, terraced semi-detached, as well as some flatted development.

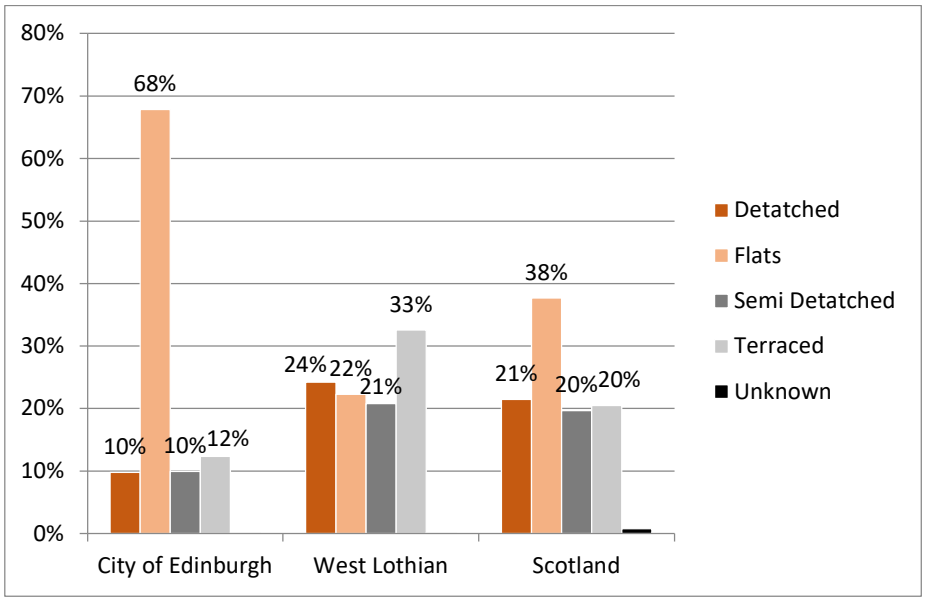

Figure 7.3: Housing Type, 2017[6]

Edinburgh has a slightly more uniform distribution of council tax bands than West Lothian and Nationally. Both West Lothian and Scotland have a similar distribution with nearly two-thirds within council tax bands A-C (Figure 7.4).

[5] Source: Scottish Government Statistics

[6] Source: Scottish Government Statistics

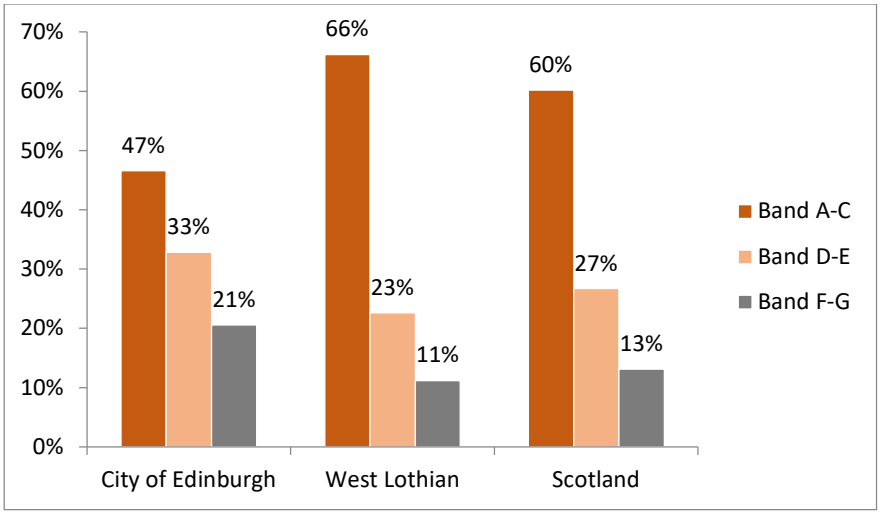

Figure 7.4: Council Tax Band, 2017[7]

Employment

Employment in Edinburgh has slightly increased in two years from 2015 to 2017 in line with the national average. Mining and quarrying in Edinburgh has seen the biggest change in the two years growing 50%. Agriculture in Edinburgh has seen a change of -33% much lower than the national average of +13% (Table 7.4).

Agriculture has followed a similar pattern in West Lothian with a change of -25%. West Lothian has seen a slight decrease overall, compared to nationally: largely due to change in agriculture and other services and significant drop in construction.

Sector	Edinburgh	% change	West Lothian	% change	Scotland	% change
Agriculture, forestry and fishing	300	-33%	400	-25%	40,000	13%
Mining and quarrying	200	50%	100	0%	31,000	-10%
Manufacturing	8,000	0%	8,000	13%	183,000	2%
Electricity, gas, steam and air conditioning supply	1,750	0%	0	0%	18,000	0%
Water supply; sewerage, waste management and remediation activities	1,500	0%	300	0%	19,000	11%
Construction	9,000	11%	5,000	-60%	140,000	6%
Wholesale and retail trade; repair of motor vehicles and motorcycles	37,000	0%	15,000	0%	351,000	-2%
Transportation and storage	11,000	0%	4,500	11%	107,000	5%
Accommodation and food service activities	31,000	0%	3,500	-14%	190,000	-7%
Information and communication	17,000	12%	5,000	10%	68,000	9%
Financial and insurance activities	33,000	-6%	700	0%	83,000	-2%
Real estate activities	4,500	-11%	600	0%	32,000	3%

[7] Source: Scottish Government Statistics

Professional, scientific and technical activities	29,000	3%	4,000	0%	169,000	4%
Administrative and support service activities	25,000	0%	7,000	14%	191,000	4%
Public administration and defence; compulsory social security	22,000	14%	5,000	0%	157,000	6%
Education	31,000	3%	4,500	0%	194,000	1%
Human health and social work activities	49,000	-2%	9,000	0%	400,000	-3%
Arts, entertainment and recreation	11,000	0%	2,000	13%	70,000	6%
Other service activities	6,000	17%	900	-39%	45,000	7%
Total	327,250	0.6%	75,500	-0.8%	2,488,000	0.5%

Table 7.4. Employment, 2017 and change since 2015[8]

Table 7.4 presents sectoral share of employment in West Lothian and Scotland, compared to Edinburgh. This is calculated by taking the percentage of total area employment within each sector and comparing it to the other comparator regions.

Edinburgh has less representation in Agriculture, Mining and quarrying, manufacturing, construction and Wholesale and retail trade; repair of motor vehicles and motorcycles. This is coupled with a greater proportion of Accommodation and food service activities, Financial and insurance activities and Professional, scientific and technical activities (Table 7.5).

This sectoral share works on a 'traffic light system', as follows:

Green cells indicate that Edinburgh has a greater representation of employees in these sectors than the comparator area (+2% points or more).

Orange cells indicate that the difference whether positive or negative is between 2% and -2%, meaning the comparator area has a relatively similar proportion of its workforce in this sector.

Red cells indicate that Edinburgh has a lower share of employees in these sectors (-2% points or more).

[8] Source: Business Register and Employment Survey. *= disclosive data. In keeping with NOMIS guidelines, all date has been rounded to the nearest 100 before being published.

Sector	Edinburgh	W. Lothian	Scotland
A : Agriculture, forestry and fishing	0%	1%	2%
B : Mining and quarrying	0%	0%	1%
C : Manufacturing	2%	11%	7%
D : Electricity, gas, steam and air conditioning supply	1%	0%	1%
E : Water supply; sewerage and waste management	0%	0%	1%
F : Construction	3%	7%	6%
G : Wholesale and retail trade; repair of motor vehicles	11%	20%	14%
H : Transportation and storage	3%	6%	4%
I : Accommodation and food service activities	10%	5%	8%
J : Information and communication	5%	7%	3%
K : Financial and insurance activities	10%	1%	3%
L : Real estate activities	1%	1%	1%
M : Professional, scientific and technical activities	9%	5%	7%
N : Administrative and support service activities	8%	9%	8%
O : Public administration and defence; compulsory social security	7%	7%	6%
P : Education	10%	6%	8%
Q : Human health and social work activities	15%	12%	16%
R : Arts, entertainment and recreation	3%	3%	3%
S : Other service activities	2%	1%	2%

Table 7.5: Relative Sectoral Share of Employment, 2017[9]

Business Base

In 2018, there were 18,630 businesses operating out of Edinburgh. There was an increase of 19% in the five years from 2013. This is similar to West Lothian with growth of 18% over the five years. Edinburgh and West Lothian have both seen growth of 5% and 4% more than that nationally.

Sector	Edinburgh	% Change	West Lothian	% Change	Scotland	% Change
Agriculture, forestry and fishing	155	13%	145	10%	17,375	1%
Mining and quarrying	10	0%	0	0%	235	-34%
Manufacturing	510	18%	290	12%	9,225	15%
Electricity, gas	80	69%	5	0%	700	59%
Water supply; sewerage, waste management	20	25%	10	50%	435	8%
Construction	1,500	19%	580	17%	20,205	15%

[9] Source: Business Register and Employment Survey. *= disclosive data. In keeping with NOMIS guidelines, all date has been rounded to the nearest 100 before being published.

Wholesale and retail trade;	1,935	-3%	710	8%	23,270	0%
Transportation and storage	275	29%	230	20%	5,495	20%
Accommodation and food service activities	1,655	21%	270	6%	13,855	14%
Information and communication	2,455	27%	475	29%	10,270	23%
Financial and insurance activities	855	16%	85	53%	3,125	22%
Real estate activities	825	12%	120	13%	5,515	15%
Professional, scientific and technical activities	4,315	19%	770	21%	31,435	15%
Administrative and support service activities	1,435	37%	350	29%	12,640	33%
Public administration and defence;	10	-50%	0	0%	50	-20%
Education	290	21%	50	30%	1,960	15%
Human health and social work activities	895	15%	155	3%	6,545	10%
Arts, entertainment and recreation	540	8%	110	14%	4,040	7%
Other service activities	870	17%	220	27%	8,355	18%
Total	18,630	19%	4,585	18%	174,730	14%

Table 7.6: Employment, 2018 and change since 2013[10]

Unemployment

The Claimant Count is a monthly measure of the number of people claiming benefits for unemployment reasons, measured by the Department for Work and Pensions (DWP).

Over the past four years, the claimant count in Edinburgh has consistently been lower than that of both West Lothian and Scotland; keeping close to 2%, currently sitting at 1.8% (Figure 7.5).

[10] Source: NOMIS UK Business Count 2013/2018. N.B. Some figures may not sum to total due to rounding errors.

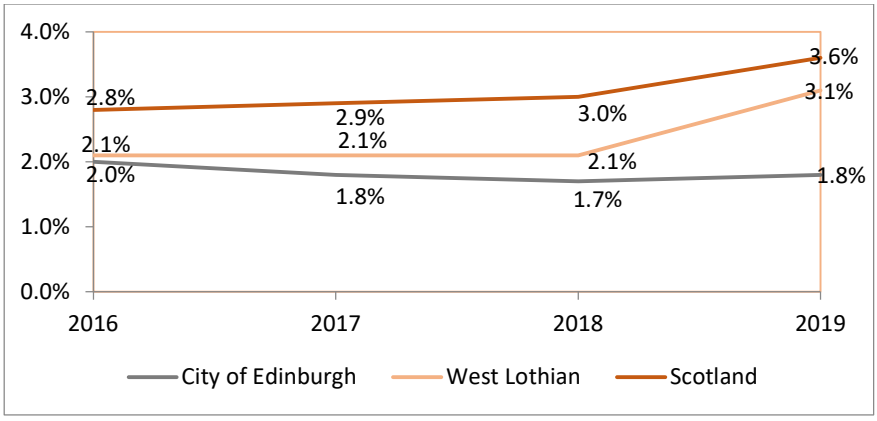

Figure 7.5: Claimant count 2016 - 2019[11]

Model based unemployment is a relatively more truthful measure than claimant count of workforce. This includes people who are unemployed, but not claiming out of work benefits.

Since 2016, unemployment in Edinburgh has been consistently lower than West Lothian and the national level. As shown in Figure 6 there was a sharp increase across the board in 2008-2010, following the financial crash. The number of claimants began to plateau over the subsequent 3 years, before dropping gradually from 2013 – 2018.

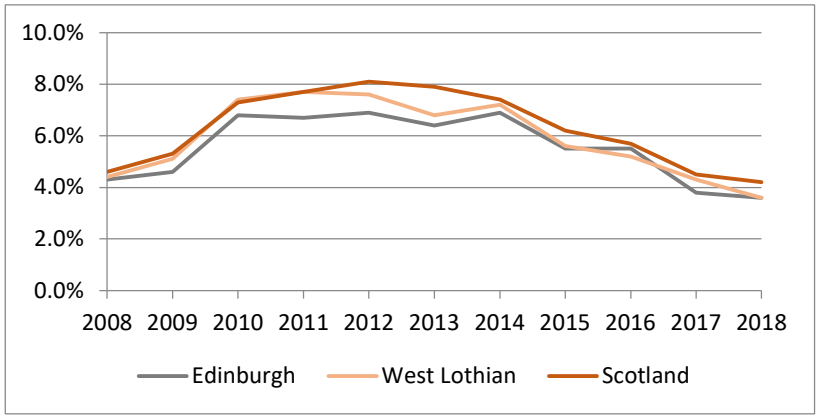

Figure 7.6: Unemployment Model Based Estimates, Q1 2008 – Q1 2018[12]

Skills

Working age residents in Edinburgh are typically qualified to a higher level than those at the West Lothian and Scottish level – 41% have level 4 or above qualification compared to 26% and 22% at the national and regional levels, respectively (Figure 7.7).

[11] Source: NOMIS Claimant Count

[12] Source: Scottish Government Statistics

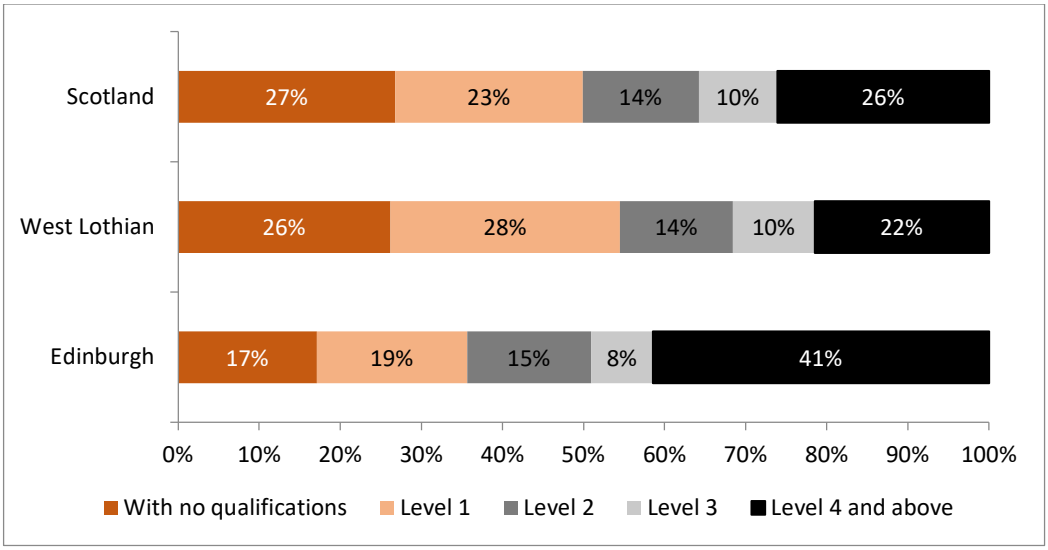

Figure 7.7 Highest Level of Qualification (aged 16+), 2011[13]

Edinburgh has a higher educated population compared to West Lothian and Scotland. Local Business and Industry may find requirement locally for staff. In neighboring west Lothian, however, there is a relative shortage (-18%) of level 2 and above educated workforce. It is a similar case to that of Scotland as a whole with a relative shortage of -14% of level 2 and above educated workforce.

7.2.3 Review of Local Socio-Economic Services

This brief review is of local services outlines the education and health care facilities currently serving the local population, alongside general community services.

It is estimated that proposed development will accommodate a population of approximately 2,500 people. It is assumed through our assessment that the residents of the proposed development will generate additional activity within the Edinburgh City Area as well as West Lothian also.

Education

The impact of the proposal on schools in the area is presented in the Education Impact Statement which accompanies the application.

The site sits within the catchment areas for the following schools:

- Dean Park Primary School;
- St Cuthbert's Primary School;
- Balerno High School; and
- St Augustine's High School.

Health Services

General Practitioners in the greater area include:

- Ratho Medical Practice (1.1km away);
- The Pentlands Medical Centre (3.5 km away); and
- East Calder Medical Practice (5.4 km away).

There may be future requirement for additional GPs at the surgery assuming that new residents are new to the area. However, we would expect that a proportion of residents already live in Edinburgh, or elsewhere in the Lothians. Therefore would be registered to a GP surgery which they may continue with.

[13] Source: 2011 Census Data

Dentists in the greater area include:

- Riccarton Dental Surgery (2.7 km away); and
- Artis Dental & Implant Studio (3.2 km away).

The nearest hospitals are St Johns in Livingston at 9.2 km, which has an accident and emergency department, and The Western General in Edinburgh at 9.8 km.

Transport

The proposed development at Hatton Mains sits adjacent to A71 connecting the greater Livingston area to Edinburgh City bypass and the Lothians. The City Bypass links to the M8 motorway. There are several B class roads running north connecting to Ratho, Newbridge and linking into the M9 motorway and M8 motorway interchange.

The Lothian bus route 20 links Ratho to the North to Edinburgh frequently. Two services, the 40 and 109 run by Horsburgh Coaches run several services daily also. To the east is of the development (3.1km) is the Hermiston Park and Ride facility which offers 9 services, including two night busses.

National cycle route 754 runs along the union canal, approximately 1 km to the East of the development. This cycle route connects Edinburgh to Glasgow almost entirely traffic free.

International links can be made with Edinburgh airport which sits approximately 2.6 km to the north.

In summary the proposed site has good transport links within the vicinity which could be built upon further.

7.2.3 Likely Significant Effects

Construction

Significant effects from construction are likely to be **minor positive** with the creation of employment and input to the local economy.

Operational

Significant effects from operation are likely to be **neutral**.

7.2.4 Mitigation

Construction

No mitigation is proposed for construction effects.

Operation

No mitigation is proposed for operational effects.

7.2.5 Residual Effects

Residual effects are likely to be **minor positive** with increased growth in the local economy.

7.3 Human Health Assessment

7.3.1 Introduction

This section of the EAR presents the finding of a Rapid Health Impact Assessment (HIA) conducted by McAleese & Associates (UK) Ltd. The HIA is presented in Appendix B2 in Volume 3.

The main objective of HIA is to apply existing knowledge and evidence about health impacts, to specific social and community contexts in order to develop evidence-based recommendations that inform decision-making.

This is done in order to protect and improve community health and wellbeing.

The methods and process used to undertake this HIA screening report are taken from the "Scottish Health and Inequality Impact Assessment Network (SHIIAN) Report: Health Impact Assessment Guidance for Practitioners".[14]

7.3.2 Baseline Community Profile

The baseline community profile has been developed from a range of publicly accessible statistics and data. The full profile is presented in Appendix B2. In summary, the health profile of the community is the existing area is as follows:

Population Structure

The population of Edinburgh was 511,670 in 2016. The population has an estimated growth rate of approximately 6.4% to 2026. This compares to Scotland at 5,404,700 and estimated to grow by 3% per year to 2026.

Unemployment is at 1.8% (Scottish average is 3.6%) in 2019; persons with no qualifications is significantly lower than the Scottish average (17% in Edinburgh with 27% for Scotland) and those with the highest qualification (level 4 and above) is 41% compared to a Scottish average of 26%.

Edinburgh has a lower than national average of older people (65+) at 15% (national average 19%), a lower number of children than the national average with 15% (national average 17%) and a higher number of people of working age compared to the national average of 70% (national average 64%).

Mortality

Life expectancies in 2011, at 77.4 years for males and 81.9 years for females, were higher than the Scottish average of 76.6 years for males and higher than the Scottish female average of 80.8 years.[15]

Social Care

In 2014, 5.1% of adults claimed incapacity benefit, severe disability allowance or employment and support allowance; this was similar to the Scottish figure of 5.1%. The percentage of those aged 65 years and over with high care needs cared for at home, at 38%, was higher than in Scotland overall (35%).

Crime

In City of Edinburgh the crude population crime rate for 2014 was higher than Scotland at 44/1000 (Scotland: 40/1000) and the crude domestic abuse rate was higher than Scotland at 116/10,000 (Scotland: 112/10,000).

Women's and Children's Health

In 2011–2013, the crude rate for teenage pregnancy was 38/1000, so similar to Scotland's 41/1000. In 2012/13–2014/15, 2% of births were low weight, lower than Scotland at 2%.

Immunization and Screening

For breast screening, the uptake rate of 69% in 2010–2012 was lower than the national average of 73%. For bowel screening, the uptake rate of 55% was lower than the 56% uptake for Scotland. The immunisation uptake for MMR (measles, mumps, rubella) by age 2 years was 95% in 2012–2014, similar to Scotland's 95%. The immunisation uptake for 5 in 1 (diphtheria, pertussis, tetanus, polio, Hib [meningitis]) by age 2 years in 2012–2014 was 98%, lower than Scotland's 98%.

Ill Health and Injury

The rate for cancer registration in 2011–2013 was, at 674, higher than Scotland's overall rate of 634. The rate for emergency hospitalisations in 2011–2013, at 6360, was lower than the rate for Scotland (7500). The rate for patients hospitalised for chronic obstructive pulmonary disease

[14] https://www.scotphn.net/wp-content/uploads/2015/11/Health-Impact-Assessment-Guidance-for-Practitioners-SHIIAN-updated-2019.pdf
[15] https://www.scotpho.org.uk/media/1068/scotpho-hwb-profiles-aug2016-edinburgh.pdf

(COPD) in 2011–2013, at 551, was lower than the Scottish rate of 660. In 2011–2013, coronary heart disease rate was, at 354, lower than the Scottish level of 440.

Mental Health

The percentage of people prescribed medication for anxiety, depression or psychosis in 2014/15 was, at 14%, lower than Scotland overall (17%).

Social Care and Housing

In 2014, 4.1% of adults claimed incapacity benefit, severe disability allowance or employment and support allowance; this was lower than the Scottish figure of 5.1%.

7.3.3 Human Health Context of the Development

Health Impacts cross a number of disciplines and sections within this EAR. Specific details and assessments including:

- Socio economic effects (this chapter);
- Cultural Heritage (Chapter 8);
- Biodiversity and Ecology (Chapter 9);
- Soils and Ground Conditions (Chapter 10);
- Hydrology (Chapter 11);
- Air Quality (Chapter 12);
- Noise (Chapter 13);
- Traffic and Transport (Chapter 14); and
- Landscape and Visual (Chapter 15).

The following Technical Appendices should also be referred to:

- Appendix B1: Socio-economic Impact Assessment;
- Appendix B2: Rapid Health Impact Assessment;
- Appendix C: Cultural Heritage Assessment;
- Appendix D: Biodiversity and Ecology;
- Appendix E: Contaminated Lands and Ground Engineering;
- Appendix F: Drainage and Flooding Impact Assessment:
- Appendix G: Air Quality Assessment;
- Appendix H: Noise Impact Assessment;
- Appendix I: Transport Assessment; and
- Appendix J: Landscape and Visual Impact Assessment.

7.3.4 Health Characteristics of the Proposed Development

The assessment of impact on the health of the population both new to, and within the local area, is both quantitative and qualitative. Ad below which aims to capture the aspects of Hatton Village as they relate to human health and its impacts:

- The proposal has good links to the local and strategic highway network;
- Users will find it convenient and safe to walk, cycle and travel by public transport between the site and existing urban developments such as Edinburgh;
- Users will be able to conveniently access facilities within the existing site by foot and cycle thus making sustainable and healthy use of existing homes, workplaces, shops, education, health, recreation, leisure, and community facilities;
- The proposal preserves the character and setting of designated and non-designated heritage assets; the significance of which has been assessed within the Cultural Heritage Assessment submitted as part of this EAR (Appendix C);
- Designed to protect the amenity of the occupiers of residential properties nearby, and any future occupiers of the development through good design and landscaping. This includes the use of double glazing with appropriate acoustic measures, acoustic fencing, placing gardens away from sources of noise and through the construction of a 'green wall' to mitigate the noise impacts from the adjacent main road (Appendix H);
- Modern homes have a high-quality design which incorporates energy efficient considerations such as LED lighting, high efficiency boilers, water efficient taps, high performance insulation and air tightness testing to each property;

- The proposal has been developed without increasing the risk of flooding. A Flood Risk Assessment and drainage strategy is submitted as part of this EAR and provides an appropriate assessment of the development in relation to flood risk (Appendix F);
- The proposal does not harm biodiversity, but rather enhances it wherever possible, including increasing tree-cover and open, green spaces;
- The proposal will create well designed public open space that is accessible from all parts of the development;
- The development will contribute to the increased viability of local facilities, businesses and the existing local community;
- The development will contribute towards the creation of sustainable communities through the provision of a mix of housing types and tenures; and
- Facilitates the extension of or new provision for Primary School education which will provide more school places than would be generated by the proposed development;

7.3.5 Likely Significant Health Effects

Construction Phase

- Air quality: Potential adverse effects from the release of dust particles include:
  - loss of amenity due to deposition and soiling of surfaces;
  - damage to crops and other vegetation; and
  - human respiratory ill-health due to inhalation.

  Most airborne particles from construction and demolition are above the diameter at which adverse effects on human health are likely to occur.

  As with most developments, site clearance, groundworks and construction operation can be potentially dusty procedures. Dust means all particles < 75 µg in diameter.

  Local impacts from dust tend to be felt within only 50m of the boundary of the site (with some impacts on human receptors being felt at up to 350 metres, under exceptional circumstances). The predominant wind direction is westerly. Therefore, any dust is likely to be blown eastwards from the site across agricultural land.

  Dust could become more of an issue once the site starts to become occupied with residents experiencing dust impacts from the next phase of construction. However, this effect has been mitigated for by phasing the build out of the project from west to east.

- Noise: Noise during construction can cause disturbance, annoyance and loss of amenity.
- Soil and Water Pollution**:** This can occur as a result of the operation of plant and machinery, of concrete and cement spillage and from contamination incidents.

Operational Phase

Air Quality is likely to be impacted by pollution from increased car use in the area generated by additional residential traffic;

Noise is likely to result from increased traffic noise from residents.

7.3.6 Health Mitigation Measures

Construction Phase

Construction impacts are short term and temporary.

Specific mitigation measures around air quality, noise and pollution are presented in their respective EAR chapters and sections:

- Air quality mitigation measures: Section 12.6;
- Noise mitigation measures: Section 13.6;
- Geological mitigation measures: Section 10.6 and
- Hydrological mitigation measures: Section 11.6.

Operational Phase

Most impacts identified are significantly positive from a health perspective.

The site will provide the opportunity to experience a high standard of accommodation and of living. Consequently, no mitigation is proposed as any mitigation is embedded within the design of the development.

7.3.6 Residual Human Health Effects

All residual human health effects are considered to be **moderate positive**.

7.4 Cumulative Effects

There are no other developments which will interact with Hatton Village on a health or socio-economic basis. Therefore, cumulative effects are not considered further in this chapter.

Chapter 8

Cultural Heritage

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Chapter 8 Cultural Heritage

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8 Cultural Heritage

8.1 Introduction

8.1.1 Introduction

This chapter describes the potential effects of the proposed Hatton Village development on the cultural heritage and archaeological receptors in the local area. This chapter has been informed by the following technical studies:

- Desk Based Assessment (AOC Archaeology, December 2018); and
- Archaeological Geohphysical Survey (AOC Archaeology, April 2019);

These reports are presented in Appendix C.

This chapter has been produced in full recognition of consultee and public input during the consultation procedures, outlined in Chapter 5 (Environmental Assessment) and should be read with reference to Chapter 3 (The Proposed Development) and, particularly, Chapter 15 which focuses on landscape impacts.

8.1.2 Scope of the Assessment

Baseline desk-based assessments have been completed to inform this chapter of the EAR. The methods used conform to industry standard for this type of work. It is anticipated that a full intrusive Site Investigation will be undertaken as part of the work to accompany a detailed planning application for the site.

This application is based on a conceptual Masterplan and there is no detailed housing layout available for the site. Accordingly, this assessment aims to identify constraints from existing and proposed activities that could impact negatively on existing soils or the underlying geology, especially with regards to historical contaminants release and to ensure that these are taken into account when determining the proposed land uses.

8.2 Legislation and Policy

Cultural heritage in Scotland enjoys protection from a range of measures, some set at the international/intergovernmental level, some at national, and some at local. The cultural heritage policies that are of relevance to the development at Gavieside are listed below.

8.2.1 International Treaties and Conventions

The United Kingdom government is party to the `Valetta Convention', the European convention on the protection of archaeological heritage. Article 2 notes that States must have a legal system for the protection of the archaeological heritage, on land and underwater. Article 4 requires provision for the "*the conservation and maintenance of the archaeological heritage preferably in situ*."

8.2.2 National Planning Policy Guidelines

The statutory framework for heritage in Scotland is outlined in the Town and Country Planning (Scotland) Act 1997 [ref 8.2], as amended in the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 [Ref 8.3] and the Ancient Monuments and Archaeological Areas Act 1979 both of which are modified by the Historic Environment (Amendment) (Scotland) Act 2011.

The implications of these Acts with regard to local government planning policy are described within Scottish Planning Policy (SPP), Historic Environment Scotland Policy Statement (HESPS) and Planning Advice Notes (PAN) for Scotland. SPP, HESPS and PAN 2/2011 '*Archaeology and Planning*' deal specifically with planning policy in relation to heritage. The planning guidance expresses a general presumption in favour of preserving heritage remains in situ. Their '*preservation by record*' (i.e. through excavation and recording, followed by analysis and publication, by qualified archaeologists) is a less desirable alternative.

HESPS sets out the Scottish Government's policy for the sustainable management of the historic environment. Key principles of the policy note that '*there should be a presumption in favour of preservation of individual historic assets and also the pattern of the wider historic environment; no*

historic asset should be lost or radically changed without adequate consideration of its significance and of all the means available to manage and conserve it' (1.9b, page 9).

8.2.3 Scheduled Monuments

SPP (2014) states that a new development must not impact upon the area of a Scheduled Monument without the prior formal consent of Scottish Ministers as advised by Historic Environment Scotland. A development may not have a direct i.e. physical impact upon a Scheduled Monument without Scheduled Monument Consent. The setting of Scheduled Monuments is also a key consideration when determining applications.

8.2.4 Historic Gardens and Conservation Areas

SPP (2014) makes the following statements:

'*Planning authorities should protect and, where appropriate, seek to enhance gardens and designed landscapes included in the Inventory of Gardens and Designed Landscapes and designed landscapes of regional and local importance*' (Scottish Government 2014, Paragraph 148).

8.2.5 Strategic Development Plan

The following SESPlan policy is relevant to cultural heritage and the current Proposed Development:

- Policy 1B The Spatial Strategy: Development Principles

  Local Development Plans will:

  "*…..Ensure that there are no significant adverse impacts on the integrity of international and national built or cultural heritage sites in particular World Heritage Sites, Scheduled Ancient Monuments, Listed Buildings, Royal Parks and Sites listed in the Inventory of Gardens and Designed Landscapes…*"

8.2.6 Edinburgh Local Development Plan

Within the Edinburgh LDP, there are a number of policies relevant to the development. These are:

- Policy Env 3: Listed buildings – Setting;
- Policy Env 6: Conservation Areas – Development;
- Policy Env 7: Historic Gardens and Designated Landscapes; and
- Policy Env 8: Protection of Important Remains.

8.3 Methodology

8.3.1 Objectives

The main objective of this chapter is to identify the archaeological and cultural heritage value of the Site at Hatton Mains and to identify the potential for direct and indirect effects which may result as a consequence of the proposed development.

The evidence presented and the conclusions offered will provide a comprehensive basis for further discussion and decisions regarding heritage constraints on the future development of the Site and for the formulation of a further mitigation strategy, should this be required. This will be done by examining a variety of evidence for upstanding and buried remains of heritage interest including Scheduled Monuments, Listed Buildings, Conservation Areas, Inventory Gardens and Designed Landscapes and Inventory Battlefields and non-designated heritage assets within 500m of the Site. The impact upon the settings of designated assets within 1km of the Site will also be examined.

8.3.2 Standards

The scope of this assessment meets the requirements of current planning regulations set out in SPP, HESPS and PAN2/2011, and local planning policy.

Archaeology Group conforms to the standards of professional conduct outlined in the Chartered Institute for Archaeologists' (CIfA) Code of Conduct, the CIfA Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology, the CIfA Standards and Guidance for Historic Environment Desk Based Assessments, Field Evaluations and other relevant guidance.

8.3.3 Data Sources

The following data sources were consulted during preparation of this desk-based assessment:

- Historic Environment Scotland:
  For National Record of the Historic Environment data;
- Historic Environment Scotland:
  For National Collection of Aerial Photography, National Record of the Historic Environment Search Room and designated asset data sets; and
- National Map Library (National Library of Scotland, Causewayside, Edinburgh):
  For old Ordnance Survey maps (1st & 2nd Edition, small and large scale) and pre-Ordnance Survey historical maps.

8.3.4 Limitations

This assessment is based upon data obtained from publicly accessible archives as described in the Data Sources in Section 8.3.3. All heritage assets within 500m of the Site were identified and designated heritage assets within 1km of the Site were also identified to assess the potential for impacts upon their settings. Data from the National Record of the Historic Environment was obtained in November 2018. The information presented in the gazetteer regarding known heritage assets is current to this date.

It should be noted that the report has been prepared under the express instructions and solely for the use of Inverdunning (Hatton Mains) Ltd and their partners. All the work carried out in this report is based upon AOC Archaeology Group's professional knowledge and understanding of current (December 2018) and relevant United Kingdom standards and codes, technology and legislation.

Changes in these areas may occur in the future and cause changes to the conclusions, advice or recommendations given. AOC Archaeology Group does not accept responsibility for advising Inverdunning (Hatton Mains) Ltd or associated parties of the facts or implications of any such changes in the future.

8.4 Baseline – Desk Based Investigation

8.4.1 Introduction

The desk-based assessment conducted by AOC Archaeology Ltd. This is presented in Appendix C1.

8.4.2 Scope

All known heritage assets located within a 1km radius of the edge of the Site have been identified by this assessment (Figure 8.1). The aim of this is to help predict whether any similar hitherto unknown archaeological remains are likely to be impacted by the Proposed Development. Designated assets within 500m of the site boundary have been identified (Figure 8.2) with an aim of assessing the potential for impacts upon their settings.

All recored and mapped assets are presented in the Site Gazetteer in Appendix C1.

8.4.1 Prehistoric and Roman (8000 BC AD 410)

There are three recorded assets within the Site dating to the prehistoric period. These features are recorded within the northern half of the Site. Sites 87 and 88 mark the location of potential prehistoric enclosures identified on aerial photographs from 1975 and 1991. Site 87 comprises one sub-circular enclosure containing a circler feature and it appears to be associated with a line of small circular postholes or pits. Another horseshoe shaped feature was visible to the south of this feature. Site 88 marks the location of a curvilinear feature visible on aerial photography, it is open to the east and there is a possible internal feature contained within the larger curvilinear feature. These two sites potentially mark the location of prehistoric settlements.

Site 89, situated 45m east of the probable prehistoric enclosure at Site 88 marks the location of a very dispersed scatter of prehistoric flint and chert artefacts including a rare Late Neolithic chisel arrowhead.

A further two sites from the prehistoric period are located in fields adjacent to the Site; these are located at Site 91, situated 15m to the west of the Site and Site 92, situated 300m to the east of the Site.

Site 91, marks the location of two fragile sherds of probable Bronze Age pottery associated with a group of flint and chert artefacts which included a chert scraper. The fragile nature of the artefacts uncovered indicated that they were probably freshly ploughed up from underlying deposits.

Site 92 marks the central location of a scatter of prehistoric flint and chert artefacts, a notable concentration of these artefacts was recorded in the centre of the field.

The nature and location of these prehistoric remains in the north of the Site and in immediately adjacent fields indicates that there is a High potential for artefacts or remains, particularly of a settlement and flint/chert working nature to be present within the Site and particularly within the northern half.

There is one find dating to the Roman period within the Site, situated at Site 90. This consisted of a sherd from a Roman amphora. It is likely that Site 90 does not mark a Roman occupation site but was rather the result of a chance loss or a find from a potential Iron Age site. There are no heritage assets or finds dating to the Roman period within the 1km Study Area. Therefore, there is considered to be a Low potential for Roman remains to survive on the Site.

8.4.2 Early Historic and Medieval (AD 410 - 1600)

No remains or artefacts from the Early Historic or medieval period have previously been identified on the Site or within the 500m Study Area, although this may simply represent a lack of opportunities for investigation. Based on current evidence however, there is considered to be a Low potential for remains or artefacts from the Early Historic and medieval periods to be present on the Site.

8.4.3 Post-medieval (AD 1600 - 1900)

No remains dating to the post-medieval period are present within the Site, the estates of Hatton, Dalmahoy and Addistoun are outwith the Site boundary and there is no evidence that the estates associated directly with the houses encroached on the Site.

A tower house was present on the Hatton estate (centred at Site 86, Hatton House, Inventory Garden and Designed Landscape No. GDL00209, 1.1km to the west of the Site) in the 15th century and this was subsequently developed into the Hatton House mansion between 1664 and 1692.

Early pre-Ordnance Survey maps of the Site tend to be schematic and lack detail. Blaeu's Map of 1654 shows the probable location of Dalmahoy Mains (labelled *'Dalmahoy'*), Kirknewton (labelled '*Kirknewtown')* and Humbie (labelled *'*Humby') to the west of the Site. Due to the layout of roads and settlement names on Blaeu's Map of 1654 it is difficult to ascertain the probable location of the Site and there are few details concerning the nature of the area in the possible location of the Site. A structure with trees and a boundary fence on the structure's southern side, labelled *'Dal mahay',* appears to be the closest feature to the Site and is the probable location of Dalmahoy. The road that Dalmahoy is situated on probably marks the old northeast to southwest road which would have been in use before the construction of the modern A71 to the north of Dalmahoy; this road roughly follows the road pattern currently in use and is probably the precursor to the Long Dalmahoy Road to the south of Dalmahoy.

Roy's Map of 1752 to 1755 is the first map to show the Site in detail. The Site is depicted as consisting of arable fields with a south to north road bisecting it that matches the modern Dalmahoy Road. To the south, Dalmahoy House (Site 6, Listed Building Category A), constructed in 1725 is depicted; the precursor to the current Addistoun House (Site 73, Category B) labelled '*addiston'* is depicted to the east. To the west there is a feature labelled *'Entryhead'*. However, this does not match the current location of any features associated with the term 'Entry Head' such as Site 17 and the Category A Listed Bridge on the Dalmahoy Estate at Site 63; *'Entryhead'* probably marks the location of an older entrance way on the west side of the Dalmahoy Estate. Further to the west the location of the now demolished Hatton House (labelled *'Haltton'*) (Canmore ID 50361) and its associated Garden and Designed Landscape (centred Site 86, GDL00209) is clearly depicted. To the

north the settlement of Ratho (labelled *'Rathaw'*) is depicted. The Site is bound along its southern edge by a road that matches the configuration of the modern A71.

Laurie's Map of 1766 confirms the arable nature of the Site, Hatton Mains is depicted although it is not clear whether the structures depicted are related to any of the current structures at Hatton Mains. In other respects, Laurie's Map shows less detail than Roy's earlier map; the south to north Dalmahoy Road is not depicted.

AOC understand from the current landowner that the Site historically formed part of the Hatton House estate which was sold in 1792. The estate underwent incremental changes and fragmentation. In 1820 the tenant of Hatton House, Captain Davidson, attempted to restore the house and grounds. Unfortunately this incurred enormous debts and a factor was appointed by the Commissioners named by the Court of Sessions to administer the property. This resulted in the felling of many of the trees that lined the Great East Avenue, although the avenue itself survives as part of the Hatton House IGDL (Site 86).

The first Ordnance Survey Map to show the Site in detail was published in 1853. The Site is shown as consisting of 11 fields bisected by the south to north Dalmahoy Road. The buildings of Hatton Mains to the west of the Site, along the north side of the road, are clearly depicted although they have not yet developed into their modern configuration. Hatton Mains is depicted as being composed of two separate ranges and the Category C Listed Building of Easter Hatton and Gates (Site 65) has not been built by the time of this map.

By the time of the Ordnance Survey Map of 1894 the fields had been amalgamated into five larger fields. The Category C Listed Building of Easter Hatton and Gates (Site 65) is clearly depicted on the map.

Due to the lack of artefacts or remains dating to the post-medieval period within the Site, the nature of the estates of Hatton, Dalmahoy, Addistoun and the farm and buildings of Hatton Mains out with the Site there is a considered to be a Low potential for archaeological remains of this period to be present on the Site. Any remains of this date that do survive would likely be related to agricultural use of the land.

8.4.4 Modern (AD post 1900)

Ordnance Survey Mapping in the modern period shows no changes to the land use on the Site. Hatton House (centred at Site 86, Hatton House, Inventory Garden and Designed Landscape No. GDL00209, 1.1km to the west of the Site) was gutted by fire in 1952 and demolished in 1955. A bungalow was built on the site of Hatton House and the remnants of the terrace gardens and structures survive within the immediate vicinity of the modern bungalow.

8.5 Site Investigation

8.5. Initial Site Walkover Survey

An initial site visit was undertaken on the 27th November in overcast to sunny, dry weather. The Site is comprised of five arable fields (Appendix C1, Plates 1 to 11).

No archaeological remains, features or artefacts were identified within the Site during the walkover survey.

8.5.2 Geophysical Survey

Rationale

Due to the findings of the desk-based assessment, and in consultation with CEC, it was decided that a geophysical survey was required to further inform the findings of the desk-based assessment. The overall aim of the geophysical survey was to identify any potential archaeological anomalies that would enhance the current understanding of the archaeological resource within the proposed survey area. The survey report is presented in Appendix C2.

Specifically, the aims of the gradiometer survey were:

- To locate, record and characterise any surviving sub-surface archaeological remains within the survey area;

- To help determine the next stage of works as per the client's instruction;
- To provide an assessment of the potential significance of any identified archaeological remains in a local, regional and (if relevant) national context; and
- To produce a comprehensive site archive and report.

Methodology

All geophysical survey work was carried out in accordance with recommended good practice specified in the EAC guideline documents published by Historic England (Schmidt et al. 2016) and the Chartered Institute for Archaeologists Standard and Guidance for archaeological geophysical survey (2014).

Parameters were selected that were suitable for the prospective aims of the survey and in accordance with recommended professional good practice (Schmidt et al. 2016).

The gradiometer survey was carried out using Bartington Grad601-2 fluxgate gradiometers (see Appendix C2). Data was collected on an east-west alignment using zig-zag traverses, with a sample interval of 0.25m and a traverse interval of 1m. A total of 710 full or partial 30m by 30m grids were surveyed within the specified area, totalling an area of approximately 56ha.

Attention was taken to avoid metal obstacles present within the survey area during data collection using gradiometers. Gradiometer survey is affected by 'above-ground noise' such as metal objects, and avoiding these improves the overall data quality and results obtained.

Interpretations of the data were created as layers in AutoCAD LT 2009 / GIS and the technical terminology used to describe the identified features can be found in Appendix C2, Appendix 6.

Results

The gradiometer survey results have been visualised as greyscale plots, with an overall view of the processed data plotted at -1nT to 2nT in Figure 8.3, followed by an overall interpretation of the data is presented in Figure 8.4.

The results of the survey have been dominated by what would appear to be a combination of geological outcropping and night soiling / green waste. Following from the landowner's comments regarding night soiling during the 1900's, it is likely that this is what has caused the disruption to the visibility of the dataset and that the material in question is particularly magnetic in its makeup.

Interpretation

The gradiometer survey has not identified any anomalies or features of a definitive archaeological nature.

A spread of magnetic disturbance across all five fields, likely the result of historical night soiling alongside geological variations, has hampered the visibility of anomalies throughout the datasets. Whilst trends have been identified amongst the magnetic noise, their interpretations are tentative, as it is difficult to tell if they are archaeological anomalies or if they relate to agricultural or modern activities.

A number of linear, curvilinear, circular and rectilinear trends have been identified in all five datasets for the site. A number of the trends are indicative of archaeological activity, such as enclosures, ring ditches, field systems and trackways. If the trends are of an archaeological nature, they suggest a wide potential archaeological landscape.

Although HER records exist across the site, none can be definitively linked to these possible archaeological anomalies as the trends are not clear enough to be interpreted with confidence. Similarly, with the aerial photographic records for the site, the locations of the anomalies identified in the photographs cannot be definitively assigned to anomalies identified in the datasets due to the high level of magnetic disturbance across the site disrupting their visibility. However, the HER records do suggest a potential for Prehistoric and Roman remains in the north of the site from finds identified during fieldwalking, lending support to the anomalies being of an archaeological nature.

This is likely the case across most of the fields, whereas other weaker trends are likely to be a combination of agricultural ploughing or drainage trends and geological variations.

8.6 Assessment of Effects

8.6.1 Sensitivity

The criteria for establishing a heritage asset's relative sensitivity is outlined in Table 8.1.

Relative Sensitivity	Criteria
High	An asset whose setting contributes substantially to an observer's understanding, appreciation and experience of it should be thought of as having High Sensitivity to changes to its setting. This is particularly relevant for assets whose setting, or elements thereof, contribute directly to their significance (e.g. form part of their Key or Contextual Characteristics (HESPS 2016)). For example, an asset which retains an overtly intended relationship with its setting and the surrounding landscape. These may in particular be, but are not limited to, assets such as ritual monuments which have constructed sightlines to and/or from them or structures intended to be visually dominant within a wide landscape area e.g. castles, tower houses, prominent forts etc. Setting is the way in which the surroundings of a historic asset or place contribute to how it is experienced, understood and appreciated. Therefore, an asset, which relies heavily on its modern surroundings for its understanding, appreciation and experience, is of high sensitivity. In particular an asset whose setting is an important factor in its protection and in retention of its cultural value (as per SPP (2014) definition of setting).
Moderate	An asset whose setting contributes moderately to an observer's understanding, appreciation and experience of it should be thought of as having Moderate Sensitivity to changes to its setting. This could be an asset for which setting makes a contribution to value but whereby its value is derived mainly from its other qualities (HESPS 2016 Annex 1). This could for example include assets which had an overtly intended relationship with their setting and the surrounding landscape but where that relationship (and therefore the ability of the asset's surroundings to contribute to an understanding, appreciation and experience of them) has been moderately compromised either by previous modern intrusion in their setting or the landscape or where the asset itself is in such a state of disrepair that the relationship cannot be fully understood. An asset, the current understanding, appreciation and experience of which, relies partially on its modern aesthetic setting regardless of whether or not this was intended by the original constructors or users of the asset. An asset whose setting is a contributing factor to its protection and the retention of its cultural value.
Low	An asset whose setting makes some contribution to an observer's understanding, appreciation and experience of it should generally be thought of as having Low Sensitivity to changes to its setting. This may be an asset whose value is mainly derived from its other characteristics and whereby changes to its setting will not materially diminish our understanding, appreciation and experience of it. This could for example include assets which had an overtly intended relationship with their setting and the surrounding landscape but where that relationship (and therefore the ability of the assets' surroundings to contribute to an understanding, appreciation and experience of them) has been significantly compromised either by previous modern intrusion to its setting or the landscape or where the asset itself is in such a state of disrepair that the relationship cannot be determined.

Table 8.1: Sensitivity criteria

8.6.2 Magnitude

The magnitude of indirect impact upon the setting of heritage assets by the proposed development is an assessment of the magnitude of change to the setting of any given heritage asset (Table 8.2), in particular those elements of the setting that inform its cultural value.

Magnitude	
Major	Direct and substantial visual impact on a key sightline to or from a ritual monument or prominent fort; direct and substantial visual impact on a key 'designed-in' view or vista from a Designed Landscape or Listed Building. Direct severance of the relationship between an asset and its setting. An impact that changes the setting of an asset such that it threatens the protection of the asset and the understanding of its cultural value SPP 2014).
Moderate	Oblique visual impact on an axis adjacent to a key sightline to or from a ritual monument but where the key sightline of the monument is not obscured. Oblique visual impact on a key 'designed-in' view or vista from a Designed Landscape or Listed Building. Partial severance of the relationship between an asset and its setting. Notable alteration to the setting of an asset beyond those elements of the setting which directly contribute to the understanding of the cultural value of the asset. An impact that changes the setting of an asset such that the understanding of the asset and its cultural value is marginally diminished.
Minor	Peripheral visual impact on a key sightline to or from a ritual monument, designed landscape or building. Slight alteration to the setting of an asset beyond those elements of the setting which directly contribute to the understanding of the cultural value of the asset. An impact that changes the setting of an asset, but where those changes do not materially affect an observer's ability to understand, appreciate and experience the asset.
Negligible	All other setting impacts

Table 8.2: Magnitude criteria

8.6.3 Significance

The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the impacts can be beneficial or adverse. The Effect Significance Matrix is set out in Table 8.3.

Sensitivity			
	High	**Moderate**	**Low**
Major	Major Adverse/Beneficial	Major – Moderate Adverse/Beneficial	Moderate – Minor Adverse/Beneficial
Moderate	Major – Moderate Adverse/Beneficial	Moderate – Minor Adverse/Beneficial	Minor Adverse/Beneficial
Minor	Moderate – Minor Adverse/Beneficial	Minor Adverse/Beneficial	Minor – Negligible
Negligible	Negligible	Negligible	Negligible

Table 8.3: Significance criteria

8.6.4 Direct Effects

Potential impacts on known or unknown buried archaeological remains which may survive within the Site relate to the possibility of disturbing, removing or destroying *in situ* remains and artefacts during groundbreaking works (including excavation, construction and other works) associated with the proposed development.

The desk-based assessment established that there may be evidence for prehistoric activity, potentially of a settlement nature within the Site. The geophysical survey found a spread of magnetic disturbance across all five fields, likely the result of historical night soiling alongside geological variations, has hampered the visibility of anomalies throughout the datasets. Whilst trends have been identified amongst the magnetic noise, their interpretations are tentative, as it is difficult to tell if they are archaeological anomalies or if they relate to agricultural or modern activities.

Therefore, there is a high potential impact on buried remains in the northern fields of the site. Depending upon the value of any remains encountered, the proposed development could potentially result in **significant** effects.

8.6.5 Indirect Effects

In the context of the proposed development the potential for indirect impacts are considered to be limited to statutory designated heritage assets within 1km of the Site, Scheduled Monuments will be considered first, followed by the Inventory Garden and Designed Landscape at Hatton House and then Listed Buildings. The Conservation Area of Ratho and designated assets therein will then be considered.

The Scheduled Monument on Tormain Hill

This consists of prehistoric cup and ring marked stones (Site 19) (Appendix C1, Plates 12 to 15), is situated 890m west of the Site. These stones were carved in situ on Tormain Hill. Although Tormain Hill is currently covered by trees, there are views across the Site towards Arthur's Seat, the volcanic rock on which Edinburgh Castle sits and towards the Pentland Hills. It is possible that these were key views during the prehistoric period. However, prehistoric cup and ring marked stones are enigmatic artefacts, their function, the nature of their setting and their visual relationships within a prehistoric landscape is open to differing interpretations. The Site is contained within a very shallow bowl below the cup and ring marked stones at Tormain Hill (Site 19) and between the asset and these notable topographic features. Although on low lying ground below Tormain Hill and not directly impeding on these views to Arthur's Seat, the volcanic rock on which Edinburgh castle sits and the Pentland Hills, the proposed development on the Site will appear within the viewshed and will add an urban element to a previously rural view. This impact will change the setting of this asset. However it will not materially affect an observer's ability to understand, appreciate and experience the asset. Therefore, the proposed development is considered to have a **Minor** impact on the setting of the cup and ring mark stones at Tormain Hill (Site 19).

The Scheduled Monument (Early Medieval) Cross Slab

This site (Site 7), (Appendix C1, Plate 16), is located at St Mary's Church, Dalmahoy and is circa 70m south of the Site. Originally recorded in 1880 as standing at the junction of three fields northeast of Hatton House (centred at Site 86, Hatton House, Inventory Garden and Designed Landscape No. GDL00209, 1.1km to the west of the Site), the stone shows evidence of being re-used as a gatepost. Before 1915 the (Early Medievel) Cross Slab was moved to its present location at Site 7. Notwithstanding the fact that its original setting is unknown and consequently lost, Site 7 has no intervisibility with the Site. Therefore, it is considered that the proposed development will have **No** impact on the setting of the Cross Slab (Site 7).

Hatton House, Inventory Garden and Designed Landscape

This site (GDL00209) (Site 86), extends to within 190m of the Site from the west. The easternmost boundary of Site 86 consists of the entranceway on the A71 and is situated 185m to the west of the Site. The Category A Listed Building of Hatton, East Avenue, Gate Piers (Site 16) (Appendix C1, Plate 17) and is situated 300m to the west of the Site at the end of the East Avenue of Hatton House Inventory Garden and Designed Landscape. This is a long avenue aligned west to east which rises up a gentle slope from the site of the former Hatton House (Plates 18 to 19). Roughly halfway along the avenue the focal point of the avenue on Arthur's Seat is revealed, this focal viewpoint diminishes as the East Avenue heads down a slight slope towards the East Avenue, Gate Piers (Site 16). The trees that formerly lined the East Avenue were cut down in the 19th century and the impact of the East Avenue is much dimished. This is compounded by the use of the area of the East Avenue for modern pastural farming. However, its remaining alignment and the impressive Gate Piers at Site 16 still allow for an appreciation of its former grandeur. The East Avenue and the Gate Piers (Site 16) face east towards the Site and Hatton Mains (Appendix C1, Plate 20). The presence of a modern

bungalow just to the south of the Gate Piers (Site 16) and within Hatton House Inventory Garden and Designed Landscape (centred Site 86), already imposes a Low impact upon the settings of Sites 86 and 16, as do the existing buildings of Hatton Mains Farm. Therefore, due to the dimished settings of Site 86 and 16 caused by these effects, it is considered that the proposed development on the Site will have a **Negligible** impact on the setting of Site 86 and 16.

St Mary's Episcopal Rectory

The Category A Listed Building consisting of a Church Hall And Rectory Cottage (Site 67) (Appendix C1, Plate 21) is situated between the main western and eastern portions of the Site. Site 67 was built at the same time as St Mary's Episcopal Church (Site 56) as functional buildings for the choir school and domestic quarters for the choirboys and choirmaster. The current buildings maintain the plan laid out in 1850 and consist of 3 buildings comprising of a hall, cottage and rectory arranged in an L-shaped pattern, facing south towards the modern A71. The boundary of the Site bounds the Site 67 on its northern and eastern sides. The main elevation faces south and west into an enclosing yard and entranceway. This elevation is screened to the west by tall, deciduous trees. Views to and from Site 67 are partially screened on the northern and eastern sides by tall deciduous trees. The main elevation faces away from the Site and the proposed development will not impact upon views to or from this main elevation. As it is considered that the proposed development on the Site will have a **Negligible** impact on the setting of Site 67.

Gate Piers

The Category B Listed Building (Site 55) (Appendix C1, Plates 22 to 23) of the Dalmahoy Estate are situated 10m southeast of the western portion of the Site across the modern A71. The Gate piers face north towards a crooked T junction and the south to north undesignated Dalmahoy Road. The Gate Piers have intervisibility with the a limited portion of the southwest area of the Site; the proposed development on the Site will change this view from a rural to an urban setting. However, the principal setting pf Site 55 is as an impressive entrance for the Dalmahoy Estate and they are meant to be viewed from the north, as such views from them towards the Site are of less importance as they don't contribute to an understanding and appreciation of the Gate piers and their relationship with the estate. Therefore, it is considered that the proposed development on the Site will have a **Negligible** impact on the setting of Site 55.

Gate Lodge of the Dalmahoy Estate

The Category C Listed Building (Site 11) (Appendix C1, Plate 24) is situated 25m southeast of the western portion of the Site across the modern A71. Views from the Gate Lodge to the north are partially screened by the estate wall and its situated facing west on to the main driveway into the Dalmahoy Estate just inside the entranceway formed by Gate piers at Site 55. Therefore, it's principal setting was a western aspect onto the driveway within the Dalmahoy Estate for people arriving on the Dalmahoy. Consequently, it is considered that the proposed development on the Site will have a **Negligible** impact on the setting of Site 11.

St Mary's Episcopal Church

The Category B Listed Building (Site 56) (Appendix C1, Plate 25), is situated 85m to the south of the Site. Existing buildings and treelines to the north of St Mary's Episcopal Church screen views in this direction, as such there is no intervisibility with the Site. Therefore, it is considered that the proposed development on the Site will have **No** impact on the setting of Site 56.

Dalmahoy Bridge

The late 18th century bridge (Site 63) is a, Category A Listed Building located 125m to the south of the Site and bridges the Gogar Burn. Site 63's principal setting would have been south towards Dalmahoy House (Site 6). The view north towards the Site is impeded by topography. There is no intervisibility with the Site and therefore, it is considered that the proposed development will have **No** impact on the setting of Site 63.

Farmhouse and Stable Buildings

The Category A Listed Buildings of the Farmhouse and Stable (Site 78) and the Farmhouse (Site 10) are respectively situated 320m and 345m south of the Site. They are situated just above the 90m AOD contour line as the topography starts to rise from the valley of the Gogar Burn to the ridgeline of Dalmahoy Hotel and Country Club. The buildings are function and set around a

courtyard enclosed within tall deciduous trees and as such they have limited or no intervibility with the Site. Therefore, due to the screening effect of the trees, the setting of Sites 78 and 10 within their own curtilage and the intervening distance between them and the Site it is considered that the proposed development on the Site will have **No** impact on the settings of Sites 78 and 10.

Dalmahoy House

The Category A Listed Building of Dalmahoy House (Site 6) is situated 425m to the south of the Site across the modern A71. The house is situated near the summit ridgeline at 100m AOD with a modern golf course to the south extending further up the slope to the maximum 120m AOD contour line; the modern golf course is not situated in between Site 6 and the Site. Dalmahoy House has two prominent entrances, on the west and east façades, the west entrance (Plate 26) has a porch for use by carriages while the east entrance (Plate 27) features stairs down to the garden. These are Dalmahoy House's principal setting with the gardens and landscape of Dalmahoy estate situated west and east across the ridgeline on which Dalmahoy House sits. Neither of these facades faces the Site. Dalmahoy House's view towards the Site is impaired by a modern hotel wing built to the north of the house (Appendix C1, Plates 28 to 29). Therefore it is considered, that the proposed development would have, at most, a **Negligible** impact on the setting of Site 6.

Ransfield Farmhouse

The Category C Listed Building of Ransfield Farmhouse and Gate Piers (Site 93) (Appendix C1, Plate 30) is situated 320m to the northeast of the eastern portion of the Site. Ransfield Farm's pincipal setting and role is associated with the working farm buildings to its north and the farm estate. The main elevation faces south towards the eastern portion of the Site, across a fountain and garden area to formal entrance gate piers. Although Ransfield Farm's principle visual setting is the entrance view from the south it is also apparent that Site 93 has a view to the field across the road to its southeast and towards the easternmost portion of the Site. This field seems to be associated with Site 93 and has an ornamental railing fence. Tall, deciduous trees are situated on the southeastern boundary of this field between Site 93 and the easternmost portion of the Site; these trees possibly form the main limit to the southern setting from Ransfield Farmhouse. Due to Site 93's principal use as a farmhouse associated with its estate, the partially screened and slightly oblique view to the Site and the intervening distance the impact of the proposed development on the Site could have a **Negligible** impact on the setting of Site 93.

Ratho Mains Farmhouse

The Category B Listed Building of Ratho Mains Farmhouse and Steading (Site 26) (Appendix C1, Plate 31) is situated 350m northwest of the northwest corner of the Site. Ransfield Mains Farmhouse's pincipal setting and role is associated with the working farm buildings to its west and northwest and the farm estate. Site 26 is situated in a dip below the Site to the north to the extent that only its upper, habitable storey and roofline are visible from the northern limit of the Site. Although the tall deciduous trees along the field boundaries between the Site and Site 26 do not totally impede the view they do still have a screening effect. Therefore, due to the screening effect of the topograhy, the intervening distance and tall deciduous trees between the asset there is considered to be a **Negligible** impact on the setting of Site 26.

Ratho

The Listed Buildings within the settlement of Ratho (Sites 29 to 33, 35 to 39, 42 to 43, 57 to 61, 70 to 72 and 75 to 77) and the Ratho Conservation Area (Site 85) are all contained within the bounds of modern Ratho. Their settings are within the settlement of Ratho which is situated partially within a shallow east to west valley within which the Scheduled Monument of the Union Canal (Site 84) is located; the Union Canal roughly follows the course of river that was located north of the main settlement area of Ratho prior to the construction of the canal. The Listed Buildings face inward to the main street of Ratho; this is orientated west to east before turning through ninety degrees and heading south to cross the Union Canal. Since these Listed Buildings were constructed Ratho has developed and been extended southwards beyond the southern elevations of these designated assets with modern housing development. These impede any views from the Listed Buildings to the Site and are assisted further by the screening tall trees and hedgerows of field boundaries between Ratho and the Site. This reduces any visibility of the Site from these designated assets to little or none. Therefore, given that the designated assets have a relationship and are contained within the dipping topography and curtilage of Ratho and the intervening distance to the

Site it is considered that the proposed development will have a **Negligible** impact upon the settings of this assets and Ratho Conservation Area (Site 85).

8.6 Mitigation

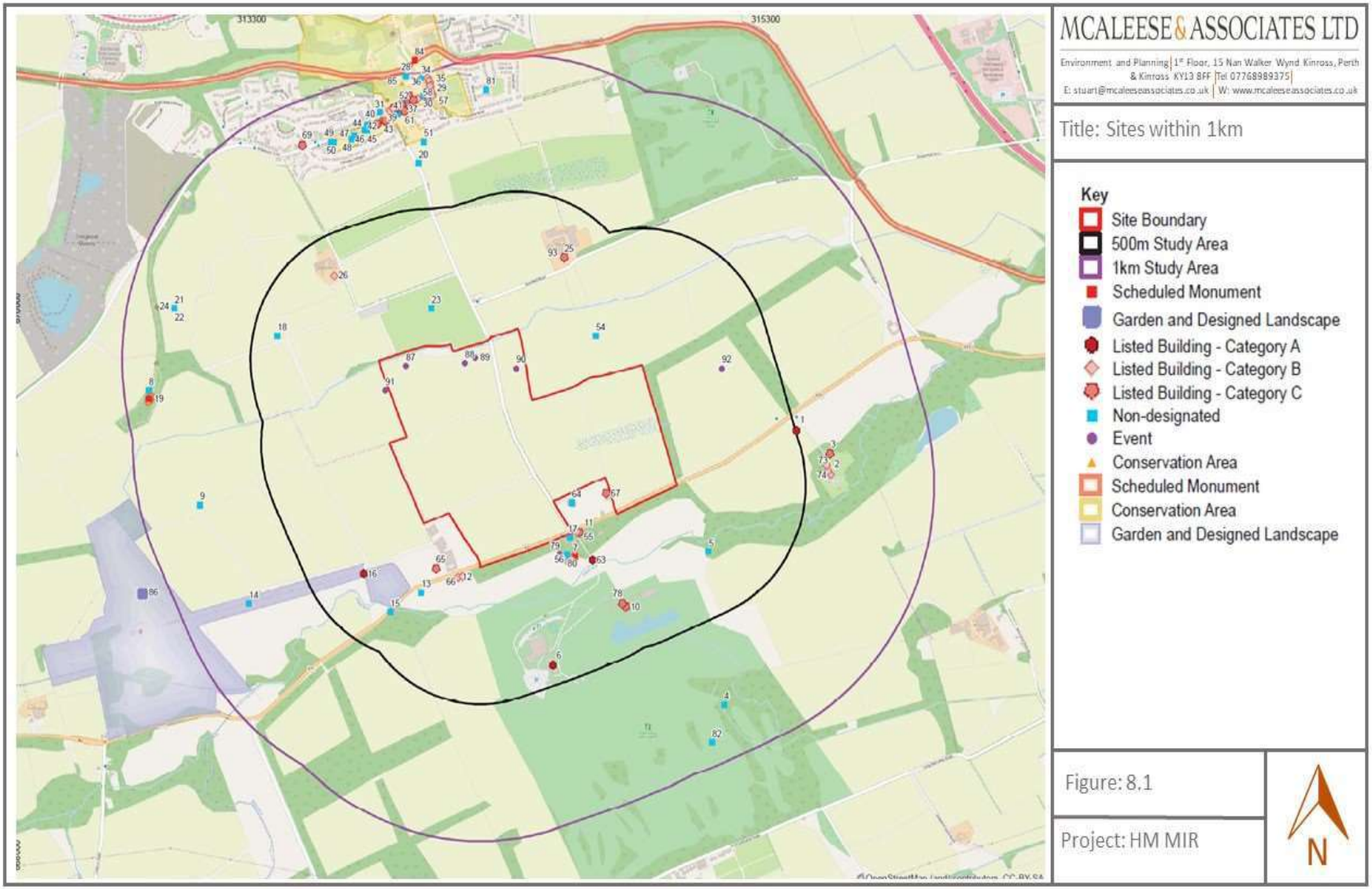
Whether or not the pattern of trends identified reflects an archaeological landscape will only be ascertained by more intrusive evaluation methods. As the spread of magnetically noisy material has hampered the visibility of the trends that have been identified, it is highly likely that a large amount of more discrete anomalies and remains are present within the field but are obscured from view and detection through geophysical survey.

Therefore, mitigation proposed is that of an intrusive site investigation to ascertain and record and findings in Field 1 and northern arm of Field 4. This will accompany the application for detailed planning consent for the site.

It is also proposed that an archaeological watching brief be carried out during construction.

8.7 Residual Effects

There is not anticipated to be any residual effects as a result of this development.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Environment and Planning | 1st Floor, 15 Nan Walker Wynd Kinross, Perth & Kinross KY13 8FF | Tel 07768989375 |
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1km Study Area
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Garden and Designed Landscape
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Listed Building - Category B
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Scheduled Monument
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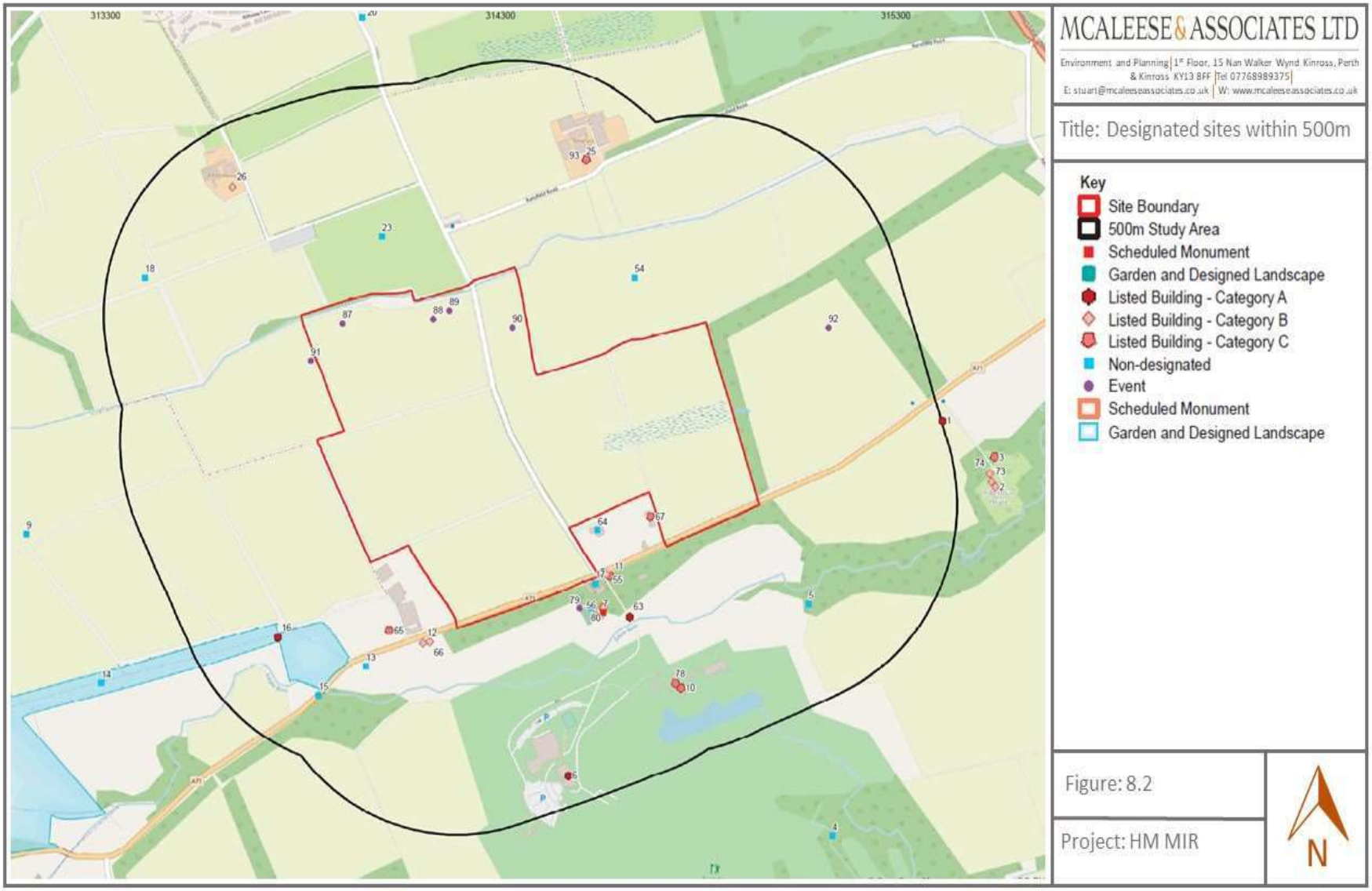
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500m Study Area
Scheduled Monument
Garden and Designed Landscape
Listed Building - Category A
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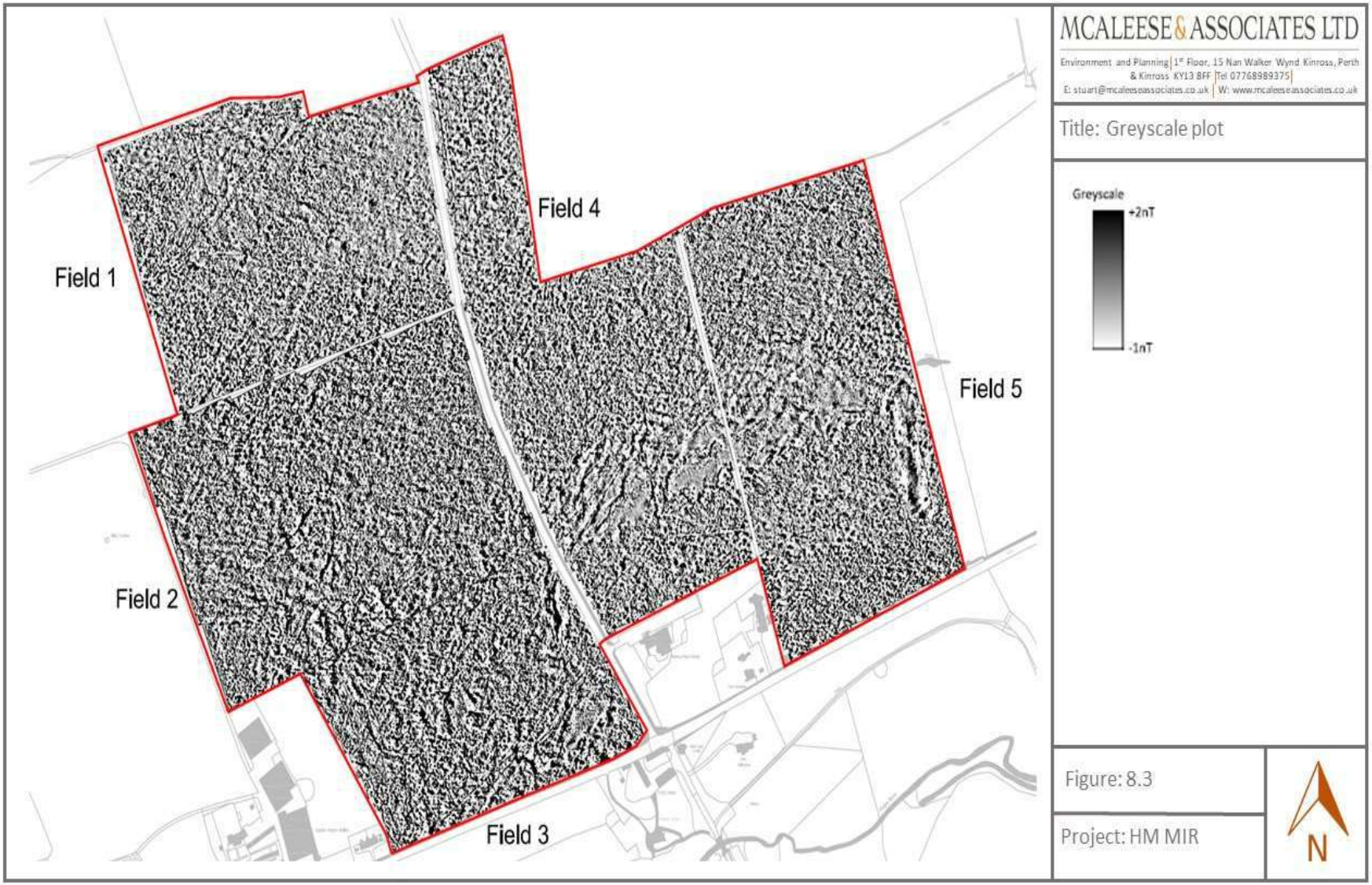
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Field 4
Field 5
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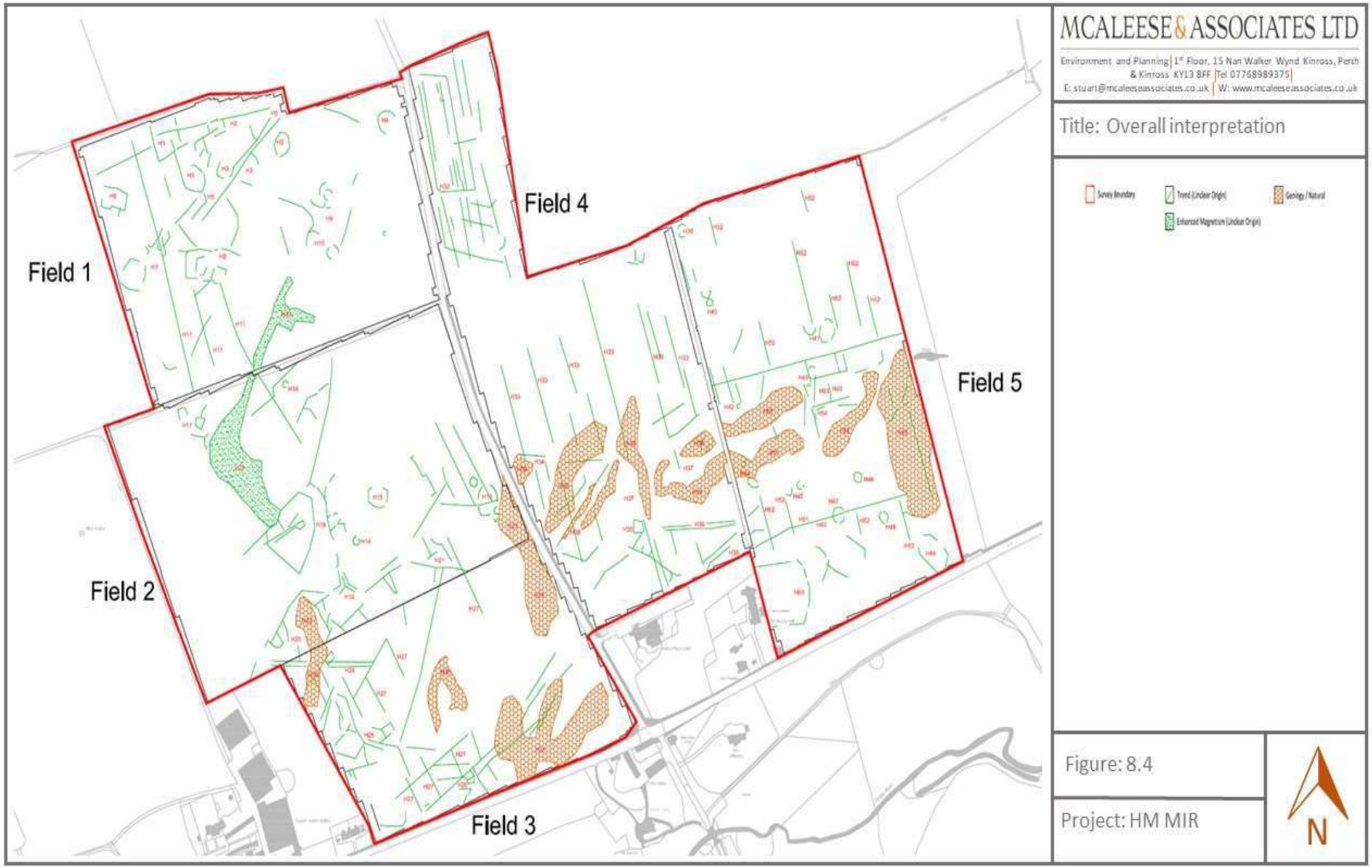
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E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
Title: Overall interpretation
Survey Boundary
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Geology / Natural
Enhanced Magnetism (Unclear Origin)
Figure: 8.4
Project: HM MIR
N

Chapter 9

Biodiversity and Ecology

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Chapter 9 Ecology and Biodiversity

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9 Ecology and Biodiversity

9.1 Introduction

This Chapter of the EAR Report evaluates the effects of the proposed development on ecological and ornithological interests. The assessment identifies potential effects arising from the operation of the proposed development on: protected species; habitats; and designated sites. This assessment was undertaken by McAleese & Associates (UK) Ltd.

9.2 Legislation, Policy and Guidance

The following legislation has been taken into account when undertaking the assessment:

- European Council Directive 2009/147/EC on the Conservation of Wild Birds (the 'Birds Directive');
- European Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna (the 'Habitats Directive');
- Wildlife and Countryside Act 1981 (as amended) (WCA);
- Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the 'Habitats Regulations');
- Wildlife & Natural Environment (Scotland) Act 2011;
- Nature Conservation (Scotland) Act 2004 (as amended);
- Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017; and
- European Council Directive 2000/60/EC ('Water Framework Directive').

The following policies and guidance documents have been referred to and taken into account during this assessment:

- Scottish Planning Policy (SPP) (Scottish Government) 2014;
- UK Post 2010 UK Biodiversity Framework;
- Scottish Biodiversity List Version 1.4 (Biodiversity Scotland, 2012);
- Planning Advice Note (PAN) 1/2013 – Environmental Impact Assessment (Scottish Government, 2013);
- Planning Circular 1/2017Environmental Impact Assessment Regulations;
- PAN 60: Planning for Natural Heritage (Scottish Government, 2000);
- Edinburgh Local Development Plan (2016); and
- Edinburgh Local Biodiversity Action Plan (LBAP).

The following guidance has been taken into account:

- Chartered Institute of Ecology and Environmental Management (CIEEM) (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland;
- SNH (2018). Environmental Impact Assessment Handbook (5th Edition);
- Cresswell, et al. (2012). UK BAP Mammals Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation;
- Harris & Yalden (2008). Mammals of the British Isles: Handbook; and
- JNCC (2010) Handbook for Phase 1 Habitat survey: a technique for environmental audit.

9.3 Consultation

A scoping response was received from The City of Edinburgh Council and Scottish Natural Heritage and their comments and the response are detailed in Table 9.1.

Summary of SNH Comment	Response to consultee
The proposed assessment in relation to ecology and nature conservation will provide a comprehensive assessment of all direct, indirect and cumulative effects of the proposal on the ecology and natural heritage within the site area in consultation with SNH. Advice is attached.	These elements are considered fully within the EAR.

The EIA should consider the broad context of existing green infrastructure assets in the area and to consider how the site proposals and the environmental mitigation proposed within the development site could help support wider strategic natural heritage objectives.	These are presented within the EAR.
Summary of CEC Comment	**Response to consultee**
The overall scope of assessment is acceptable. However, as the site has the potential to impact on supporting habitat for pink footed geese, a species included as a qualifying feature of the Firth of Forth SPA, sufficient information must be submitted in relation to the use of the site by this species, to allow the council to undertake a Habitat Regulation Appraisal.	A Habitat Regulations Assessment has been carried out and reported within the EAR.
The Edinburgh Local Development Plan and Edinburgh Biodiversity Action Plan 2016-18. The Edinburgh Design Guidance should also be referenced.	Noted.
It would also be expected that any ES coming forward, would include principles on how development of the site would enhance the area for biodiversity through the enhancement of existing site features, as well as the inclusion of green infrastructure.	The site is designed around green infrastructure and to enhance existing geatures.

Table 9.1 Scoping Comments from SNH and CEC

9.4 Scope of Assessment

The geographical scope of the assessment encompasses the application site, and effects have been appraised in relation to baseline ecological and ornithological receptors recorded within the site (Figure 9.1). Beyond the application site, potential effects on statutory designated sites, other sites designated for their nature conservation interest and ancient woodland within 2.5 km have been assessed.

The study area for the assessment of effects on bird populations is the qualifying interests of the Firth of Forth Special Protection Area (SPA) as defined by Scottish Natural Heritage (SNH) Nature Conservation Order NC)2206.

Data has been collected through desktop study, consultation and field surveys. Field surveys were undertaken in August and November 2018 only. Baseline survey results to date are provided in this chapter, followed by an assessment of likely effects on the ecological and ornithological receptors.

The types of potential impacts that may arise from the proposed use of the site and lead to significant effects on ecological interests include:

- Habitat loss due to the construction of buildings and roads;
- Habitat modification/degradation due to changes in habitat cover, land management or hydrology;
- Displacement of sensitive species due to the presence of construction activities and the ongoing presence of residential, commercial and retail units.

Mitigation and enhancement measures are identified. Any anticipated residual effects of the proposed development are then stated.

9.5 Baseline Survey Methodology

9.5.1 Desk Study

A desk study was undertaken to determine the presence of any nature conservation sites within 2.5km.

The desk study involved the use of a number of data sources including web-based data from relevant sources. The following were consulted:

- SNH SiteLink webpages;
- Consultation of historical maps of the land and its surroundings;
- National Biodiversity Network Atlas; and
- Acquisition of data from The Wildlife Information Centre (TWIC).

9.5.2 Field surveys

Protected species surveys and a habitat assessment were undertaken by Nigel Rudd Ecology August 2018. The tree survey was undertaken by Alan Motion Tree Consultats Ltd in October 2018. The invasive weeds survey was conducted by Kleerkut Ltd in October 2018. The pink footed goose survey was undertaken by Kinross Ecology in February 2019. These reports are presented in presented in Appendix D1, D2d3 and D4 respectively. A summary of survey methodology is given in Table 9.2.

Survey	Methodology
Phase 1 habitat survey	The area within the application site was mapped to Phase 1 Habitat standard (JNCC, 2010). The survey was undertaken in August 2018. The Phase 1 Habitat survey method provides a standardised system for classifying and mapping the wider countryside (including urban areas) and ensures that surveys are carried out to a consistent level of detail and accuracy.
Badger	A search for badger *Meles meles* evidence was undertaken within all suitable habitat within the application site. Evidence of badger may include setts (and their status), bedding, scratch marks, paths, prints, guard hairs, latrines, dung and signs of foraging.
Otter	No suitable habitat for otter was found so no specific survey undertaken.
Amphibians	No suitable habitat for amphibians was found so no specific survey undertaken.
Bats (all species)	A preliminary assessment was made of the suitability of accessible buildings and habitats within the application site to support roosting or foraging bat species. Reference was made to Bat Conservation Trust guidelines when categorising the suitability structures for bats (BCT 2016).
Other protected species	Surveyors searched for evidence of the presence of other protected species, e.g. red squirrel *Sciurus vulgaris*, pine marten *Martes martes* and water vole *Arvicola amphibius*.
Trees	Tree species were identified and classed according to the classifications within "BS 5837:2012: Trees in relation to design, demolition and construction".
Invasive Weeds	Survey conducted for presence / absence of Japanese Hogweed, Giant Hogweed and Himalayan Balsam. Presence / absence survey conducted in the species growing season.
Birds	One visit of a breeding bird survey (BBS) was undertaken within the site boundary in November 2018. Survey Methodology for the surveys was based on a scaled down version of the Common Bird Census (CBC) approach including the use of standard British Trust for Ornithology (BTO) species and behaviour codes. All

	accessible areas of the site were walked and regular stops were made to scan and listen for birds.

Table 8.2 – Summary of survey methodology Survey Methodology

9.6 Assessment Methodology and Evaluation

The assessment follows guidelines for ecological impact assessment published by CIEEM (CIEEM 2018) and follows the process set out in the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

Effects are evaluated against the existing baseline conditions. The assessment determines the potential impacts of the proposed development and considers the likelihood of their occurrence. Effect is defined as change in the assemblage of species present or change in the extent of habitat as a result of the proposed development. Where the response of a species population has varying degrees of likelihood, the probability of these differing outcomes is considered.

Where there is a potential effect on a bird population that forms part of the qualifying interest of an internationally or nationally designated site (or where such designation is proposed), i.e. Ramsar sites, SPAs and Sites of Special Scientific Interest (SSSIs) or a site that would meet the criteria for international or national designation, so far as possible, effects are judged against whether the proposed development could significantly affect the site population and its distribution.

Based on the desk study and field surveys an evaluation was undertaken to identify important ecological features, sometimes known as 'Valued Ecological Receptors' (VER), that may be impacted by the proposals.

When assessing the likely significance of impact of the proposed development on VERs, three principal factors are considered:

- the level of nature conservation value;
- the magnitude of the likely effect; and
- the conservation status of species or habitats.

9.6.1 Nature Conservation Value

Nature conservation value is assigned with reference to defined geographical units and the conservation importance of sites, habitats and species populations is related to these units; it is based on the frameworks outlined in Tables 9.3 and 9.4. These frameworks take full or partial account of nature conservation designations that already incorporate a level of geographic importance to sites.

Level of Value	Examples
International	Internationally designated or proposed sites (SPA or SAC); or non-designated sites meeting the criteria for international designation. A significant area of a habitat type listed in Annex I of the Habitats Directive. Sites where species are present in internationally important numbers (>1% of biogeographic population).
National	Nationally designated sites (such as SSSIs, National Nature Reserves, Marine Nature Reserves, Nature Conservation Review Grade 1 sites); or non-designated sites meeting SSSI selection criteria. A site supporting nationally important numbers of a species (>1% of UK population) and/or supplying critical elements of their habitat requirements.
Regional	Sites containing viable areas of threatened habitats of importance within a regional context. A significant area of habitat type listed on the Scottish Biodiversity List (SBL). Species present in regionally important numbers (>1% of regional population); sites supporting viable breeding populations of nationally scarce species and supplying critical elements of their habitat requirements.

Local	Sites meeting the criteria for council area designation (such as LNR or Site of Importance for Nature Conservation (SINC)). Sites containing significant areas of any priority habitat listed on the LBAP. Undesignated sites, or features or species considered to appreciably enrich the resource within the context of the local area (i.e. within 5 km radius from the site). Examples include species-rich hedgerows and ponds. Level of value Examples Sites supporting small populations of species known to be council rarities or included on the LBAP, and/or supplying critical elements of their habitat requirements.
Site	Widespread and common habitats and species that are not rare or notable in a local context.

Table 9.3 – Level of nature conservation value for sites, habitats and protected species Level of value Examples

Level of Value	Examples
High	Species listed in Annex 1 of the EU Birds Directive. Species listed as qualify features on designated sites within connectivity distance to the propsed development. Breeding species listed on Schedule 1, 1A and A1 of the Wildlife and Countryside Act, 1981 (as amended).
Medium	Species on the Birds of Conservation Concern (BOCC) 'Red' list or IUCN 'Red list' – 'Near Threatened' (http://www.iucnredlist.org). Regularly occurring migratory species, which are either rare or vulnerable, or warrant special consideration on account of the proximity of migration routes, or breeding, moulting, wintering or staging areas in relation to the proposed development. Species present in regionally important numbers (>1 % regional population). Low All other species not covered above.
Low	All other species not covered above.

Table 9.4 – Level of nature conservation value for birds Level of value Examples

9.6.2 Magnitude of the likely effect

Effect magnitude takes account of the nature, spatial extent and duration of the predicted impacts. Table 9.5 shows levels of effect magnitude. Effects can also be modified by the temporal magnitude of effect, for example, whether impacts are predicted to continue permanently or have a short-term duration.

Level of Magnitude	Criteria
Major negative	Total or major loss of key elements/features of the baseline conditions such that the post-development elements/features would be fundamentally changed and may be lost from the site altogether. Guide 20-80% of population/habitat lost.
Moderate negative	Loss of or alteration to one or more key elements/features of the baseline conditions such that post development elements/features would be partially changed. Guide 5-20% of population/habitat lost.

Minor negative	Minor shift from baseline conditions. A minor change to base line conditions, but the underlying key elements/features would be similar to pre-development. Guide 1-5% of population/ habitat lost.
Negligible	A short-term and reversible impact. Very slight change from baseline conditions. Guide < 1% of population/habitat lost. Neutral No measurable impact in either direction.
Positive	Impacts which provide a gain for wildlife. This can be between negligible positive to major positive.

Table 9.5 – Level of Effect Magnitude Level of magnitude Criteria

9.6.5 Determining significance

The ecological significance of effects is assessed according to their effect on the structure and function of ecosystems or sites, which may affect site integrity, and/or the conservation status of habitats and species, which is determined by the sum of influences acting on the habitat or species concerned that may affect the long-term distribution and/or abundance within a given geographical area.

For ecosystems and sites, adverse effects on site integrity are considered significant, i.e. impacts arising from the proposed development that result in changes to baseline conditions that are likely to undermine of the integrity of the site will be considered significant effects.

For habitats and species, following the classification of their nature conservation value and consideration of the magnitude of each effect, professional judgement is used to make a reasoned assessment of the likely effect on the conservation status of each potentially affected habitat or species.

Criteria to aid the determination of significance of effects on habitats and species are shown in Table 9.6. In this assessment, any effect deemed to be of minor or negligible significance is considered to be not significant.

Level of Significance	Decription
Major	Detectable changes in regional species populations of Nature Conservation Importance that would have severe effects on conservation status; detectable changes in important habitats that would have severe effects on their conservation status.
Moderate	Detectable changes in regional species populations of Nature Conservation Importance that would likely affect their conservation status; detectable changes in important habitats that would likely affect their conservation status.
Minor	Small or barely detectable changes that would be unlikely to affect the conservation status of regional species populations of Nature Conservation Importance or important habitats.
Negligible	No or non-detectable changes in the conservation status of regional species populations of Nature Conservation Importance or of important habitats.

Table 9.6 – Significance criteria Level of Significance Description

Significant effects on VARs should be mitigated (or compensated for) in accordance with the scale relevant to the value of the feature or resource. Any significant effects remaining after mitigation (the residual impacts) are outlined where relevant. Recommendations in line with best practice guidance have also been made.

9.7 Baseline Survey Results

This section describes the baseline survey results.

9.7.1 Desk Survey Results

No internationally designated sites were found within 2.5km of Hatton Mains.

No UK designated sites were found within 2.5km of Hatton Mains.

There were three locally designated sites found within 2.5km of Hatton Mains. These are:

- The Gogar Burn – Hatton Bridge to Crow Wood Local Biodiversity Site (LBS);
- Greenburn and Gogar Burn to Hatton Bridge LBS. These two sites are contiguous comprising a stretch of the burn corridor. The two sites combine to cover an area of 60ha; and
- Greenburn and Gogar Burn LBS.

These are presented in Appendix 4 of D1.

The habitat group on the site as listed by TWIC is 'Miscellaneous'. This is presented in Appendix 4 of D1.

There were two records of badgers within 1km of the site form information provided by the NBN Atlas and the TWIC.

There were no records of otter or amphibians within 1km of the site.

The Inventory of Ancient Woodland shows ancient or semi natural woodland in the Gogar Burn area. No Ancient Woodland is on or adjacent to the site. The woodland belt immediately abutting the site on the east is listed as long-established plantation. This is presented in Appendix 4 of D1.

The NBN Atlas has records of Daubentons, Common and Soprano bats within 1km of the site.

There are no records of breeding birds on the site.

9.7.2 Field Survey Results

A number of surveys were undertaken on the site to check for evidence and use by specific species.

9.7.2.1 Habitat

The field survey was undertaken in by Nigel Rudd Ecology in August 2018. The report is presented in Appendix D1. The results of the Phase 1 survey are shown in Figure 9.1.

The land proposed for development is entirely arable farmland and divided into five fields. There is very narrow marginal habitat along the field boundaries. There are stone walls on the east and south boundaries of the north-west field.

There are intact hedges on the west of the site and defunct hedges on the east. Dalmahoy Road is bounded on both sides by intact hedges.

The arable fields were either recently harvested for cereals or recently ploughed. Each field has some shallow headland which supported neutral grass and scattered herbaceous plants. The habitat had a simple structure, was species poor and intensively farmed.

Neutral grass forms a narrow fringe around the fields. The plant community is species poor, simple in structure and affected by biocide and fertilizer treatment. The habitat as value as low grade linear habitat.

The dominant hedge species is hawthorn. Most of the hedges are single species but in places sycamore, beech and alder occur. The hedges had been cut before the survey was undertaken. The habitat has similar value to neutral grass as a low-grade linear habitat.

The ditch on the north-west boundary of the site is culverted to the east. The is no surface connection with downstream water courses. The ditch comprises a 1.5m trench with a very shallow and narrow water channel. The bank supports neutral grasses and tall, ruderal species.

The sites habitat diversity is low.

9.7.2.2 Ground Water Dependent Terrestrial Ecosystems (GWDTE)

No evidence was found of GWDTE within the site boundary.

9.7.2.3 Protected Terrestrial Mammals

The site was inspected for evidence of use by badger (*Meles meles*). The report is presented in Appendix D1. Signs looked for included:

- setts;
- day beds;
- latrines;
- snuffle holes;
- paths;
- scratching posts;
- hair; and
- footprints and tracks.

The NBN Atlas and TWIC hold records of badger within 1km of the site. However, these records are for locations remote form this site and separated by main roads and habitat unsuitable for badger to be active within.

The field survey confirmed that there was no significant habitat potential for great crested newts (*Triturus cristatus*), otter (*Lutra lutra*) or water vole (*Arvicola terrestris*).

9.7.2.4 Bats

An initial assessment was made as to the suitability of any habitats to support bat (*Chiroptera*) populations. The report is presented in Appendix D1.

The woodland habitat identified was checked along its fringes for any signs of bat (*Chiroptera*) use. This included a visual inspection for:

- droppings;
- polishing, scratching or staining which may indicate use for roosting;
- live or dead bats (*Chiroptera*); and
- any insect remains which may indicate feeding;

There was negligible roost potential identified for bats (*Chiroptera*) on the site.

There was no signs of bat (*Chiroptera*) use identified during the survey.

9.7.2.5 Trees

The tree survey was undertaken by Alan Motion Tree Consulting Ltd in October 2018. The report is presented in Appendix D2 and Appendix D2a.

Trees are confined to field boundaries. The eastern shelterbelt contains mature specimens of beech and ash with occasional Scots pine and oak. There are two good specimens of oak on the western boundary within a hawthorn hedgerow. To the west of Dalmahoy Road along the northern boundary there are a few specimens of ash and elm of poorer quality within the unmaintained hedgerow along the line of the watercourse. Further poor stems of ash are present along the western Dalmahoy Road verge.

Field boundaries are marked by maintained hawthorn hedgerows. Some young tree planting is present within hedgerows along the western edge of Dalmahoy Road and along the central east-west hedgerow in the west of the site.

Mature trees are present within the grounds of the Ratho Park Hotel and along the eastern edge of St Marys Hall.

9.7.2.6 Invasive Species

The site was surveyed by Kleerkut Ltd in October 2018. The report is presented in Appendix D3. The survey was a visual presence / absence survey for

- Japanese Hogweed (*Reynoutria japonica*);
- Giant Hogweed (*Heracleum mantegazzianum*); and
- Himalayan Balsam (*Impatiens glandulifera*).

No evidence was found of these invasive species.

9.7.2.7 Birds

Bird species were noted during the Phase 1 survey. However, no specific bird survey was undertaken in terms of breeding bird survey or wintering bird survey.

As the site lies in proximity to the Firth of Forth Special Protection Area (SPA). Consequently, a Habitat Regulations Appraisal was required. This consisted of undertaking survey for pink footed geese (*Anser brachyrhynchus*) on three mornings in early February 2019.

No birds were observed foraging on the site.

There were a number of locations across the site where feathers and other indicators of use were found.

Some birds were observed in flight and these were noted.

The HRA is presented in Appendix D4 of this report.

9.8 Ecological Impact Assessment

This section of the EAR assesses the ecological impacts of the proposed development against the receptors identified in the surveys.

9.8.1 Vulnerable Ecological Receptors (VERs)

The VERs found within or adjacent to the site are listed in Table 9.7 below.

Feature	Sensitivity	Conservation Status
Broadleaved woodlands	High	Ancient woodland
Buildings / trees suitable for roosting bats	High	European Protected Species and Scottish Biodiversity List Priority Species
Pink footed geese	Medium	Qualifying interest of the Firth of Forth SPA
Trees of A & B status		Important for wildlife assemblages

Table 9.7 – VERs within and adjacent to the site

9.8.2 Potential Impacts

A number of adverse impacts will occur on the ecological resources on the site, through both the construction and operational phase of the development. There will also be the opportunity for beneficial ecological impacts to realised within the site as embedded mitigation whereby the mitigation and enhancement is built into the design of the development.

Tables 9.8 and 9.9 illustrate the potential impacts which could be expected from the development as designed which includes ecological enhancements. Nevertheless, there is a precautionary approach taken and in the absence of evidence (at this early stage for the development process) assumes a reasonable worse-case scenario.

VER	Impact	Severity	+ / -	Direct / indirect	Duration	Significance
Broadleaved woodlands	Removal of trees	Minor	-	Direct	Permanent	Minor
Bats	Security lighting	Moderate	-	Direct	Temporary	Minor
	Disturbance	Minor	-	Direct	Temporary	Minor
Pink footed geese	Loss of habitat	Minor	-	Direct	Permanent	Minor
Trees of A & B status	Very limited removal with focus on least healthy trees within the site	Minor	-	Direct	Permanent	Minor
Ecological connectivity	Potential fragmentation	Moderate	-	Direct / indirect	Permanent	Moderate

Table 9.8 – Construction impacts

VER	Impact	Severity	+ / -	Direct / indirect	Duration	Significance
Broadleaved woodlands	Degradation due to increased presence of people	Moderate	-	Direct	Permanent	Moderate
Bats	Introduction of buildings and increased lighting	Moderate	-	Direct	Temporary	Moderate
	Disturbance to foraging activity	Moderate	-	Direct	Temporary	Moderate
Pink footed geese	Loss of habitat	Minor	-	Direct	Permanent	Minor
Trees of A & B status	No impact	Negligible	-	Direct	Permanent	Negligible
Ecological connectivity	Enhanced green networks and connectivity	Moderate	+	Direct / indirect	Permanent	Moderate

Table 9.9 – Operational impacts

9.8.3 Mitigation

This section concentrates on the potential impacts that have been graded moderate significance or higher. As the EIA process has been central to informing the design of the development, this section will:

- Highlight the main significant potential impacts identified;
- Identify how these potential impacts have been mitigated in the design process; and
- Identify any further mitigations that will be needed throughout the development of the site.

This Section will identify mitigation through design and mitigation that should be required as planning requirements for both the construction and operational phases of the development.

9.8.3.1 Construction Mitigation

Mitigation during construction will be managed via planning conditions. Typically, this will include provision of the following:

- Construction Environment Management Plan (CEMP);
- Ecological Management Plan (EMP);
- Pre-construction ecological survey; and
- Provision of an Ecological Clerk of Works to oversee the construction phase;

Mitigation and residual impacts are shown in Table 9.10 below.

VER	Potential Impact	Mitigation	Type	Confidence	Residual
Ecological connectivity	Potential fragmentation of habitats used as corridors by wildlife	Standoff from existing woodland belts, no removal of vegetation during breeding season	Avoidance	High	Negligible

Table 9.10 – Construction mitigation and residual impacts

9.8.3.2 Operational Mitigation

Once the site is built, there will be a fundamental change to the nature and character of the site. The Masterplan embraces the most up-to-date best practice in ecological enhancement and design which will ensure the ecological integrity of the site is enhanced. The addition of high-quality greenspace with an emphasis on protecting vulnerable species will result in a new improvement to the site.

Mitigation and residual impacts are shown in Table 9.11 below.

VER	Potential Impact	Mitigation	Type	Confidence	Residual
Broadleaved woodlands	Degradation due to increased presence of people	Management, adaptation and acceptance of features	Design and avoidance	High	Negligible
Bats	Introduction of buildings and increased lighting	Green corridors designed with low level lighting	Direct	High	Negligible
	Disturbance to foraging activity	Enhancement of corridor features, avoidance and standoff from existing woodlands	Design	High	Negligible

Table 9.11 – Operational mitigation and residual impacts

9.9 Summary, Residual Impacts and Commitments

9.9.1 Residual Impacts

The EIA process has shown that there will be some negligible impact on habitats and species. However, these are **not significant** and **not adverse**.

9.9.2 Commitments

The development will be managed through the construction period by planning conditions typically covering the range of best practice and environmental management measures which are used at that point.

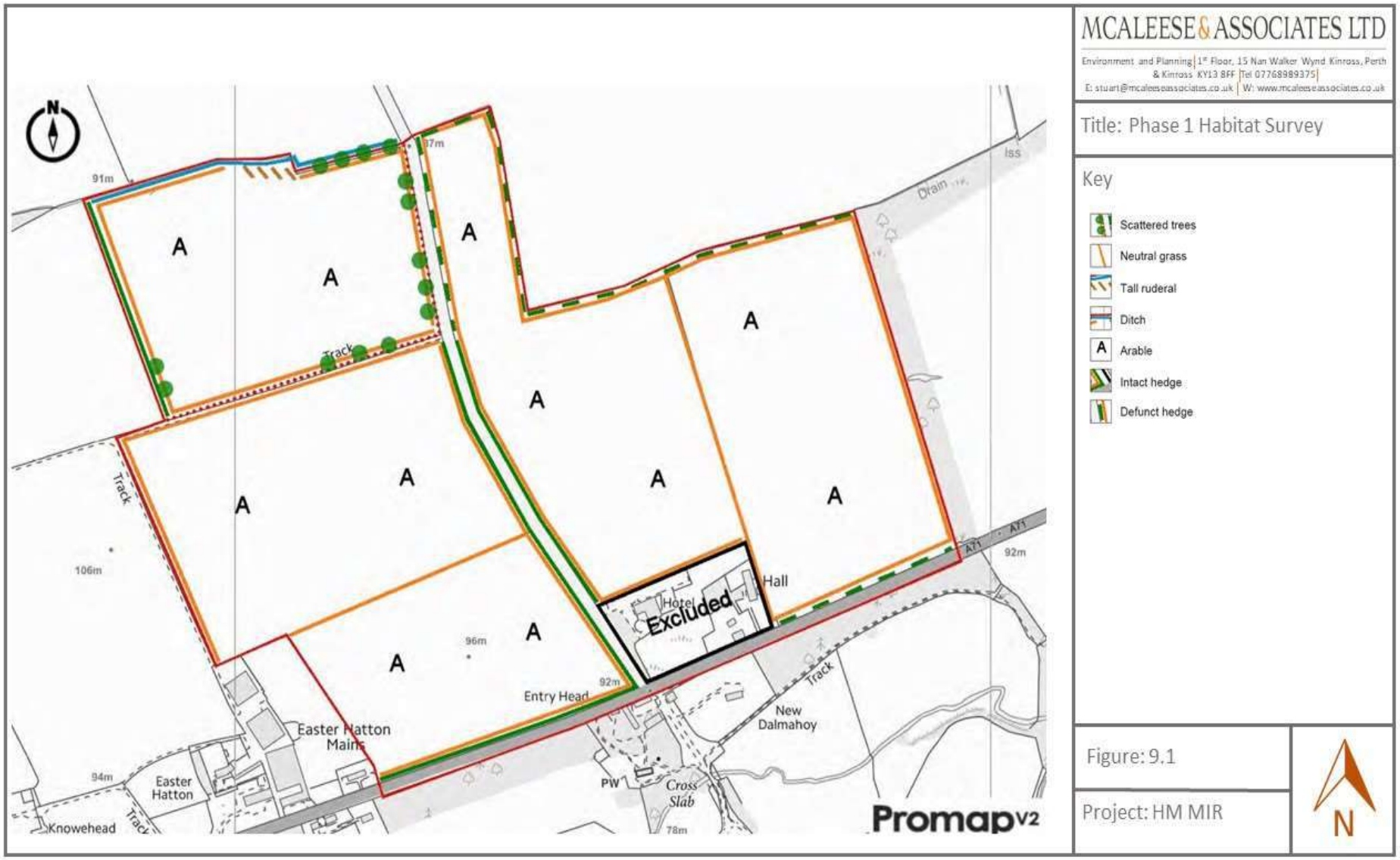
9.9.3 Summary

The site has a range of low value, low productivity habitats due to the current use for agricultural farming.

There are no sensitive habitats or sensitive species on the site.

The site has a range of mitigation built into the design of the proposed development.

Residual impacts are negligible.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Title: Phase 1 Habitat Survey
Key
Scattered trees
Neutral grass
Tall ruderal
Ditch
A Arable
Intact hedge
Defunct hedge
Figure: 9.1
Project: HM MIR
N
A
Track
Drain
Excluded
Hotel
Hall
Entry Head
New Dalmahoy
Easter Hatton Mains
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91m
87m
106m
96m
92m
94m
78m
Promap V2

10

Chapter 10

Soils and Geology

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Chapter 10 Soils and Geology

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10 Soils and Geology

10.1 Introduction

10.1.1 Introduction

This chapter describes the potential effects of the proposed Hatton Village development on geology and soils in the local area. This chapter has been informed by the following technical studies:

- Geoenvironmental Desk Study (Mason Evans, 2018);
- Stage 1 Land Contamination Report (GM Civil & Structural Consulting Engineers, 2017); and
- Drainage and Engineering Assessment (GM Civil & Structural Consulting Engineers, 2020).

These reports are presented in Appendix E.

This chapter has been produced in full recognition of consultee and public input during the consultation procedures, outlined in Chapter 5 (Environmental Assessment) and should be read with reference to Chapter 3 (The Proposed Development) and, particularly, Chapter 11 which focuses on hydrological impacts.

10.1.2 Scope of the Assessment

Baseline desk-based assessments have been completed to inform this chapter of the EAR. The methods used conform to industry standard for this type of work. It is anticipated that a full intrusive Site Investigation will be undertaken as part of the work to accompany a detailed planning application for the site.

This application is based on a conceptual Masterplan and there is no detailed housing layout available for the site. Accordingly, this assessment aims to identify constraints from existing and proposed activities that could impact negatively on existing soils or the underlying geology, especially with regards to historical contaminants release and to ensure that these are taken into account when determining the proposed land uses.

10.2 Legislation and Policy

10.2.1 Legislative Context

Environmental Protection Act (EPA) 1990 as amended by the Environment Act 1995 iv Part 2A

The UK legislation on land contamination is principally contained in Part 2A of the Environmental Protection Act, 1990.

This legislation endorses the principle of a "suitable for use" approach to contaminated land, where remedial action is only required if there are unacceptable risks to health or the environment, taking into account the use of the land and its environmental setting.

This statutory guidance describes a risk assessment methodology in terms of "significant pollutants" and "significant pollutant linkages" within a source-pathway-receptor conceptual model of a site. The model comprises:

- The principal pollutant hazards associated with the Site (the sources);
- The principal receptor(s) at risk from the identified hazards; and
- The existence, or absence, of plausible pathways which may exist between the identified hazards and receptor(s).

For land to be determined to be statutorily "contaminated" and require remediation or a change to a less sensitive use, all three elements (source-pathway-receptor) of a significant pollutant linkage must be present. The possibility of significant harm to one, or all of a number of, identified receptors should be demonstrated.

10.2.2 Policy Context

National Planning Policy

National Planning Framework 3

The National Planning Framework3 (NPF3) was developed to set out the context of development planning in Scotland and is designed to provide a framework for the spatial development of Scotland as a whole. The document sets out the Government's development priorities over the next 20-30 years, identifying national developments which support the development strategy.

Scottish Planning Policy

Scottish Planning Policy (SPP) sets out national planning policies which reflect Scottish Ministers' priorities for operations of the planning system and for the development and use of land. Key Planning outcomes for Scotland include the following:

- A successful sustainable place supporting economic growth, regeneration and the creation of well-designed places;
- A low carbon place, reducing carbon emissions and adapting to climate change;
- A natural resilient place helping to protect and enhance the natural cultural assets and facilitating their sustainable use; and
- Supporting better transport and digital connectivity.

SPP promotes consistency in the application of policy across Scotland whilst allowing for sufficient flexibility to reflect local circumstances and directly relates to the preparation of development plans, the design of development from initial conception through to delivery and the determination of planning applications and appeals. With reference to potentially contaminated land, development management decisions should consider potential effects on landscapes, the natural and water environment, including cumulative effects. Developers should seek to minimise adverse impacts through careful planning and design. Primary objectives should be to protect the natural and built environment and maximise the potential for enhancement. Protection and enhancement should be achieved by avoiding over-development, protecting the amenity of new and existing development and considering the implications of development for water, air and soil quality, reducing waste and facilitating its management, as well as promoting resource recovery.

10.3 Methodology

10.3.1 Study Area

The study area with respect to the baseline assessment refers to the superficial deposits, geological strata and groundwater bodies located within the boundary of the Site.

10.3.2 Methodology of Assessment

The assessment was initiated based on a preliminary desk-based study of the ground conditions based on research of available geological data. This was followed by more detailed research involving data acquisition and examination of various documents of the geological and historical background to the Site. The results were interpreted in accordance with current guidelines, relative to the Proposed Development.

The following sources of information have been referred to in this section of the EIA Report:

- Field walkover survey undertaken by a Mason Evans Engineer (September 2018);
- Scottish Environment Protection Agency (SEPA) Information;
- Envirocheck Report (containing historical mapping);
- Coal Authority information;
- Record of Historical Boreholes;
- Memoirs of the Geological Survey Scotland '*The Oil Shales of the Lothians'*;
- Geoenvironmental Desk Study (Mason Evans, 2018);
- Stage 1 Land Contamination Report (GM Civil & Structural Consulting Engineers, 2017); and
- Drainage and Engineering Assessment (GM Civil & Structural Consulting Engineers, 2020).

As outlined in 10.2.1, for land to be determined to be statutorily "contaminated" and require remediation or a change to a less sensitive use, all three elements (source-pathway-receptor) of a significant pollutant linkage must be present. The possibility of significant harm to one, or all of a number of, identified receptors should be demonstrated. The pathways by which sensitive receptors may be exposed to potential sources of contamination can be by air through windborne dust (inhalation), direct contact through handling (dermal) or ingestion. Groundwater systems can be impacted through leaching of contamination from soils or other impacted groundwater bodies. Flora receptors (garden areas) can be impacted through uptake of contaminants in the root system.

The source-pathway-receptor linkage can be manifested within the Site through the following situations:

- Generation of dust during construction (earthworks) operations (human and fauna);
- Dermal and ingestion contact through construction (earthworks) operations (human and fauna);
- Dermal and ingestion in domestic gardens – new development householders (human and fauna);
- Maintenance workers in contact with contaminated soils through excavation (human);
- Leaching of contaminated soils placed in earthworks (groundwater and fauna);
- Accumulation of gases in confined spaces (explosive and suffocation risk) (human); and
- Uptake in plants through root system (flora and human).

It should be recognised that some of these risks currently prevail at the Site and that contaminated soils exist at surface across localised areas in the south and centre of the Site. Therefore, there is the opportunity for the Proposed Development to mitigate the risks through design.

10.3.3 Assessment Criteria

Sensitivity criteria for hydrogeology and geology are outlined in Table 10.1. The magnitudes of effects are assessed based on the criteria presented in Table 10.2. These criteria are based on professional judgement and experience of other similar studies.

The predicted significance of any likely significant effects was determined through a standard method of assessment based on professional judgement, considering both sensitivity and magnitude of change as per Table 10.2.

Major and moderate effects are considered significant in the context of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (EIA Regulations).

Sensitivity	Hydrogeology	Geology
High	Environment is subject to major change(s) due to impact. Water body is classified by SEPA as being High-Good status or is close to the boundary of a classification: Moderate to Good or Good to High. Receptor is used for public and/or private water supply (including Drinking Water Protected Areas). Groundwater vulnerability classified as high.	Environment is subject to major change(s) due to impact. Nationally designated sites such as SSSIs, or non-designated sites meeting SSSI selection criteria. Soil type and associated land use is highly sensitive.
Medium	Environment clearly responds to effect(s) in quantifiable and/or qualitative manner. Water body is classified by SEPA as being Moderate. Moderate classification of groundwater aquifer vulnerability.	Environment clearly responds to impact(s) in quantifiable and/or qualitative manner. Soil type and associated land use is moderately sensitive (e.g. commercial forestry, arable).

Sensitivity	Hydrogeology	Geology
Low	Environment responds in a minimal way to effect such that only minor change(s) are detectable. Water body is classified by SEPA as being Poor or Bad. Receptor not used for water supplies (private or public).	Environment responds in a minimal way to effect such that only minor change(s) are detectable. Soil type and associated land use not sensitive to change (e.g. grazing of sheep and cattle).

Table 10.1: Criteria to assess sensitivity for hydrogeology and geology

Magnitude	Hydrogeology	Geology
Major	A change that results in a permanent or long-lasting (months) impact on the quality or quantity of a groundwater body that renders it unusable.	Total loss of, or alteration to, key features of the baseline environment such that post development characteristics or quality would be fundamentally or irreversibly changed.
Moderate	A change that results in an impact on quality or quantity of a groundwater body that renders it unusable for days or weeks, with no alternative source provided.	Loss of, or alteration to, key features of the baseline resource such that post development characteristics or quality would be partially changed.
Minor	A change that results in an impact on quality or quantity of a groundwater body that renders it unusable for a short period (days) and where the potential for impact has been communicated in advance, or where water is unusable for a longer period but where an alternative has been put in place.	Small changes to the baseline resource which are detectable, but the underlying characteristics or quality of the baseline situation would be similar to predevelopment conditions.
Negligible	No impact on quality or quantity of water supply or change that results in short-term (days) effect where an alternative has been put in place.	A very slight change from the baseline conditions, which is barely distinguishable.

Table 10.2: Criteria to assess magnitude for hydrogeology and geology

The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the impacts can be beneficial or adverse. The Effect Significance Matrix is set out in Table 10.3.

Magnitude	Sensitivity		
	High	Moderate	Low
Major	Major Adverse/Beneficial	Major - Moderate Adverse/Beneficial	Moderate - Minor Adverse/Beneficial
Moderate	Major - Moderate Adverse/Beneficial	Moderate – Minor Adverse/Beneficial	Minor Adverse/Beneficial
Minor l	Moderate - Minor Adverse/Beneficia	Minor Adverse/Beneficial	Minor Adverse/Beneficial - Negligible
Negligible	Negligible	Negligible	Negligible

Table 10.3: Effect Significance Matrix

The effect of Moderate Adverse/Beneficial significance or greater is considered to be significant in EIA terms.

10.3.4 Limitations and Assumptions

The assessments of the overall Site area have been undertaken based upon research of documentary information. The assessments site area proposed for residential development have been carried out through research of documentary information and a site walkover only. No intrusive investigations have been undertaken.

10.4 Baseline

10.4.1 Designated Sites

There are no known Regionally Important Geological Sites (RIGs)/Local Geodiversity Sites, Ramsar sites, Special Areas of Conservation, Special Protection Areas or Sites of Special Scientific Interest (SSSIs) within the Site or within 5km of the Site.

10.4.2 Historical Land Use

An examination of the history of a site can often provide valuable information relating to potential constraints to its development. To facilitate these investigations, copies of historical Ordnance Survey maps contained within the Envirocheck report (Appendix D1) and other historical data were examined, with particular attention being focused on former site uses and the presence of any industrial processes in the vicinity of the study area. This is summarised in Table 10.4 below.

OS Map Edition	The Site	Surrounding Area
1853-55 (1:10,560)	The site is unoccupied agricultural land.	St. Mary's School is recorded to the immediate south of the site. The surrounding 1 km radius is generally unoccupied agricultural land with occasional roads and cottages. 'Quarry' recorded 1 km to the north-west and 800m south-east of the site. 'Ratho Quarry' recorded 1.25 km to the northwest.
1894-95 (1:2,500) 1895 (1:10,560)	No significant changes recorded.	'Parsonage', 'Entry head' and 'Gateside' are recorded to the immediate south of the site. 'Old Quarry' is recorded 500 m to the south of the site. 'Old Sand Pit' is recorded 66 m to the south of the site. 'Deer Park' is recorded 500 m to the south of the site area. 'Reservoir' 1 km to the north-west. 'Fish Pond' recorded 300 m to the south of the site.
1907 (1:2,500) 1909 (1:10,560)	No significant changes recorded.	'Craigpark Quarry' is recorded 1.2 km to the north-west. Sewage tanks are recorded 600 m north-east and 750 m north of the site area. 'Smithy' and 'Gas Works' are recorded 1 km to the north of the site. 'Cistern' is recorded 950 m to the north west of the site area. 'Boathouse' and 'Kennels' are recorded 350 m to the south of the site.
1913 (1:2,500) 1915 (1:10,560)	No significant changes recorded.	No significant changes recorded.
1938 (1:10,560)	No significant changes recorded.	No significant changes recorded.
1957 – 1958 (1:10,000)	No significant changes recorded.	Golf courses recorded 500 m to the south and 600 m to the north east of the site. No other significant changes were recorded.

OS Map Edition	The Site	Surrounding Area
1963-69 (1:2,500) 1966 (1:10,000)	No significant changes recorded.	Significant residential development around Ratho. No other significant changes were recorded.
1978 (1:2,500) 1973-77 (1:10,000)	No significant changes recorded.	'Ransfield' and 'Ratho Mains' cottages recorded 200m to the north of the site area. 'Knowhead' and 'Bridge End' cottages recorded 350 m to the south-west of the site area. No other significant changes were recorded.
1980-84 (1:10,000)	No significant changes recorded.	Significant residential development around Ratho. No other significant changes were recorded.
1991-95 (1:10,000)	No significant changes recorded.	No significant changes recorded.
1993 (1:2,500) 1999 (1:10,000)	No significant changes recorded.	Further residential development around Ratho. No other significant changes were recorded.
2018 (1:10,000)	No significant changes recorded.	No significant changes recorded.

Table 10.4: Summary of OS Map findings

It should be noted that considerable periods of time have elapsed between successive Ordnance Survey map editions and the possibility that further land uses occurred in the intervening years, which were not recorded on the maps, cannot be discounted.

A review of the site history indicates the site has been unoccupied agricultural land since 1853. Several quarries were recorded within 1.5 km of the site boundaries.

The surrounding area is indicated to have been occupied by predominantly agricultural land, recreational areas and residential properties. Development to the village of 'Ratho' to the north has undergone significant residential expansion since the 1960's.

10.4.3 Mining and Quarrying

The northern, eastern, southern and central site area is recorded to be located within a 'Coal Mining Reporting Area', and as such consultation was undertaken with The Coal Authority to gain more information on historical coal mining activities below the site. report provided by The Coal Authority (Appendix E1), states that the property is '*not within a surface area that could be affected by known past underground mining*'. Importantly, The Coal Authority does not make mention of the likelihood for unrecorded shallow mine workings.

The Coal Authority report does not record any known coal mine entries within, or within 20 m of the site boundary. In terms of mine gas emissions, The Coal Authority report notes it has '*no record of mine gas emissions requiring action'*. This further supports the conclusion that there is no record of coal mining activities within the site, or surrounding site area.

A review of the Memoirs of the Geological Survey Scotland *'The Oil-Shales of the Lothians'* (Appendix E1) book provided further information on the Dalmahoy Shale. The memoirs indicate that the seam is not widespread and has only been recorded in the indicated locality and won't be widespread throughout the area. The memoirs indicate that the seam had been historically investigated for extraction potential, however no subsequent operations were undertaken, and the seam was not wrought (worked).

A review of the stratigraphic column (Drawing No P18/320/DS/R/F/04 in Appendix E1), indicates the 'Dalmahoy Shale' to underlie the 'Pumpherston Shale' Group. Though the precise vertical separation

is not known, it is indicated from the memoirs that there is a 'considerable' distance between the Dalmahoy and the Pumpherston Group.

A review of the available historical Ordnance Survey maps indicated that there were no quarrying activities within the site or immediate surrounding area (i.e 250 m).

As such, and with cognisance to the above, we do not consider the site to be at any potential risk from mineral instability as a result of past shallow mine workings (i.e oil-shale or coal) or quarrying activities.

10.4.4 Solid Geology

The British Geological Survey solid geology map (Drawing No. P17/320/DS/R/F/04) indicates the solid strata to consist sedimentary bedrock, belonging to the Carboniferous aged Lower Oil Shale Group, described as sandstones, interbedded with siltstones and mudstones, seams of oil-shale and coal, dipping in an unknown direction.

The survey map conjectures the 'Dalmahoy Shale' to outcrop approximately 75 m to the south-east of the site, dipping to the north (forming part of a syncline). The 'Dalmahoy Shale' is understood to outcrop below the 'Pupherston Shale' Group (recorded to be 115 m thick, consisting three oil shales varying between 4 foot and 6 foot thick), and is indicated to be approximately 8 foot thick. This is the only known locality of the 'Dalmahoy Shale'

The BGS map indicates a geological fault in the central western site area, downthrown to the north. An extrat of the solid and drift geology of the site is shown in Figure 10.1.

10.4.5 Superficial Soils

The engineers site walkover survey (Appendix E1) recorded the site to be in use as agricultural land, consisting crops and surface grass. As such, it is considered that the majority of the site will be underlain by topsoil.

The British Geological Survey geological map (Drawing No. P18/320/DS/R/F/04) indicates the natural superficial deposits below the site to generally comprise glacial till (generally recorded as a sandy, gravelly CLAY), with localised moundy SAND and GRAVEL within the south western site area. Due to the 'greenfield' nature of the site, we do not expect significant made ground deposits to underlie the site.

Historical boreholes from the surrounding area (i.e >200 m) support the geological survey map. Rockhead is recorded to be generally shallow within the surrounding area, recorded at depths between <1.00 m and 4.00 m bgl.

10.4.6 Hydrogeology and Hydrology

Interpretation of the site hydrogeology required consideration of the general geological conditions. In this instance the available information indicates the ground conditions to be potentially comprised of four geological units:

- TOPSOIL;
- Glacial Till;
- SAND and GRAVEL deposits; and
- sedimentary bedrock.

At present, surface run-off below the site would be relatively low over the site given that the site was surfaced predominantly in arable crops and grass. Infiltration of surface water would therefore be expected to be high.

It was considered that a shallow groundwater body would not exist within the glacial till deposits on site, due to the low permeability range of cohesive deposits. Groundwater may still be encountered within the glacial till soil underlying the site, though this is likely to be localised and perched, likely the result of surface water infiltration.

Given the moderate infiltration and moderate permeability of the localised SAND and GRAVEL deposits within the south western site area, it was considered possible that shallow groundwater body could exist.

Notwithstanding the above, given the limited range of these deposits (i.e southwestern site area only), we would not consider any groundwater encountered to be representative of a groundwater body, instead this would be localised and perched, likely the result of surface water infiltration.

The potential for a deeper groundwater table below rockhead is moderate given the permeability range of the sedimentary strata. The presence of any potential deep groundwater table would be dependent on secondary porosity, such as fracturing; this would also control any potential movement between shallow and deep lying groundwater bodies. SEPA indicated the bedrock groundwater body to be the 'Livingston'.

The nearest surface water is an unnamed burn located along the northern site boundary. SEPA hold no information on this feature, but we would consider it to be a potential sensitive receptor in terms of the captioned site.

In consideration of the available information regarding groundwater, the following general comments in Table 10.5 could be made.

Surface water run-off	Surface water run-off below the site would be relatively low over much of the site given that it was surfaced entirely in arable crops and grass. Consequently, the infiltration of surface water would therefore expected to be relatively high.
Groundwater mitigation through superficial materials	The site was anticipated to be predominantly underlain by natural cohesive glacial till deposits which would not likely facilitate shallow sub-surface migration of water. As such, it is considered unlikely that a shallow groundwater body would underlie the site.

Table 10.5: Surface water and ground water pathways

10.4.7 Chemical Contamination

Public register information sources were checked for any available information which may lead to reasonable assumption of chemical contamination of the site. This was achieved through the use of a commissioned Envirocheck Report. The results of this are summarized in Table 10.6 below.

Potential Impact Source	Distance (m)	Details	Impact Risk
Mineral sites	-	None indicated within 250m of the site.	LOW
Discharge consents	0	3 within the site associated with drainage and septic tanks.	LOW
Radon	-	No radon protective measures are required as the site resides in a lower probability area.	LOW
Current offsite contamination sources (Active Trade Entries)	-	None noted on site. None noted within 1000m of the site.	LOW
Registered landfills	-	None noted within 250m of the site.	LOW
Fuel station entry	-	None within 1000m of the site.	LOW

Table 10.6: Potential impact sources within 1000m of the site

10.4.8 Future Baseline

No significant change to the baseline conditions are envisaged given the Site history and current land use. It is also noted that the Site is secure.

10.5 Conceptual Site Model

In order to fully evaluate the potential presence and impact of contamination at the site, the area must be considered in an environmental context taking account of its geology, topography, past and present land-use.

From this review, the current guidance requires the development of a 'Conceptual Site Model' as defined in the R & D Publication CLR10 published by the Department for the Environment and Rural Affairs (DEFRA). The model then forms an integral part of the contamination assessment for the proposed development site, looking at conventional source-pathway-receptor linkages.

The key parameters of the model are the conjectured ground conditions at the site, the potential sources of contamination, migration pathways and possible receptors in the vicinity. During the initial stages of the investigation, a preliminary conceptual model can be developed using information obtained during the desk study phase, prior to site investigations being carried out. This should then be revised during a subsequent phase of investigation.

10.5.1 Environmental Qualitative Risk Assessment

Part IIA of the Environmental Protection Act 1990 (inserted by Section 57 of the Environment Act 1995) has created a new regime for the identification and remediation of contaminated land. A revised Statutory Guidance Edition 2 (Paper SE/2006/44) to the Act was published by the Scottish Executive in May 2006.

Both Part IIA and the planning regulations it impacts on, embrace the "suitable for use" approach, with remedial actions only required where there are unacceptable risks to health or the environment, taking into account the current and proposed land uses and its environmental setting.

It is based on the principles of risk assessment, including the concept of a pollutant linkage between a source contaminant and a receptor, by means of a pathway. We would highlight that the approach, while perhaps rendering the site suitable for its current use, may prove inappropriate to a change in site designation or specific land use, arising from existing site conditions.

The presence of all three elements identifies a plausible pollutant linkage. An assessment of the potential sources, pathways and receptors constitutes a conceptual model for the site.

10.5.2 Potential Sources of Contamination

Based on our desk-based research, there are not considered to be any significant sources of contamination which would have an affect the shallow soils or water environment, and therefore the potential for contamination to underly the site is perceived to be **low**.

Notwithstanding the above, given that the site has been open to public access, and given the built-up nature of the surrounding area, we would consider any potential contamination risk (though considered unlikely) to be the result of localised made ground deposits within the site, or contaminant migration from surrounding development works and subsequent usage.

Furthermore, herbicide and pesticide chemicals may have been used during the sites on-going use for agriculture. As such, future site investigations should include for appropriate testing suites.

Potential contaminants of concern are resented in Table 10.7 below.

The Site	Industrial activity / site use	Potential pathways	Associated potential contaminants
Current / previous	Potential localised Made ground. Herbicide/Pesticide use from agriculture.	Deposition of waste arising. Leaching of contaminants to water environment through infiltration and direct discharge. Generation of ground gases.	As, Mg, Cd, Cr, Ni, Zn, Cu, Hg, Pb. Fuel oils, PAH, Phenol, Asbestos, CO_2, CH_4, PCBs. Herbicides/pesticides.

Immediate Surrounding Area	Industrial activity / site use	Potential pathways	Associated potential contaminants
Current / previous	Made ground associated with construction and usage of neighbouring farm steadings.	Deposition of waste arising. Leaching of contaminants to water environment. Ground gas generation and migration. Spillage/leakage of solvents and fuels/oils used in the construction process.	Fe, Al, As, Mg, Cd, Cr, Ni, Zn, Cu, Hg, Pb. Fuel oils, PAH, Phenols, PCBs, Tar, Asbestos, sulphates, phosphates.

Table 10.7: Contaminants of concern

Pathways for the migration of contaminants may be both airborne dispersions (gases and dust) and through the soils, largely in groundwater movements. The movements through the soils can be facilitated by groundwater flows, which should be determined and the connection between different groundwater systems should be assessed. In addition, service trenches, drainage runs, underground storage tanks, former foundations, and other physical features could influence the migration of contamination. As such, these aspects will require to be considered further.

The most sensitive receptors and the pathways by which they may be exposed to potential sources of contamination are as follows:

Human and Ecological Receptors (site end users, visitors and construction operatives)

- Dermal (skin) contact with contaminated soil, fugitive dust and the absorption of any contaminants through the skin into the body;
- Inhalation of fugitive soil dust or vapour;
- Ingestion of soil by hand to mouth activity; and
- Inhalation of any ground gas migrating into the buildings.

Groundwater Receptors (groundwater systems)

- Leaching of contaminants from the soil to groundwater;
- Direct leakage/spillage of contaminants dissolved in the groundwater; and
- Discharge of fluids or soluble wastes direct to soakaways or drains.

Buildings (Existing and proposed buildings and associated infrastructure)

- Contact of building materials with aggressive chemicals or acidic soils.

Public Utilities (domestic water supply, pipes and cables)

- Direct contact with contaminated soil or groundwater;
- Leaching of contaminants through the soil;
- Service trenches acting as preferential migration pathways for contamination; and
- Permeation of plastic water supply pipes.

Vegetation (plants in landscaping)

- Uptake of contaminants from the soil or groundwater into the plant.

Based on the above, a qualitative risk assessment is presented in Table 08 below and the potential source-pathway-receptor relationships, based on the preliminary qualitative risk assessment, are summarised in the Preliminary Conceptual Site Model presented in Figure 10.2.

10.5 Likely significant Effects

10.5.1 Construction Phase

Hydrogeology

The following potential effects on hydrogeology have been identified:

- Pollution of groundwater through operation of machinery (e.g. spillage of fuels, oils etc.) during site preparation and construction of the Proposed Development; and
- Potential effect of concrete batching plant on hydrogeology.

The leaching of contaminants from any fuel/chemical spills during construction poses a potential source of contamination to the underlying groundwater. The glacial till is expected to provide protection to the groundwater in the bedrock where it is present but there are areas of the Site where more permeable soils may exist. Therefore, the sensitivity of underlying groundwater is considered to be low.

The Proposed Development has a negligible magnitude of impact given the anticipated impermeable soils across the majority of the Site, which results in a negligible significance of effect.

Spillage of concrete could potentially affect groundwater receptors beneath the batching plant. Concrete is highly alkaline and has the potential to affect the pH balance of a receptor.

Groundwater bodies are generally not at risk from an erosion/sedimentation event as surface lithography will prevent the transport of sediment into aquifers.

Potential effects of construction activities on the groundwater quality are summarised in Table 10.8 below.

Receptor / Location	Sensitivity	Nature of Impact	Magnitude of Impact	Significance of Effects
Ground water and soils	Low	Pollution of soils and ground water through operating machinery.	Negligible	Negligible
Ground water and soils	Low	Pollution of soils and ground water through concrete spillage.	Negligible	Negligible

Table 10.8: Summary table of preliminary construction impacts (without mitigation)

Geology

The following potential effects on geology have been identified:

- Excavation of soil/rock as part of overall earthworks;
- Excavation of soil/rock at proposed locations of residential and commercial buildings; and
- Excavation of soil/rock along proposed roads.

Areas of significant made ground have been identified, therefore movement of potentially contaminated soils could occur during construction.

Potential effects of construction activities on geology are summarised in Table 10.9 below:

Receptor / Location	Sensitivity	Nature of Impact	Magnitude of Impact	Significance of Effects
Geology (made ground)	Low	Disturbance and movement of contaminants	Moderate	Moderate adverse
Site users	High	Uptake of contaminants through contact / ingestion of soils	Major	Major adverse
Flora and fauna	High	Uptake of contaminants through contact / leaching of soils	Major	Major adverse

Table 10.9: Summary table of preliminary construction effects (without mitigation)

As there are no recorded geological designations relating specifically to the Site, the Site and local area geology can be considered as generally low sensitivity. The impact (without mitigation) from the Proposed Development is considered as moderate adverse in relation to the disturbance and movement of made ground soils, with a change in topography considered as minor adverse in relation to the underlying natural soils. The Proposed Development is considered to have a major magnitude of impact given that the final end-use of the Site is at potential risk from surface instability due to extensive earthworks and soil movement and without appropriate stability measures carried out prior to construction this will result in a major adverse significance of effect.

Contaminated Soils

The identified potentially contaminated soils have the potential to impact on various receptors during and following the construction phase. The made ground contamination source could include toxins which can be detrimental to human health and fauna. Therefore, the identified receptors include humans involved as Site operatives, members of the public in proximity to the area, future Site users, flora and fauna.

10.5.2 Operational Phase

Hydrogeology

It is not anticipated that the Proposed Development will have a significant impact on hydrogeology as no substantial works are expected during the Site operations.

Geology

It is not anticipated that the Proposed Development will have a significant impact on geology during the operational phase as no substantial works are expected during the life of the Proposed Development.

Receptor / Location	Sensitivity	Nature of Impact	Magnitude of Impact	Significance of Effects	
				Opening (Year 1)	Future (Year 15)
Ground water and soils	Low	Pollution through vehicle fuel spillage	Minor	Minor adverse	Negligible
Ground water and soils	Low	Disturbance of soils	Minor	Negligible	Negligible

Table 10.10: Summary table of preliminary operation effects (without mitigation)

10.6 Mitigation

10.6.1 Construction Phase

Standard pollution management measures will be put in place during construction and will be set out in the Construction Environmental Management Plan (CEMP). The management plan will comply with SEPA's Pollution Prevention Guidelines and provide details on the movement of potentially contaminated materials, preventative measures for the control of run-off to surface water receptors, airborne contaminants and fuel spillages. Earthworks will be designed and managed by a geo-environmental engineer. Spill kits will be kept on-site at all times and staff will be made aware of their location and procedures for use.

10.6.2 Operational Phase

At present, no permanent mitigation measures are envisaged at the Site in relation to hydrogeology. Any identified contaminated soils will be capped with suitable inert subsoils and topsoil, with areas generating landfill type gases protected through the installation of suitable preclusion measures

10.7 Residual Effects

10.7.1 Construction Phase

No residual construction effects are considered to be present following mitigation. The overall construction effect is considered to be **negligible**.

10.7.2 Operational Phase

Once mitigation measures are implemented in relation to ground stability, chemical contamination and gas emissions, residual effects are considered to be **negligible**.

10.8 Conclusions

10.8.1 Statement of Significance for Construction

A number of activities have been identified which have the potential to affect the hydrogeology and geology of the Site, primarily related to operations during the construction phase. To reduce the significance of these effects, specific mitigation and management measures are proposed.

With these measures in place it is considered that the significance of the residual effects of the Proposed Development on the hydrogeology and geology of the Site are **negligible** to **minor adverse**.

Hydrogeology

Following mitigation, **no residual effects** on the hydrogeology are predicted.

Geology

Following mitigation, **no residual effects** on the geology are predicted.

Site Users

Following mitigation, **no residual effects** on future site users are predicted.

Vegetation/Fauna

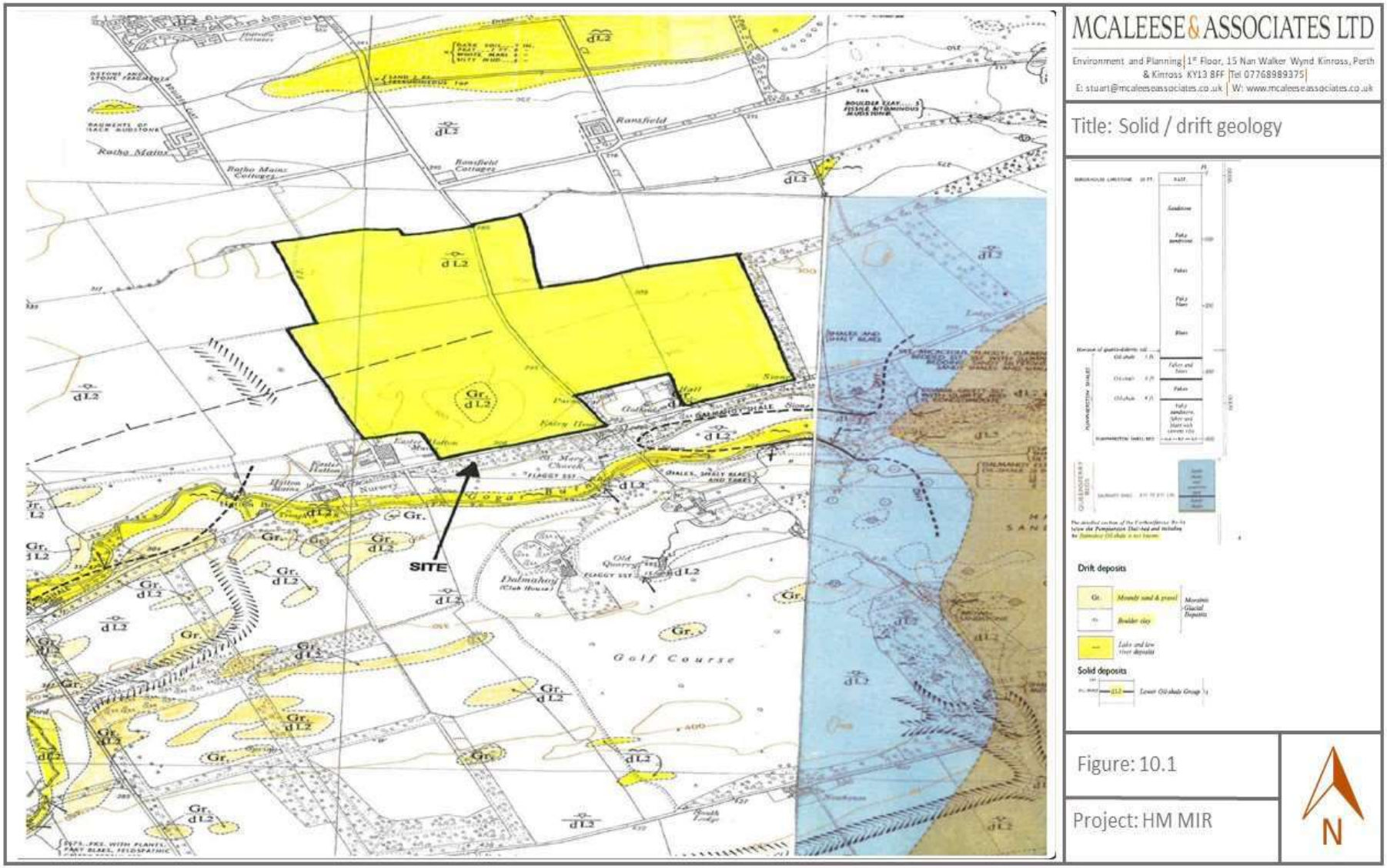
Following mitigation, **no residual effects** on vegetation or fauna are predicted.

10.8.2 Statement of Significance for Operations

Pre-mitigation effects of the Proposed Development on resources, hydrogeology and geology during operations are considered to be negligible. Hence, with mitigation measures in place there are not expected to be any residual effects of the Proposed Development.

10.8.3 Statement of Significance for Cumulative Impacts

Assuming appropriate design and monitoring input has been undertaken for other developments, the cumulative effects on hydrogeology, geology, future site users and vegetation should not be significant. The overall assessment of significance on the geology, hydrogeology, future site users and vegetation is considered to be negligible.


SITE
Golf Course
Ramsfield
Ratho Mains
Ramsfield Cottages
Ratho Mains Cottages
Hatton Mains
Dalmahoy
Old Quarry
MCALEESE & ASSOCIATES LTD
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E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
Title: Solid / drift geology
Drift deposits
Solid deposits
Figure: 10.1
Project: HM MIR
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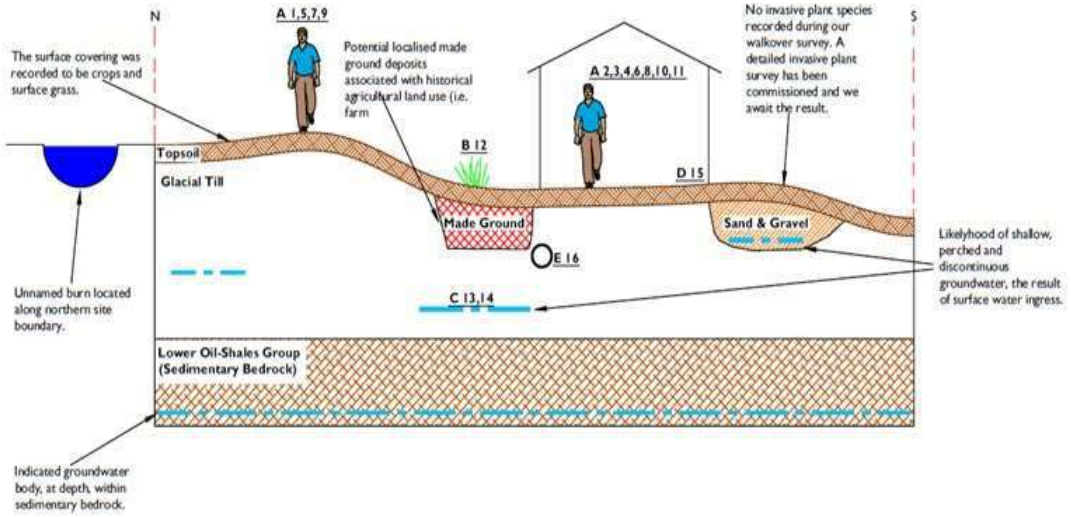

Potential Source

- Potentially contaminated localised made ground.

Potential Exposure Pathways

1. Outdoor ingestion of dust.
2. Indoor ingestion of dust.
3. Consumption of homegrown vegetables.
4. Ingestion of soil attached to vegetables.
5. Skin contact with outdoor soil.
6. Skin contact with indoor dust.
7. Outdoor inhalation of dust.
8. Indoor inhalation of dust.
9. Outdoor inhalation of soil vapour.
10. Indoor inhalation of soil vapour.
11. Inhalation of ground gases.
12. Contaminant uptake by vegetation.
13. Leaching of contaminants to the groundwater.
14. Contaminant migration in the groundwater.
15. Detrimental effects on buried concrete.
16. Permeation of plastic water supply pipes.

Potential Receptors

A. Site users / construction personnel.
B. Vegetation / fauna.
C. Groundwater.
D. Buried concrete (Service and foundations)
E. Plastic water supply pipes.

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Title: Conceptual Site Model

Figure: 10.2

Project: HM MIR

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Chapter 11

Hydrology, Drainage and Flooding

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Chapter 11 Hydrology, Drainage and Flooding

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11 Hydrology, Drainage and Flooding

11.1 Introduction

11.1.1 Introduction

This chapter describes the potential effects of the proposed Hatton Village development on water resources and flood risk in the local area. This chapter has been informed by the following technical studies:

- Flood Risk Assessment (Millard Consulting, November 2018); and
- Drainage and Engineering Assessment (GM Civil & Structural Consulting Engineers, 2020).

These reports are presented in Appendix F.

This chapter has been produced in full recognition of consultee and public input during the consultation procedures, outlined in Chapter 5 (Environmental Assessment) and should be read with reference to Chapter 3 (The Proposed Development) and, particularly, Chapter 1 which focuses on geological and hydrogeological impacts.

11.1.2 Scope of the Assessment

This chapter provides an assessment of the potential for the water environment to be impacted by the Proposed Development. This assessment covers a range of components including, surface water and fluvial hydrology (including flooding and hydromorphology), water quality, drainage, groundwater, water supplies and Groundwater Dependent Terrestrial Ecosystems (GWDTEs).

The study area for the assessment of likely significant effects on the water environment is generally consistent with the Site boundary. The wider catchment areas have also been considered where appropriate, for example the likely significant effect of the Proposed Development on downstream flood risk has been assessed.

This application is based on a conceptual Masterplan and there is no detailed housing layout available for the site. Accordingly, this assessment aims to identify constraints from existing and proposed activities that could impact negatively on existing soils or the underlying geology, especially with regards to historical contaminants release and to ensure that these are taken into account when determining the proposed land uses.

11.2 Legislation and Policy

11.2.1 Legislative Context

Water Framework Directive, 2000

The Water Framework Directive 2000/60/EC (WFD) applies to all European Union (EU) water bodies and aims to make sure they are protected from further deterioration, and that improvements in water quality are made. The assessment and protection of water bodies should be undertaken irrespective of political or administrative boundaries by implementing River Basin Management Plans to be prepared within a formal series of six-year cycles, following the identification of River Basin Districts. In general terms, there is an onus on developers to protect and, if possible, enhance water bodies close to proposed developments.

Flood Directive, 2007

The Flood Directive 2007/60/EC came into force in November 2007. This Directive requires Member States to assess whether water courses and coastlines are at risk from flooding, to map the flood extent, assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk. The Directive requires Member States to carry out a preliminary assessment of flood risk by 2011, to draw up flood risk maps by 2013 and to establish flood risk management plans focused on prevention, protection and preparedness by 2015. The Directive is to be implemented in co-ordination with the WFD.

Flood Risk Management (Scotland) Act 2009

The Flood Risk Management (Scotland) Act 2009 came into force on 26 November 2009. The Act repealed the Flood Prevention (Scotland) Act 1961 and introduced a more sustainable and streamlined approach to flood risk management, suited to present and future needs and to the impact of climate change. The Act encourages a more coordinated process to manage flood risk at a national and local level.

11.2.2 Policy Context

National Planning Framework 3

The National Planning Framework 3 (NPF3), June 2014 sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland as a whole. It sets out the Government's development priorities over the next 20-30 years and identifies national developments which support the development strategy. NPF3 sets out the vision as follows:

- A successful, sustainable place;
- A low carbon place;
- A natural resilient place; and
- A connected place.
- Scottish Planning Policy

Scottish Planning Policy

Scottish Planning Policy (SPP) was issued in June 2014 and is Scottish Government policy on how nationally important land use planning matters should be addressed across the country. SPP promotes consistency in the application of policy across Scotland whilst allowing sufficient flexibility to reflect local circumstances.

Several key documents related to the water environment were referred and many are referenced individually within this chapter.

11.3 Methodology

11.3.1 Methodology of Assessment

Assessment of the water environment which comprises the qualitative and/or quantitative analysis of the impact of the Proposed Development with respect to the key aspects of the water environment was undertaken using the following methodology:

- Desk-based review of available information, including previous studies (if available in the public domain), geological maps, identification of local water receptors, surface water drainage, hydrogeological data, wetlands including GWDTEs and previous land use, where applicable;
- Consultation with Scottish Environment Protection Agency (SEPA), City of Edinburgh Council (CEC) and Scottish Water to obtain information that they hold in relation to the water environment in the area, including records of flooding, drainage plans, water supplies, and determine any Site constraints;
- Undertake a walkover survey of the Site;
- Analysis of Site hydrology, including surface water catchment mapping, hydrological regime and water body status;
- FRA of the Site (Appendix F1); and
- Identification of relevant issues and potential impacts from the Proposed Development with regards to the water environment.

11.3.2 Assessment Criteria

Sensitive receptors were identified from the baseline information. The receptor sensitivity is defined based on the capacity of the receptor to accommodate change without fundamentally altering its character. The definitions provided in Table 11.1 take into account the quality of the receptor, its purpose and the potential for substitution or replacement.

Mitigation relevant to the water environment which has been incorporated into the design is described in the mitigation section. The impact assessment has been undertaken for the Proposed

Development, as set out in the Indicative Masterplan which will be submitted with the representations to the Main Issues Report.

The criteria set out in Table 11.1 and Table 11.2 have been used to develop a simplified matrix to assess the significance of effects of the Proposed Development on the water environment, as shown in Table 11.3. This methodology is derived from the Scottish Natural Heritage (SNH) Environmental Assessment Handbook (SNH, 2013). The assessment of residual effects also takes into consideration the probability of the effect occurring (certain, likely, possible or unlikely) and the duration of the effect (short (less than 2 years), medium (2 – 5 years) or long term) (more than 5 years).

All direct and indirect impacts causing effects of moderate and major significance as identified in Table 11.3 are considered to be significant in terms of the EIA Regulations. Cumulative effects have also been assessed.

Mitigation required to minimise likely significant effects has been identified. This includes measures required for compliance with relevant legislation and planning policy, and best practice approaches.

Sensitivity	Hydrogeology
High	Receptors with a low capacity to accommodate change, high value or condition and significant use, for example: • Receptor is an internationally or nationally designated Site; • Surface water body supports sensitive aquatic ecological receptors e.g. freshwater pearl mussels; • Flood plain or defence protecting numerous residential properties or industrial premises from flooding upstream/downstream; • Surface water body used for public water supply or large scale industrial/agricultural abstractions; • Surface water body important for recreation directly related to water quality e.g. swimming, watersports, angling; • Groundwater body supports public water supply or large scale industrial/agricultural abstractions; and • GWDTEs which form a qualifying feature, or part thereof, for an internationally or nationally designated Site. Carbon-rich soils which form part of intact, active blanket bog in good condition.
Medium	Receptors with a moderate capacity to accommodate change, medium value or condition and limited use, for example: • Receptor is not an internationally or nationally designated Site. May be a locally designated Site; • Salmonid species may be present and surface water body may be locally important for spawning. No other sensitive aquatic ecological receptors e.g. freshwater pearl mussels; • Flood plain with limited constraints and a low probability of flooding of residential and industrial properties upstream/downstream; • Surface water body used for private water supply or medium scale industrial/agricultural abstractions; • Surface water body used for occasional or local recreation e.g. local angling clubs; • Groundwater body supports identified private water supplies or medium scale industrial/agricultural abstractions; and • GWDTEs with moderate to high dependency on groundwater (as defined by the Site-specific conceptual model).
Low	Receptors with a high capacity to accommodate change, low value or poor condition and no significant uses, for example: • Receptor is not an internationally, nationally or locally designated Site; • Not classified as a surface water body for the River Basin Management Plan; • No sensitive flood risk receptors upstream/downstream; • Surface water body not significant in terms of fish spawning and no other sensitive aquatic ecological receptors e.g. freshwater pearl mussels; • Surface water body not used for abstraction; • Surface water body not used for recreation directly related to water quality e.g. angling, swimming, water sports; • Aquifer with no identified abstractions and • GWDTEs with low to moderate dependency on groundwater (as defined by the Site-specific conceptual model).

Table 11.1: Criteria to assess sensitivity for hydrogeology and geology

Magnitude	Hydrogeology
Major	Total loss or major alteration to key elements/features of the baseline (pre-development) conditions such that post-development character/composition/attributes will be fundamentally changed.
Moderate	Loss or alteration to one or more key elements/features of the Baseline (pre-development) conditions such that post-development character/composition/attributes of baseline will be partially changed.
Minor	Minor shift away from baseline (pre-development) conditions. Change arising from the loss/alteration will be discernible but underlying character/composition/attributes of the baseline condition will be similar to pre development circumstances/patterns.
Negligible	Very light changes from baseline (pre-development) conditions. Change barely distinguishable, approximating to the "no change" situation

Table 11.2: Criteria to assess magnitude for hydrogeology and geology

The significance of an environmental effect is determined by the interaction of magnitude of impact and sensitivity, whereby the impacts can be beneficial or adverse. The Effect Significance Matrix is set out in Table 11.3 below.

Magnitude	Sensitivity		
	High	Moderate	Low
High	Major	Major	Moderate
Moderate	Major	Moderate	Minor
Minor	Moderate	Minor	Minor
Negligible	Negligible	Negligible	Negligible

Table 11.3: Effect Significance Matrix

The effect of Moderate Adverse/Beneficial significance or greater is considered to be significant in EIA terms.

11.4 Baseline

11.4.1 Study Area

The study area for the Flood Risk Assessment (FRA) and the development of the Sustainable Drainage Systems (SuDS) has modelled relevant rivers and watercourses of the catchment and considered runoff into and on the Site and immediate environs, as well as upstream and downstream structures which might impact flood risk.

11.4.2 Site Topography and Land Use

There is an existing watercourse to the north of the site, which, is running in a west to east direction and appears to be an unnamed tributary of the Union Canal.

The area to the south east corner, around this watercourse forms the lowest part of the site, where levels are around 86m AOD. The highest levels are around the middle of the site, along the western boundary and are around 101m AOD.

The land is agricultural and has been for a significant period of time.

11.4.3 Designated Sites

There are no known Ramsar sites, Special Areas of Conservation, Special Protection Areas or Sites of Special Scientific Interest (SSSIs) within the Site or within 5km of the Site.

The Gogar Burn is a locally protected watercourse and as such considered sensitive. However, this watercourse does not adjoin the site. Indeed, there several barriers between the site and this water

course. These barriers include a main road (A71) as well as a significant distance. The site also sits circa 15m higher than the Gogar Burn.

11.4.4 Surface Water Hydrology

There are two watercourses in the vicinity of the site.

On the northern periphery of the site there is a small unnamed watercourse which from west to east, passing under Dalmahoy Road via a concrete box culvert. This watercourse flows along a well-defined valley along the northern boundary of the site. At the north eastern corner of the site, the watercourse enters a length of culvert which takes it under a field in neighbouring land, before re-emerging in an open channel some 230m downstream.

To the south, separated from the site by a significant distance (and the A71 trunk road), and within a deep and wide valley, lies the Gogar Burn.

11.4.5 Flood Risk

The SEPA Flood Map for the site is presented in Figure 11.1. This shows the site is not within any area at risk form fluvial flooding. However, the unnamed burn on the northern periphery of the site does present a flood risk. This is not shown on the SEPA map as the burn catchment is too small at just over 1km^2.

The site is not in the zone for tidal flooding.

The SEPA map shows that the site is at risk from pluvial and overland surface water flows particularly in the south west boundary of the site.

In line with SPP (paragraphs 254-268) and the recommendations of SEPA and FC, a comprehensive Site-specific FRA (Appendix 11.1) was undertaken to assess the risks associated with all potential flood sources and includes a description of the key findings in relation to flood risk under existing Site conditions.

The SEPA Online Flood Risk Management map indicates that the Site is not within an area at risk of groundwater flooding and there are no records of groundwater flooding at the Site. No areas of waterlogged ground, which may indicate groundwater rising and issuing at the surface, were identified during the Site walkover survey.

The intrusive site investigation has yet to be undertaken, however, it is expected that it will not indicate near surface water table and, as such, the ground water flooding risk is expected to be low.

11.4.6 Water Supplies

Information provided by SEPA showed that there are no CAR licensed abstractions located within a 2km radius of the Site.

11.5 Flood Risk Assessment

The Gogar Burn is not considered within the FRA due ot its location relative to the site.

The only watercourse assessed for Flood Risk is the unnamed northern burn.

The watercourse passes under a wall-type structure via a pipe culvert upstream of the Dalmahoy Road crossing. At the latter location the watercourse passes through a short length of box culvert. Both structures have been fully detailed in the survey of the site, as have the open sections of watercourse. Hence, there are no particular issues involved in modelling these features.

At the downstream end of the modelled stretch, there is a 525mm diameter concrete pipe culvert which carries the watercourse for some 230m under a field before re-emerging. The condition and exact configuration of this culvert is not known apart from at the entrance and exit points. Hence, assumptions are required in order to model it – we have assumed the culvert is of uniform diameter along its long but with the bottom 0.1m of the cross section silted up. It is possible this culvert could be surveyed by CCTV camera but this is not critical as the effect of a near-complete blockage has been modelled as part of the sensitivity analysis discussed in Section 5.3 of this report, and this demonstrates that the effect of blockage on flood depths/extents in not significant. This is a function

of the topography in the vicinity of the culvert and the fact that the culvert would be overtopped even when relatively clear.

There are no new structures proposed to be built over the watercourse, and there are no particular issues regarding emergency access and egress from the site during times of flood. The area which will act as a flood catchment area is shown in Figure 11.2.

11.5 Impact Assessment

11.5.1 Evaluation of Receptor Sensitivity

Water environment receptors have been identified and their sensitivity defined on the basis of the baseline information and using the criteria outlined in Table 11.1. these are presented in Table 11.4 below.

11.5.2 Likely Significant Effects

This section discusses the potential impacts on the water environment that could arise in the absence of mitigation during the construction and post-completion phases of the Proposed Development.

Receptor / Location	Sensitivity	Nature of Impact	Magnitude of Impact	Significance of Effects
Gogar Burn	Moderate	Pollution of water from plant and machinery	Moderate	Major adverse
Gogar Burn	Moderate	Pollution of water through concrete spillage.	Moderate	Major adverse
Unnamed burn on northern periphery of site	Moderate	Pollution of water from plant and machinery	Moderate	Major adverse
Unnamed burn on northern periphery of site	Moderate	Pollution of water through concrete spillage.	Moderate	Major adverse
Surface water	Moderate	Pollution of water from plant and machinery	Minor	Moderate adverse
Surface water	Moderate	Pollution of water through concrete spillage.	Minor	Moderate adverse

Table 11.4: Summary table of preliminary construction impacts (without mitigation)

11.6 Design Mitigation

The initial assessment of potential effects informed the design layout, which was subsequently updated to mitigate these effects as far as possible. Mitigation relevant to the water environment which has been incorporated into the design includes:

- Most of the Proposed Development will be setback with sufficient buffer from the 0.5% AEP FFP extent. Any structures to be constructed within the FFP part designated for leisure and tourism in the masterplan will be of non-residential type and their combined footprint will be smaller in comparison with the footprint of the existing buildings that currently sit within the FFP;
- The surface water drainage scheme for the Proposed Development has been designed in accordance with SuDS principles and will attenuate runoff from the Site with the SuDS being an integral part of the built development;
- SuDS incorporated into the Proposed Development will also address pollution of the surface water from sediment, as they will be designed to improve water quality; and
- The SuDS system is designed to enable adoption for future maintenance by Scottish Water or other suitable organisation, in perpetuity.

11.6.1 Construction Phase

The construction phase is the most important in terms of potential impacts on the water environment, with key activities including:

- Earthworks, including alteration of Site ground levels;
- Excavation for foundations of properties and Site infrastructure;
- Stockpiling of excavated materials;
- Creation of impermeable surfaces;
- Construction of a new stormwater drainage system; and
- Use and storage of oils and fuels.

All the above have the potential to cause significant adverse environmental effects.

Upon completion of the Proposed Development, the most important potential impact is the potential change in surface water quality and changes in volume of runoff generated. Increased impermeable surfaces will result in increased volume of runoff and decreased impermeable surfaces will result in reduced volume of runoff, which have an adverse and a beneficial effect, respectively, with respect to associated downstream flood risk.

Surface Water Flow Alterations and Flood Risk

During construction the existing drainage patterns and flow pathways will be altered by the introduction of impermeable surfaces, change in Site ground levels and presence of stockpiles or foundation voids. Impermeable surfaces arising from the compaction of soils and construction of infrastructure will likely reduce infiltration and may lead to an increase in surface water runoff. The potential environmental impacts of this include increases in localised erosion, sediment transport to the Gogar Burn and the unnamed northern burn and both on site and downstream flood risk.

Potential surface water flow alterations are assessed as having a likely, short-term, minor to negligible magnitude impact on the identified surface watercourse (moderate sensitivity receptor), giving rise to environmental effects of **minor adverse** to **negligible** significance in the absence of mitigation measures.

Pollution from Sediments

There is the potential for increased release of fine sediment into the watercourse arising from sediment-laden runoff from areas of soil stripping, earthworks and stockpiles.

Increased sediment loading to the watercourse can degrade water quality and change substrate characteristics, which may affect the quality of the aquatic habitat. Sedimentation of watercourse can also have a detrimental effect on flow conveyance of the channel and downstream culverts, affecting flood risk.

Potential increased pollution from sediments will be short to medium term in duration and are assessed as having a likely, moderate magnitude impact on the identified surface watercourse (moderate sensitivity receptor), giving rise to environmental effects of **moderate adverse** significance in the absence of mitigation measures.

Pollution from chemicals

During construction there is a risk of accidental pollution incidences affecting the water environment (Gogar Burn and groundwater) from the following sources:

- Spillage or leakage of oils and fuels:
  - Stored on site;
  - From construction machinery or Site vehicles; and
  - From refuelling machinery on site.
- Spillage or leakage from on-site toilet facilities;
- Cement, concrete or grout getting polluting surface water or groundwater; and
- Spillage or leakage from use or storage of other chemicals and hazardous substances.

Oil spillages to the water environment would be detrimental to water quality and could affect fauna and flora. Oils and fuels are hazardous (List 1) substances under the Groundwater and Priority Substances (Scotland) Regulations 2009 and their ingress to groundwater must be prevented.

Groundwater vulnerability to pollutants will increase in areas where drift deposits are excavated, for example for foundations or alteration of Site ground levels. Potential contaminants could leak through fractures and cavities in the bedrock and affect groundwater quality.

Cement, concrete and grouts used for construction are highly alkaline and corrosive and can cause serious pollution to the ground and watercourses. Water wildlife, such as invertebrates and fish, are very sensitive to changes in pH (acid/alkaline) levels.

Other chemicals and hazardous substances used and stored on site (e.g. cleaning products, solvents, pesticides) could cause pollution if they enter surface waters or groundwater.

The potential impact of contaminant discharges on the identified receptors is likely to be short-term in nature. Potential contaminant discharges are assessed as having a possible, moderate magnitude impact on surface watercourse (moderate sensitivity receptor) and groundwater (low sensitivity receptor), giving rise to environmental effects of **moderate adverse** and **minor adverse** significance respectively in the absence of mitigation measures.

Groundwater Flow and Level Alterations

Excavations below groundwater level, for example for foundation construction, could lead to localised groundwater drawdown. Groundwater pathways could be altered by construction of foundations and road infrastructure.

The potential impact would be localised in extent and short-term in nature (duration of open excavation or dewatering). Groundwater flow and level alterations are assessed as having a possible, minor magnitude impact on the underlying groundwater (low sensitivity receptor), giving rise to environmental effects of **minor adverse** significance in the absence of mitigation measures.

11.6.2 Operational Phase

Surface Water Flow Alterations and Flood Risk

The FRA presented in Appendix F1 concludes that the Proposed Development does not increase the risk of flooding elsewhere, from fluvial sources for the 0.5% AEP flood event. This is because all units of the Proposed Development will be set back sufficiently from the identified FFP.

Surface water flood risk to the Proposed Development will be managed through the drainage scheme, which has been designed according to SuDS principles. The drainage scheme has been designed to attenuate a 1 in 30-year runoff from impermeable areas within the Proposed Development Site to a 1 in 2 year greenfield (i.e. pre-development) rate. This is in accordance with FC's SuDS – Design Guidance Note.

Pollution from Sediment

The proposed SuDS scheme will cause some of the sediment to settle by slowing down surface runoff through the SuDS scheme thereby reducing the sediment content in runoff from the Proposed Development. Given that there is currently no sediment attenuation on site, the Proposed Development is assessed as having a possible, long-term, beneficial, negligible magnitude impact on the Gogar Burn and unnamed northern burn (moderate and low sensitivity receptors), giving rise to environmental effects of **negligible** significance in the absence of mitigation measures.

Pollution from Chemicals

Post-completion, oils and fuels within surface runoff from roads will be the main source of contaminant discharges. The SuDS scheme for the Proposed Development includes treatment of runoff in accordance with published standards and guidance. Increased contaminant discharges are therefore assessed as having an unlikely, shortterm, minor to negligible magnitude impact on the Gogar Burn, unnamed northern burn and groundwater (moderate, low and low sensitivity receptors respectively), giving rise to environmental effects of **minor adverse** to **negligible** significance in the absence of mitigation measures.

Groundwater Flow and Level Alterations

The impact is normally of short-term duration. Once completed, the ongoing impact of the Proposed Development on groundwater will be negligible over a long-term as the groundwater flow will re-stabilise within the new flow paths. The Proposed Development is therefore assessed as having a

potential long-term, negligible magnitude impact on groundwater (low sensitivity), giving rise to environmental effects of **negligible** significance in the absence of mitigation measures.

11.6 Mitigation

The following section outlines management measures and mitigation that form the principles upon which the Construction Environmental Management Plan (CEMP) will be based. It has been structured based on the key activities associated with the Proposed Development, as many of the mitigation measures will address potential impacts on both surface water and groundwater receptors.

No significant potential effects were identified for the operational phase in the impact assessment and therefore mitigation measures are only required for the construction phase, with only good practice recommendations included for operation.

11.6.1 Construction Phase Mitigation

General Mitigation Measures

Revised levels of authorisation, including amendments to the General Binding Rules (GBR), came into effect on 1 January 2018. These include the need for CAR authorisation for drainage of construction sites over four hectares in size, as well as a change to the size of development that will require authorisation for the permanent surface water drainage. The below mitigation measures take into account these updates to the regulations as the works will be undertaken once they have come into force.

A Pollution Prevention Plan (PoPP) will produced for the Site in line with new CAR requirements, outlining the construction SuDS and agreed with SEPA prior to commencement of works.

A CEMP will be in place during the construction phase, incorporating the PoPP and will remain a live document throughout the construction phase and be continually updated as work progresses. All mitigation measures will be incorporated into the CEMP. The CEMP will be submitted to FC for approval prior to commencement of the construction works, in consultation with SEPA and other agencies such as SNH.

An Environmental Clerk of Works (EnvCoW) will supervise the construction works to ensure that the CEMP, PoPP and associated mitigation measures are implemented effectively. Best practice will be adopted throughout the construction phase following current guidance.

A pollution response plan will be set out in the PoPP and CEMP. This will provide site spill response procedures, emergency contact details and equipment inventories and their location. All staff will be made aware of this document and its content during site induction. A copy will be available in the site office at all times.

Other activities with potential to impact on the water environment, such as abstractions, watercourse crossings and other engineering works may require to be authorised under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR). The level of authorisation required is dependent on the anticipated environmental risk posed by the activity to be carried out. Liaison with the SEPA operations team will be undertaken at an early stage to further confirm this. These activities could include construction drainage, dewatering and storage of oil.

Surface Water Management

Surface water drainage arrangements for the construction phase will be in line with SuDS principles, incorporating appropriate treatment and attenuation prior to discharge to the water environment in accordance with the required CAR authorisation and relevant GBRs. It is proposed to replicate natural drainage around construction areas and to use source control to deal with rainwater in proximity to where it hits the ground.

The implementation of a given construction SuDS measure will be dependent upon detailed Site and hydrological investigations. Detailed surface water drainage proposals and methodology for the construction phase will be detailed within the PoPP.

The construction SuDS features will be installed prior to the main construction activities (including removal of vegetation and any earthworks). Suitable measures will be in place at all times for treatment of runoff from construction areas, to prevent the release of pollutants including sediment to the River Leven.

Any clean runoff from vegetated areas or off site will be kept clean and diverted around works to prevent mixing with silt-laden water.

Surface water management measures employed during the construction phase should be regularly inspected and maintained to check that they are working effectively and that there are no blockages or unexpected discharges. Visual inspection of the discharges to the River Leven should be undertaken regularly and after rainfall events to check that levels of suspended solids have not been significantly increased by on site activities

The risk of oil contamination will be minimised by good site working practice (further described below) and the use of an oil separator will be considered.

Earthworks

Areas stripped of earth and vegetation will be kept to a minimum at any one time in accordance with the revised GBR 11 (which came into effect from January 2018). Soil loss and erosion will be minimised through careful storage, reinstatement and re-vegetation. Stockpiles will be placed in areas of minimal risk of slippage or erosion from drainage and will not be located within 20m of any watercourses or ditches.

Any runoff from active areas including earthworks and stockpiles will be passed through appropriate construction SuDS measures prior to discharge to the water environment.

The time which excavations are kept open will be kept to a minimum to avoid ingress of water, minimise erosion and the need for dewatering. Drainage or pumping from excavations will be minimised through appropriate design. Temporary cut-off drains will be installed if required to prevent surface water runoff entering excavations.

Any dewatering will comply with GBR2 and GBR5 and any water pumped out of excavations will be treated by passing through the construction SuDS prior to discharge to the water environment.

Construction tracks

Access tracks used during construction (i.e. not the final road layout) will incorporate appropriate drainage measures including ditches, camber to shed water to the edges, frequent cross drains and trackside grips/offlets to prevent the tracks acting as a preferential drainage route and to protect the water environment. Any trackside discharge will be passed through appropriate construction SuDS measures prior to discharge to the water environment. Water will not be allowed or encouraged to pond along the track.

Oils, Fuels, Site Vehicles and Welfare facilities

The mitigation measures to minimise risk of contaminant release are in line with the updated Controlled Activities (Scotland) Regulations which came into force on 1st January 2018. The new GBRs consolidate the provisions of the Water Environment (Oil Storage)(Scotland) Regulations 2006 into CAR, and extend the application of those provisions. This includes the following:

- Storage of oil and fuels on site will be designed to be compliant with GBRs 26-28 and any bunds will provide storage of at least 110% of the largest tank's maximum capacity;
- The storage of oil in a portable container with a capacity of greater than 200 litres on site will not be permitted;
- Multiple spill kits will be kept on site;
- Drip trays will be used while refuelling; and
- Regular inspection and maintenance of vehicles, tanks and bunds will be undertaken.

Welfare facilities will include closed-system toilets, with disposal of foul drainage at a suitable off site facility.

Concrete and cement mixing should be sited on an impermeable designated area and at least 10 metres away from a watercourse or surface water drain, to reduce the risk of run-off entering a watercourse. Equipment will be washed out in a designated area, specifically designed to contain wet concrete and wash water. Wash waters should be discharged to the foul sewer with prior permission from Scottish Water or disposed off site at an authorised facility.

All chemicals and hazardous substances will be stored safely, away from watercourses and drains in line with current best practice. They should be disposed of in line with duty of care requirements.

11.6.2 Operational Phase Mitigation

There should be a regular maintenance of SuDS to include the regular debris clearing and cutting of grass of surface SuDS features, and the inspection and repairs to underground features if necessary.

During the operational phase there should be no requirement for groundworks. However, should groundworks be required mitigation highlighted in the construction phase above, will be adopted as appropriate.

11.7 Residual Effects

11.7.1 Construction Phase

Surface Water Flow Alterations and Flood Risk

With mitigation measures, the magnitude impact on the Gogar Burn will reduce from minor/negligible to **negligible** giving rise to residual environmental effects of negligible significance.

Pollution from sediments

With mitigation measures, the magnitude impact on the Gogar Burn will reduce from moderate to minor/negligible, giving rise to residual environmental effects of **minor adverse** significance.

Pollution from chemicals

With mitigation measures, the magnitude impact on the Gogar Burn will reduce from moderate to minor, giving rise to residual environmental effects of **minor adverse** significance.

Groundwater Flow and Level Alterations

With mitigation measures of using relatively shallow wide-base foundations and keeping dewatering to a minimum necessary, the magnitude impact on groundwater (low sensitivity receptor) will reduce from minor to negligible, giving rise to residual environmental effects of **negligible** significance.

11.7.2 Operational Phase

Potential impacts on the unnamed northern burn and groundwater are of negligible significance (both adverse and beneficial) prior to and after mitigation.

11.8 Cumulative Effects

Cumulative effects on the water environment could occur where more than one development is proposed within a catchment. There are no other developments proposed within the catchment of any water course which affects the Hatton Village development.

Therefore, cumulative effects on hydrology and flooding are not considered any further.

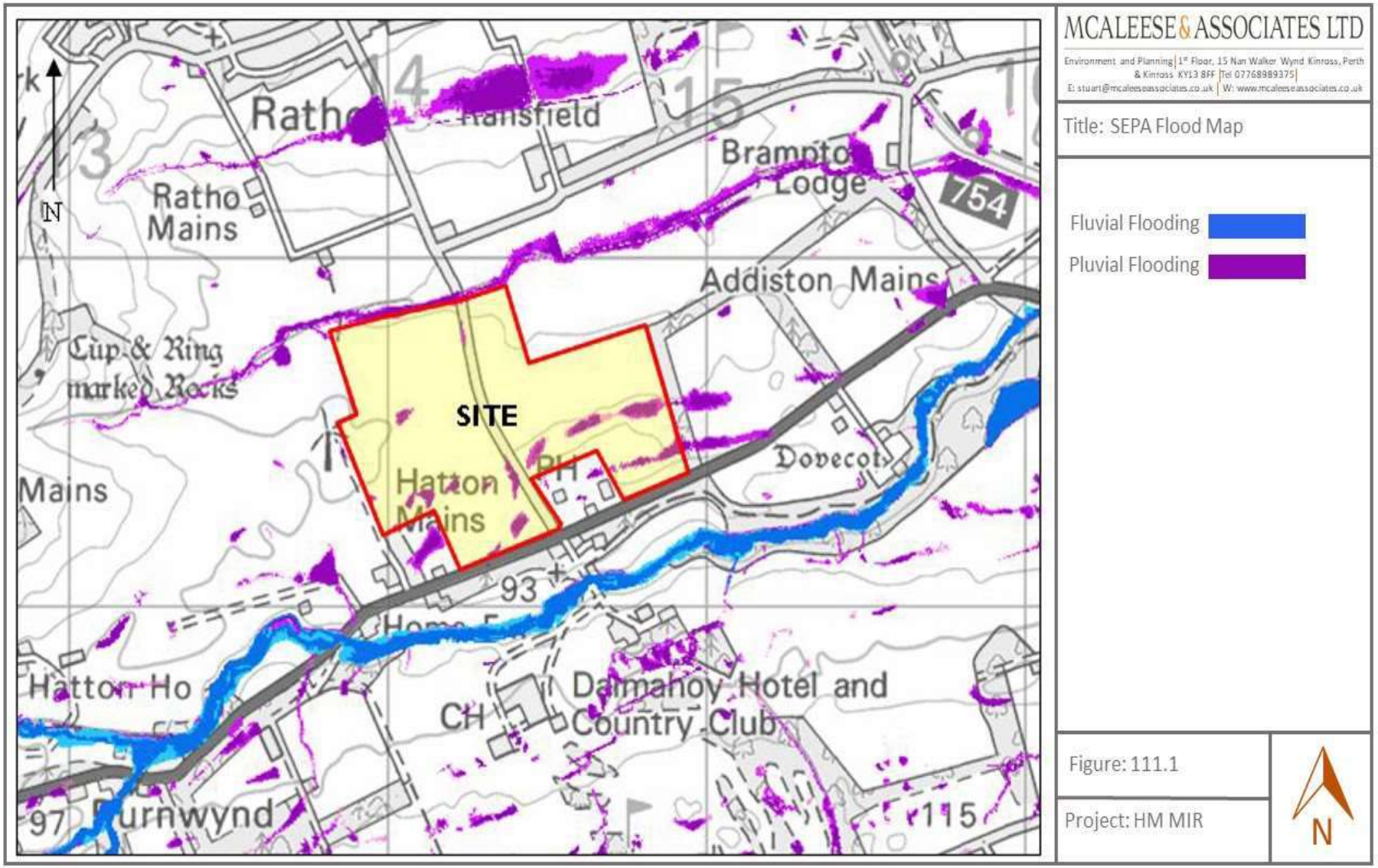
11.9 Statement of Significance

All potential effects on the water environment will be minor adverse or negligible provided that appropriate mitigation, as outlined above is used, and are therefore **not significant** in terms of the EIA Regulations.

11.10 Summary

The assessment was informed by a detailed programme of desk based review of available information; consultation with SEPA, CEC and Scottish Water; a walkover survey of the Site to inspect hydrological features; and analysis of the Site hydrology including surface water catchment

mapping, hydrological regime including groundwater aquifers and water body status. A FRA report was undertaken to provide input to the Masterplanning and design process.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Hatton Ho
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Dalmahoy Hotel and Country Club
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Burnwynd
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Environment and Planning | 1st Floor, 15 Nan Walker Wynd Kinross, Perth & Kinross KY13 8FF | Tel 07768989375
E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
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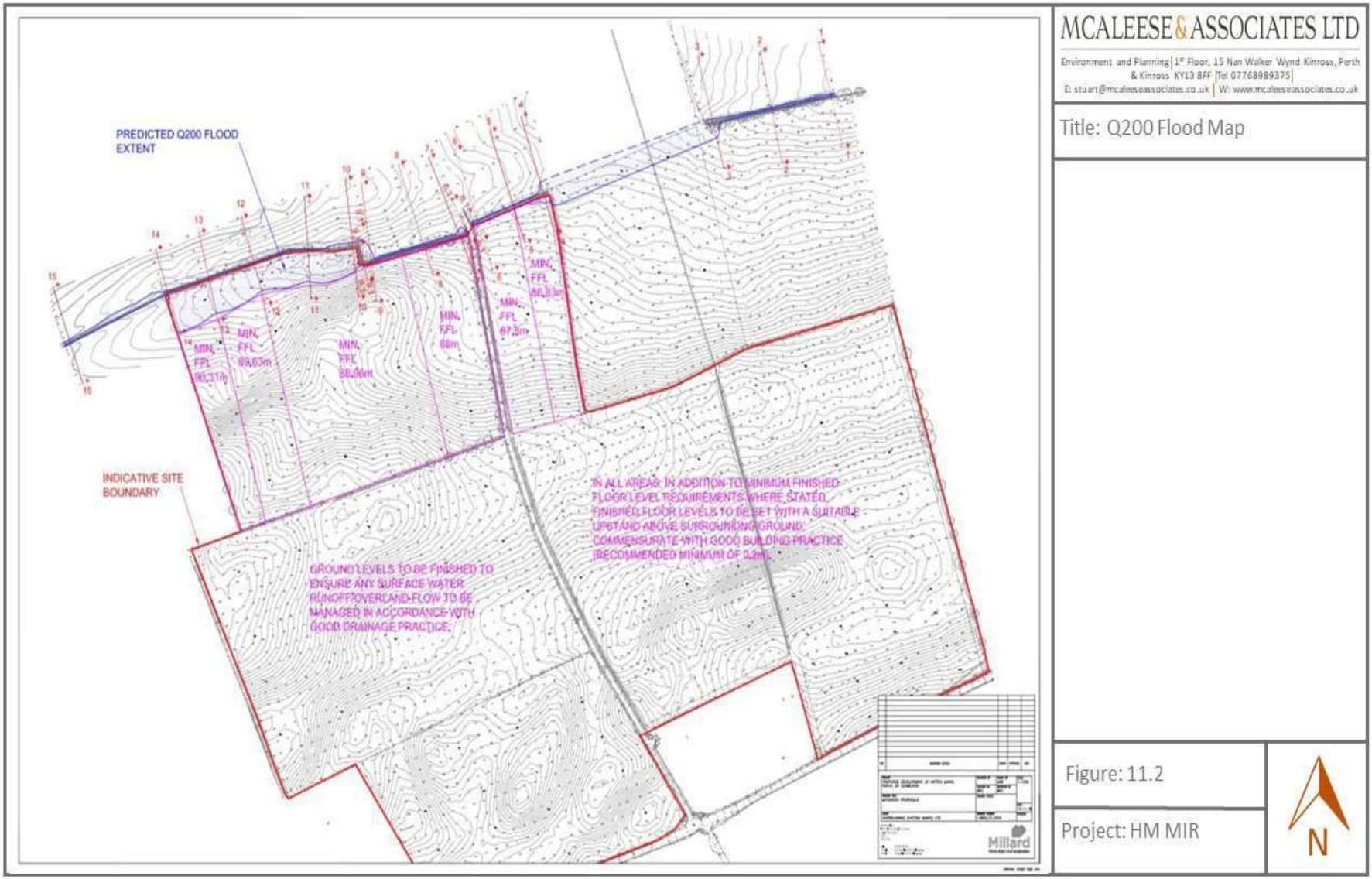
PREDICTED Q200 FLOOD EXTENT
INDICATIVE SITE BOUNDARY
MIN. FFL 90.31m
MIN. FFL 89.63m
MIN. FFL 88.06m
MIN. FFL 88m
MIN. FFL 87.8m
MIN. FFL 86.83m
GROUND LEVELS TO BE FINISHED TO ENSURE ANY SURFACE WATER RUNOFF/OVERLAND FLOW TO BE MANAGED IN ACCORDANCE WITH GOOD DRAINAGE PRACTICE.
IN ALL AREAS, IN ADDITION TO MINIMUM FINISHED FLOOR LEVEL REQUIREMENTS WHERE STATED, FINISHED FLOOR LEVELS TO BE SET WITH A SUITABLE UPSTAND ABOVE SURROUNDING GROUND COMMENSURATE WITH GOOD BUILDING PRACTICE (RECOMMENDED MINIMUM OF 0.2m).
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Chapter 12

Air Quality

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Chapter 12 Air Quality

Table of Contents

12. Air Quality

12.1 Introduction

12.1.1 Introduction

This chapter describes the potential effects of the proposed Hatton Village development on air quality of the local area as a consequence of the additional road traffic the Development will generate. This chapter has been informed by a technical air quality assessment conducted by The Airshed (Appendix G).

This chapter has been produced in full recognition of consultee and public input during the consultation procedures, outlined in Chapter 5 (Environmental Assessment) and should be read with reference to Chapter 3 (The Proposed Development) and, particularly, Chapter 14 which focuses on local transport impacts.

12.1.2 Scope of the Assessment

Current professional non-statutory Guidance indicates that a quantitative air quality impact assessment (AQIA) should be conducted where a scheme is predicted to increase the 24-hour AADT by >500 vehicles per day. On the basis of the IAQM/EPUK Guidance, the impacts on the A71 are above the threshold that would normally trigger the requirement for an AQIA. The study area for the AQIA extends to the roads for which suitable baseline and scheme flows are available. This study area is shown in Figure 12.1.

The aim of this report is to assess the impacts of changes in traffic, on existing and future residents and other sensitive receptors, within the study area. The potential air quality impacts of dust from groundworks and construction operations associated with the development are discussed in section 12.6 along with standard mitigation measures.

12.2 Legislation and Standards

12.2.1 Legislation and Guidance

The Scottish Government has issued Guidance on how air quality issues should be considered within the planning system. This emphasises that local authorities need to understand the links between air quality and land use planning policies, if the planning system is to contribute to the improvement of air quality.

This Guidance should be considered in conjunction with Planning Advice Note (PAN) 51: Planning and Environmental Protection. PAN 51 advises on the policies and practices that should be adopted by planning authorities and others involved in planning new developments and redevelopments.

Part IV of the Environment Act 1995 requires local authorities to review and assess local air quality. The local authority is obliged to take any potential exceedance of Air Quality Objectives into account. Where the Air Quality Objectives are likely to be exceeded, the relevant local authority must declare an Air Quality Management Area.

Under the Guidance to local authorities, published by the Scottish Government, local authorities are required to carry out a staged assessment of local air quality. The most recent Technical Guidance TG16 to local authorities for the review and assessment of air quality was issued in April 2016. This Guidance (TG16) sets out the methods to be used to determine if the Air Quality Objectives are likely to be achieved.

12.2.2 Air Quality Objectives

European Council Directive 96/62/EC on ambient air quality assessment and management (The Air Quality Framework Directive) established a framework for setting limit or target values for air pollutants throughout the European Union. The limits within the Directive were implemented in The Air Quality Limit Values (Scotland) Regulations. European Council Directive 2008/50/EC consolidated earlier air quality directives and introduced new mandatory limit values for Particulate matter $(PM)_{2.5}$.

The UK Government has published an Air Quality Strategy which sets out how the Government proposes to fulfil the UK's obligations under the Air Quality Directive. The Air Quality Strategy for

England, Scotland, Wales and Northern Ireland sets out the policy, targets and objectives for air pollutants. Further details on Scottish Government policy are set out in Policy Guidance. The UK Air Quality Strategy includes more exacting objectives for some pollutants than are required by European legislation. The Scottish Government has adopted a strict annual mean objective of 18 µg/m3 for PM_{10}. This assessment refers only to Scottish Air Quality Objectives for particles, as compliance with these objectives will also meet the less demanding European Air Quality Limit Values.

The World Health Organisation (WHO) has published air quality guidelines for particles. It proposes guidelines and interim guidelines for a range of pollutants including PM_{10} and $PM_{2.5}$, where the recommended annual mean exposure to PM_{10} and $PM_{2.5}$ is less than 20 µg/m^3 and 10 µg/m^3 respectively. These guidelines state that, when assessing impacts from particles, the use of $PM_{2.5}$ is preferred, due to the effects of ultrafine particles on human health.

The Scottish Government has recently revised the Air Quality Objective for $PM_{2.5}$. This sets a $PM_{2.5}$ objective of 10 µg/m^3. The change for PM_{10} (increasing the annual mean objective from 18 µg/m^3 to 20 µg/m^3) has been delayed allowing for the establishment of a $PM_{2.5}$ monitoring network.

The City of Edinburgh Council (CEC) has conducted numerous reviews of air quality, the most recent being published in October 2018. There are no air quality management areas (AQMA) within 6km of the proposed development. The nearest AQMA to the study area is at St John's Road Corstophine, which is ~2km to the north of the A71 at the east end of the study area. There is one air quality monitoring site within the study area.

The revised IAQM/EPUK Guidance on the assessment of air quality impacts proposes an assessment framework for combustion air pollutants (including road traffic). In assessing particulate exposure, the IAQM Guidance recommends that $PM_{2.5}$ should be used to assess the impacts from exposure to particulates rather than PM_{10}. This reflects the advice in the 2005 WHO Guidance discussed above.

12.2.3 Sensitive Receptors

Air Quality Objectives should apply to all locations where members of the public are reasonably likely to be exposed to air pollution for the duration of the relevant objective. Thus, short-term standards, such as the 1-hour objective for NO_2, should apply to locations which may be frequented by the public, even for a short period of time.

Longer-term objectives, such as the 24 hour or annual mean for NO_2 and PM_{10}, should apply only at houses or other sensitive locations which the public can be expected to occupy on a continuous basis. These objectives do not apply to exposure at the workplace.

Air pollution from road traffic can affect human health through inhalation of toxic gases and particles. The main pollutants of concern in the study area are likely to be long-term exposure to NO_2 and airborne particles e.g. PM_{10} and $PM_{2.5}$.

12.2.4 Sensitivity Criteria

Where possible and appropriate, the AQIA assessment has quantified the impacts of the development. Results of the appraisal have been analysed and presented as set against the existing baseline position (as presented in Section 12.5) to identify the scale of the effect, where possible, on the local air quality conditions.

The assessment criteria used in this study are set out in Table 12.1. These are based on EC Limit Values and the current Scottish Objectives.

Pollutant	Assessment Level	Justification
PM_{10}	18 µg /m^3 annual mean	Scottish Air Quality Objective
$PM_{2.5}$	10 µg /m^3 annual mean	Scottish Air Quality Objective
NO_2	40 µg /m^3 annual mean	European Limit Value

Table 0.1: Summary of Assessment Criteria

The criteria used to assess the significance of the impacts set out in Table 12.2 below are for annual mean concentrations only and are based on non-statutory professional Guidance.

Long term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1%	2-5%	6-10%	>10%
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Table 0.2: Definition of Impacts (EPUK IAQM 2017)

N.B. A predicted change of 0% (i.e. <0.5%) is considered to be of negligible significance.

12.2.5 Assessment Methodology Approach

The aim of this assessment is to determine if the road traffic generated by the proposed scheme will significantly affect local air quality within the study area.

The approach used here is to:

- Estimate the emissions from road traffic using traffic survey data and UK vehicle emission estimates; and
- Predict local air pollution levels using a suitable mathematical dispersion model and national estimates of background air pollution

This assessment considers the Scottish annual mean Objectives for $PM_{2.5}$ and PM_{10} and the EC annual mean Limit Value for NO_2. It is assumed that the short-term levels are unlikely to be exceeded where the annual means comply with the relevant air quality criterion.

The assessment considers the air quality impacts within the study area. These predictions are based on the available road traffic survey data and scheme traffic predictions provided by the transport consultants for the project. The extent of the roads considered in the assessment is shown in Figure 12.1.

12.3 Baseline

12.3.1 Air Quality

Estimates of background pollution of particles (PM_{10}) and oxides of nitrogen (NO_x and NO_2) have been obtained from the Scottish Government sponsored air quality archive. The baseline data for $PM_{2.5}$ is based on DEFRA estimates. The data in Table 12.3 below presents the reported estimated background concentrations for 2016 within the study area.

Value	NO_2	NO_x	PM_{10}	$PM_{2.5}$
Average	19.5	12.9	11.8	6.6
Maximum	41.6	24.4	14.3	7.8

N.B. Units = µg /m^3 annual mean

Table 0.1: Annual Mean Estimates of Background Air Pollution

This assessment assumes that background air pollution levels within the study area will not reduce after 2016 and that there will be no reduction in vehicle emissions arising from improvements in

vehicle engine technology due to replacement of ageing vehicles with Euro 6 compliant vehicles. This is intended to be pessimistic, to take account of uncertainties in predictions of background air pollution and vehicle exhaust emissions for future years.

12.3.2 CEC Diffusion Tube Air Quality Measurements

Monitoring for NO_2 was conducted at a single location within the study area between 2011 and 2016 [DT4a at OS 318894, 670493]. The results for this site for the period for which data is available is presented in Table 12.4 below.

Year	2011	2012	2013	2014	2015	2016
NO_2	32	32	30	26	25	28

N.B. units = NO_2 ug/m^3 annual mean

Table 12.4 – Summary of Diffusion Tube Monitoring Data DT4a

The results from this monitoring location indicate that air quality is well below the EC annual mean Limit Value for NO_2. The summary of results published by CEC indicates that levels of NO_2 have been trending slightly downwards within the study area in recent years.

12.3.3 Traffic Flow

Reliable estimates of traffic flows are essential to enable realistic modelling of vehicle exhaust emissions. The traffic flows used in this study are based on data provided by AECOM. A summary of the traffic flow data used for the assessment is presented in Appendix G.

12.4 Model Results

12.4.1 Model Scenarios

Three traffic scenarios have been modelled and assessed:

- Scenario 1: Baseline for 2015 and 2016, for model verification;
- Scenario 2: Baseline 2030, taking account of traffic growth and committed developments; and
- Scenario 3: Scheme 2030, with the proposed scheme in place.

The 2030 Baseline and Scheme Scenarios (Scenarios 2 and 3) ignore any potential reductions in emissions after 2017 due to improvements in the UK vehicle fleet by the elimination of older, more polluting vehicles, and do not take account of Scottish Government and DEFRA predicted reductions in background air pollution for future years. Both Scenarios for 2030 assume Scottish Government background estimates for NO_x, NO_2 and PM_{10} and DEFRA estimates for $PM_{2.5}$ for the year 2016.

Scenarios 2 and 3 assume UK EFT v8.0 (2VC) emission factors for 2016, and Scottish urban emission factors. Road traffic speeds on all links are based on posted speed limits. Diurnal variations in flow have been taken into account based on typical diurnal flows on Scottish A class roads.

12.4.2 Scenario 1 (Verification)

Model verification (where the differences between the measured and predicted levels are considered, to estimate model uncertainties) has been conducted using the NO_2 diffusion tube data from CEC's diffusion tube site DT4a for the years 2015 and 2016.

The baseline road NO_x at the diffusion tube monitoring site has been calculated using the DEFRA v6.1 diffusion tube spreadsheet. This calculates the contribution of local road NO_x from the NO_2 concentrations measured by diffusion tubes. This is in accordance with the method set out in Box 7.15 of TG16. The calculated levels of road NO_x from the diffusion tubes have been compared to the modelled road NO_x contributions predicted using the dispersion model.

The model predictions for the two years for which data is available indicate that the road NO_x predicted by the dispersion model is underestimated by ~46% over the two years under consideration and that the predicted road source contribution of NO_x should be adjusted by a factor of 1.4587 to achieve a better fit with the calculated road NO_x.

The predicted levels of NO_x from the roads in the study area have therefore been adjusted using this factor, in accordance with the method set out in Box 7.15 of TG16. The adjusted predicted road NO_x from the roads in the study area is compared with the calculated road NO_x below. This indicates that the modelled road NO_x levels agree well overall with the calculated levels when adjusted using this factor. These are summarised in Table 12.5 below.

Year	Location	Predicted	Measured
2015	DT4a	25	25
2016	DT4a	28	28

N.B. Units = NO_2 ug/m_3 annual mean

Table 12.5 - Comparison of Measured and Predicted NO_2 (Diffusion Tubes)

TG16 suggests that a dispersion model is performing well where they are within 25% of each other, ideally within 10%. All predicted levels of NO_2 are +10% of the measured levels. The comparison between the measured and predicted levels of NO_2 in the study area indicates that the model results are likely to be robust, particularly for the section of the A71 to the east of the A720.

12.4.3 Scenario 2 (Anticipated Growth) and Scenario 3(With Proposed Development)

The annual mean NO_2 for the 2030 baseline Scenario is predicted to range from 15– 34 ug/m_3 at sensitive receptors within the study area.

The predicted annual mean PM_{10} for the 2030 baseline and scheme Scenarios is presented in Appendix G, Table 5.3 (page 29). The annual mean PM_{10} for the baseline is predicted to range from 15.0 – 17.4 ug/m_3 within the study area, where the highest predicted levels are at Calder View (R35). The annual mean PM_{10} is predicted to increase by 1% at some sensitive receptors. The impact is higher at one receptor location at Wester Row (R27).

The predicted annual mean $PM_{2.5}$ for the 2030 baseline and scheme Scenarios is presented in Appendix G, Table 5.4 (page 30). The annual mean PM_{10} for the baseline is predicted to range from 8.2 – 9.6 ug/m_3 within the study area, where the highest predicted levels are at Calder View (R35).

12.5 Impact Assessment

This assessment predicts air quality impacts using the detailed dispersion modelling methods set out in the current Technical Guidance.

12.5.1 Construction Impacts

Potential adverse effects from the release of dust particles include:

- loss of amenity due to deposition and soiling of surfaces;
- damage to crops and other vegetation; and
- human respiratory ill-health due to inhalation.

Most airborne particles from construction and demolition are above the diameter at which adverse effects on human health are likely to occur.

As with most developments, site clearance, groundworks and construction operation can be potentially dusty procedures. Dust means all particles < 75 µg in diameter.

Potentially dusty operations include:

- changes to the landform;
- the removal and storage of topsoil and subsoils;
- the movement of vehicles on unpaved surfaces;
- road building;
- laying of services and other groundworks;
- the erection of buildings; and
- the storage of building materials and waste products.

Local impacts from dust tend to be felt within only 50m of the boundary of the site (with some impacts on human receptors being felt at up to 350 metres, under exceptional circumstances). The predominant wind direction is westerly. Therefore, any dust is likely to be blown eastwards from the site across agricultural land.

Dust could become more of an issue once the site starts to become occupied with residents experiencing dust impacts from the next phase of construction. However, this effect has been mitigated for by phasing the build out of the project from west to east.

12.5.2 Operational Impacts

Potential Air Quality Impacts, as a result of the operational phase, essentially occur as a result of increased traffic.

12.5.3 Impacted Receptors

The worst case assessed levels at Wester Row (R27), the only receptor considered in the study area with impacts of slight adverse significance, are summarised in Table 12.6 below.

Pollutant	Baseline S2	Scheme S3	Change	Significance
NO_2	17	17	1%	Slight Adverse
PM_{10}	16.9	17.2	1%	Slight Adverse
$PM_{2.5}$	9.4	9.5	1%	Slight Adverse

N.B. Units = ug/m3 annual mean (includes 2016 background and 2016 emission factors)

Table 12.6: Worst case predicted air pollution 2030 (Wester Row R27)

The worst case predicted level at any sensitive receptor considered in the study area is at Calder View (R35). These impacts are summarised in Table 12.7 below.

Pollutant	Baseline S2	Scheme S3	Change	Significance
NO_2	34	34.5	1%	Negligible
PM_{10}	17.4	17.5	0%	Negligible
$PM_{2.5}$	9.6	9.7	0%	Negligible

N.B. Units = ug/m_3 annual mean (includes 2016 background and 2016 emission factors)

Table 12.7: Worst case predicted air pollution 2030 (Calder View R35)

Baseline 2030 levels of NO_2 are predicted to comply with the annual mean Limit Value of 40 ug/m_3 at all sensitive receptors considered within the study area. The predicted increase in the annual mean NO_2 as a consequence of the scheme is of slight adverse significance or less at all sensitive receptors considered within the study area in terms of the IAQM/EPUK assessment framework.

The baseline 2030 annual mean levels of PM_{10} are predicted to comply with the Scottish Air Quality Objective of 18 ug/m^3 at all sensitive receptor locations considered within the study area. The predicted increase in PM_{10} exposure as a consequence of the scheme is of slight adverse significance or less at all sensitive receptors within the study area in terms of the IAQM/EPUK assessment framework.

The predicted increase in $PM_{2.5}$ is of slight adverse significance or less at all sensitive receptors considered within the study area in terms of the IAQM/EPUK assessment framework.

12.6 Mitigation

The methods for controlling dust and other air quality impacts during construction will be managed by the Principal Contractor (PC) on the site. The methods used will be set out in the Construction Environment Management Plan (CEMP) which will be agreed with CEC prior to adoption.

For reference, typical working methods which could be adopted are set out further in Appendix G and summarised below:

- The main contractor shall provide a telephone 'hotline' to enable direct contact between members of the public and the site agent, to enable rapid response to dust complaints;
- The main contractor shall formally advise Environmental Health for the City of Edinburgh Council of the proposed methods of working or any changes proposed. The main contractor shall take account of feedback as appropriate. The outcome of all onsultations and feedback shall be recorded;
- All mobile plant introduced onto the site shall comply with the Stage 1 emission limits for off road vehicles as specified by EC Directive 97/68/EC. All mobile plant shall be maintained to prevent or minimise the release of dark smoke from vehicle exhausts. Details of vehicle maintenance shall be recorded;

- The main contractor shall ensure that risk of dust annoyance from the operations is assessed throughout the working day, taking account of wind speed, direction, and surface moisture levels. The main contractor shall ensure that the level of dust suppression implemented on site is adequate for the prevailing conditions. The assessment shall be recorded as part of documented site management procedures;
- Internal un-surfaced temporary roadways shall be sprayed with water at regular intervals as conditions require. The frequency of road spraying shall be recorded as part of documented site management procedures;
- Surfaced roads and the public road during all ground works shall be kept clean and swept at regular intervals using a road sweeper as conditions require. The frequency of road sweeping shall be recorded as part of documented site management procedures;
- All vehicles operating within the site on unsurfaced roads shall not exceed 15mph to minimise the re-suspension of dust;
- Where dust from the operations are likely to cause significant adverse impacts at sensitive receptors, then the operation(s) shall be suspended until the dust emissions have been abated. The time and duration of suspension of working and the reason shall be recorded;
- Dust management plan shall be reviewed monthly during the construction project and the outcome of the review shall be recorded as part of the documented site management procedures; and
- No fires or burning of wastes shall be permitted on site during construction;

12.7 Significance of Residual Effects

Existing levels of air pollution at sensitive receptors within the study area comply with the European annual mean Limit Value for NO_2.

The predictions in this assessment are very pessimistic as they assume no reduction in background air pollution and no reduction in vehicle exhaust emissions between 2016 and 2030.

The baseline conditions in 2030 are predicted to comply with the EC annual mean Limit Value for NO_2 at all sensitive receptors considered within the study area. The predicted increase in the annual mean NO_2 as a consequence of the scheme is of slight adverse significance at one receptor (Wester Row R27) and of negligible significance at all other sensitive receptors considered within the study area in terms of the IAQM/EPUK assessment framework.

The predicted increases in the annual mean PM_{10} and $PM_{2.5}$ are of negligible significance at all sensitive receptors considered within the study area as a consequence of the proposed scheme in terms of the IAQM/EPUK assessment framework, with the exception of a single receptor (Wester Row R27).

Levels of NO_2, PM_{10} and $PM_{2.5}$ within the proposed development site are predicted to comply with EC Limit Values and Scottish Air Quality Objectives with the scheme in place.

12.8 Summary

The LPA advised in scoping that the application must include an Air Quality Impact Assessment (AQIA). The Airshed conducted the AQIA to assess the impacts from the scheme.

The proposed development will increase road traffic on the A71, mainly on road links to the east, towards the A720 and the city centre where the greatest increase will be on Dalmahoy Road (an additional 3,447 vehicles per day) and on the A71 east of Dalmahoy Road (an additional 2,822 vehicles per day).

Air pollution from road traffic can affect human health through inhalation of toxic gases and particles. The main pollutants of concern in the study area are considered to be long-term exposure to NO_2 and airborne particles e.g. PM_{10} and $PM_{2.5}$.

Three traffic Scenarios were used to assess local air quality impacts:

- Baseline 2015 and 2016, to enable model verification;
- Baseline traffic for 2030, including committed development; and
- Baseline and Scheme traffic 2030.

A computer-based dispersion model (ADMS Roads 4.1) was used to predict road traffic emissions. The two main traffic Scenarios for 2030 (Scenarios 2 and 3) assume 2016 vehicle fleet composition and 2016 background air quality.

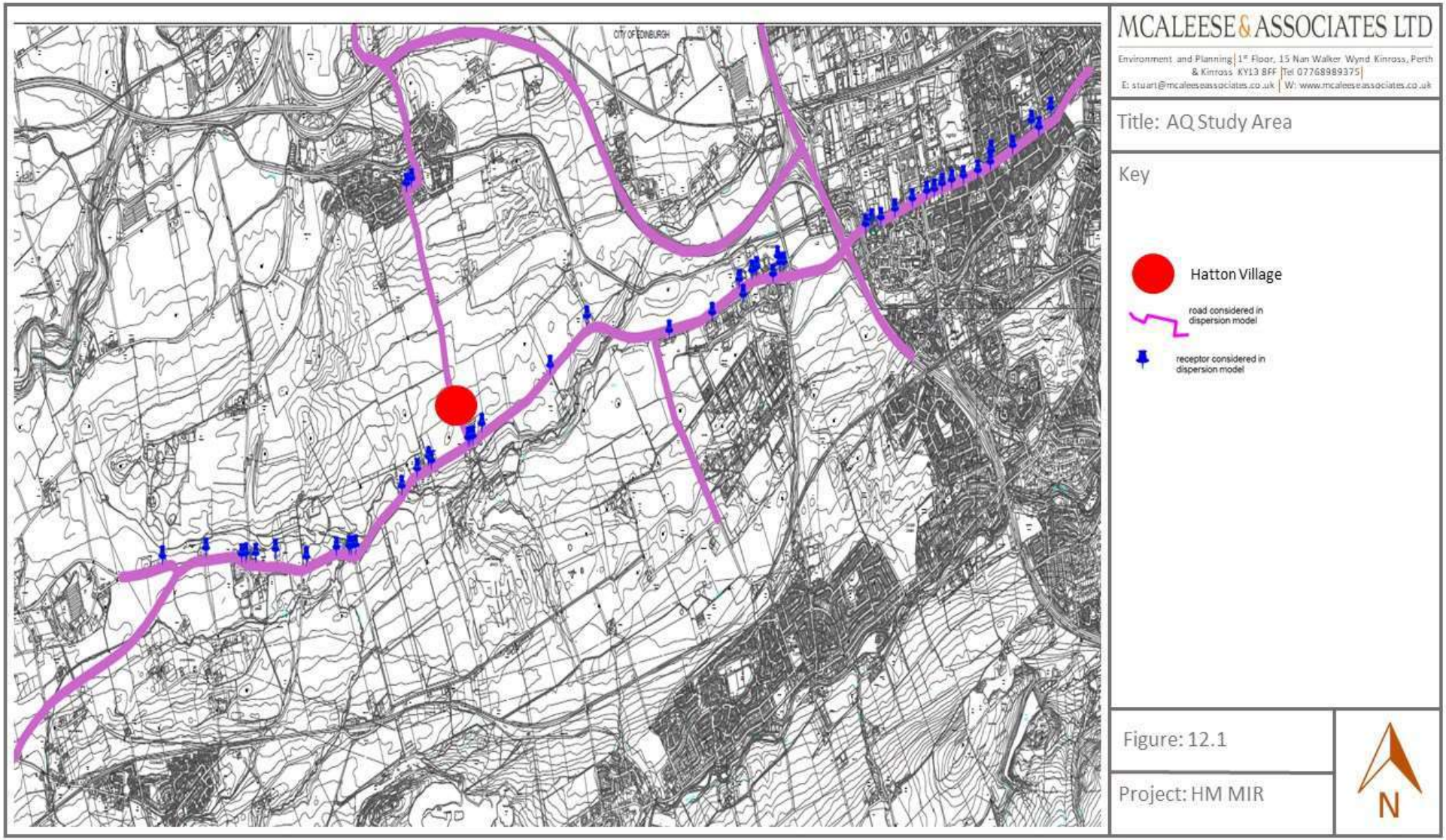
A model sensitivity analysis was conducted to assess the significance of meteorological variability and surface roughness. The worst case one year in five for meteorological data was used to predict air quality impacts.

The results from CEC's diffusion tube monitoring in the study area have been used to compare the measured and predicted levels of NO_2. The results from the dispersion model are significantly lower than the estimated road NO_x and have been adjusted in accordance with the Scottish Government's Technical Guidance TG16. This indicates that the predicted levels are robust.

Impacts have been assessed in accordance with the non-statutory guidance published by the Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK). The predictions in this assessment are very pessimistic as they assume no reduction in background air pollution and no reduction in vehicle exhaust emissions between 2016 and 2030.

Baseline 2030 levels of NO_2 are predicted to comply with the EC annual mean Limit Value of 40 ug/m_3 at all sensitive receptors considered within the study area.

The predicted increase in the annual mean exposure to all pollutants (NO_2, PM_{10} and $PM_{2.5}$) as a consequence of the scheme is of **negligible significance** at all sensitive receptors considered within the study area, with the exception of a single receptor at Wester Row where the impacts are predicted to be of **slight adverse significance**.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Chapter 13

Noise

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Chapter 13 Noise

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13. Noise

13.1 Introduction

13.1.1 Introduction

This chapter describes the potential effects of the proposed Hatton Village development on noise receptors of the local area as a consequence of the additional road traffic the Development will generate. This chapter has been informed by a technical noise impact assessment conducted by The Airshed (Appendix H).

This chapter has been produced in full recognition of consultee and public input during the consultation procedures, outlined in Chapter 5 (Environmental Assessment) and should be read with reference to Chapter 3 (The Proposed Development) and, particularly, Chapter 14 which focuses on local transport impacts.

13.1.2 Scope of the Assessment

A baseline noise survey has been conducted to quantify the existing ambient and background sound levels affecting the proposed development site. This survey was conducted by The Airshed in February/March 2019.

The proposed methods and approach were submitted in advance to the local authority (CEC) as part of the scoping exercise.

The assessment considers impacts from road traffic in accordance with the methods set out in Technical Advice Note (TAN) which forms part of the Scottish Government's Planning and Noise Advice 2011/1.

This report describes the potential noise impacts likely to arise from the proposal, reviews the assessment criteria that have been used to consider the impacts, and reports the results of the baseline survey. Noise levels from road traffic have been predicted across the development area and assessed against appropriate environmental noise criteria intended to protect human health and residential amenity.

This application is based on a conceptual Masterplan and there is no detailed housing layout available for the site. Accordingly, this assessment aims to identify constraints from existing and proposed noisy activities that could affect health or amenity, to ensure that these are taken into account when determining the proposed land uses.

The site layout shows a significant buffer between the Ratho Park Hotel and the agricultural buildings at Easter Hatton Mains. Noise from these adjacent land uses is unlikely to be significant and has not been quantitatively assessed. Construction impacts have not been assessed quantitatively, as the programme for site clearance and construction has not yet been developed.

13.2 Environmental Noise Criteria

13.2.1 Planning Advice Note

The Technical Advice Note (TAN) issued to accompany the PAN for the assessment of noise proposes methods to consider how noise from a proposed new road could affect existing noise sensitive receptors. The change in ambient noise level resulting from the proposed scheme is used to determine the magnitude of the impact, as described in Table 13.1 below.

Change in Noise Level, xLA_{10}, 18 hours	Magnitude of Impact
X ≥ 5	Major adverse
3 ≤ x < 5	Moderate adverse
1 ≤ x < 3	Minor adverse
0 < x < 1	Negligible adverse
X = 0	No change
-1 < x < 0	Negligible beneficial
-3 < x ≤ -1	Minor beneficial
-5 < x ≤ -3	Moderate beneficial
X ≤ -5	Major beneficial

Table 03.1: Assessing significance of change in road traffic on existing receptors

A different approach is adopted when assessing the potential impacts from transport noise on proposed residential uses, where the ambient noise at the proposed dwellings is compared to a target noise level, usually based on World Health Organisation environmental noise criteria. This approach is set out in Table 13.2 below.

(Existing – Target) Noise Level (x) dB $LAeq_{(0700-2300)}$ dB	Magnitude of Impact
X ≥ 10	Major adverse
5 ≤ x < 10	Moderate adverse
3 ≤ x < 5	Minor adverse
0 < x < 3	Negligible adverse
X = 0	No change

Table 03.2: Assessing significance of proposed road traffic on new receptors

13.2.2 BS 5228:2009 Control of Noise from Construction Sites

Noise impacts from construction and open sites may be predicted and assessed using BS 5228:2009. BS 5228 provides base data for noise emissions from a variety of plant and operations and a methodology for the prediction of noise levels at receptors. The annoyance from construction site noise is likely to depend on a number of factors such as site location, existing ambient noise levels, and duration of operations. As with all aspects of noise, the time of day and duration of the event are significant, as is the extent to which noise from the activity exceeds the existing background (LA_{90}) or ambient noise levels (LA_{eq}). The current version of the Standard includes an assessment framework for assessing the significance of impacts, where daytime levels < 65 dB $LA_{eq\ (07::00\ –\ 19:00)}$ are deemed to be insignificant. BS 5228 acknowledges that stricter standards should apply to some forms of construction operations where these are likely to last for more than six months.

13.2.3 World Health Organization (WHO) Guidelines

The World Health Organisation (WHO) has published Guidelines for Community Noise, the outcome of a WHO expert task force meeting in 1999. The WHO Guidelines advise that noise impacts within dwellings include annoyance and speech interference. These criteria are summarised in Table 13.3 below.

Environment	Critical Health Effect	Sound Level dB $LA_{eq\ T}$	Time (Hours)
Outdoor living areas	Annoyance	50 – 55	16
Outside dwellings (long term average)	Sleep disturbance	45	N/A
Inside dwellings	Speech unintelligibility	35	16
Bedrooms	Sleep disturbance	30	8
School playground and outdoors	Annoyance (external sources)	55	During play

Table 03.1: Summary of WHO environmental noise criteria

13.2.4 Noise Assessment Criteria

The following assessment criteria have been adopted to help determine the significance of the environmental noise impacts. These criteria are set out in Table 13.4 below.

Predicted Noise Level	Justification
50 – 55 dB $LA_{eq\ 16\ hour}$	WHO criteria propose a daytime limit at houses and outdoor living areas to protect amenity (for transport noise). This level may also be used to assess impacts on outdoor learning areas in schools.
45 dB L_{night}	WHO criteria propose a night-time sleep disturbance limit at dwellings based on the long-term average outdoor noise level. This is the predicted or measured level at the façade of any exposed elevation, but not taking the effect of that façade into account. This standard is intended to prevent sleep disturbance and to protect human health. The design of the new development should take this standard into account as a precautionary measure.
30 dB $LA_{eq\ 1\ hour}$	Critical noise level to prevent sleep disturbance inside bedrooms, based on WHO criteria.

Table 03.4: Environmental noise assessment criteria

13.3 Baseline

A baseline survey was conducted between 12th February and 30th March 2019. The aim of the baseline survey was to assess existing ambient and background sound levels at the development site boundary adjacent to the A71. The locations of the baseline sites are shown in Figure 13.1.

The survey locations were selected to represent typical conditions within the study area adjacent to the A71.

Noise levels were recorded at 1-minute intervals, to help identify specific noisy events. The parameters LA_{90}, LA_{max} and LA_{eq} are reported. Measurements were taken using Norsonic Type 1 sound level meters. The instrumentation was calibrated at the beginning and end of the survey periods. The instrumentation was contained within sealed weather-proof cases with full outdoor microphone protection. Weather conditions during the survey periods were suitable, typically with light winds and no precipitation. The temperature, wind speed and wind direction were noted at the beginning and end of each survey period. These are recorded in the survey log.

Further details of the baseline survey are contained within Appendix H. Details of the character of the noise at the survey locations are summarised in Table 13.5 below.

Site	Site Conditions
Site 1	The ambient noise is dominated by noise from road traffic on the A71.
Site 2	The ambient noise is dominated by noise from road traffic on the A71.
Site 3	The ambient noise is dominated by noise from road traffic on the A71. Traffic travelling east is on a slight gradient which generates greater noise from HGVs.

Table 03.5: Summary of site survey details

The baseline survey data is presented in Appendix H and summarised in Table 13.6 below.

Site	Date	Time Start	LA_{eq}	LA_{max}	LA_{90}
1	12 Feb 2019	1415	74	92	59
	14 Feb 2019	1012	75	91	59
	25 Feb 2019	1618	73	94	63
	26 Mar 2019	0600	76	96	61
	26 Mar 2019	0700	76	90	65
	27 Mar 2019	2330	63	84	37
2	12 Feb 2019	1310	74	91	62
	14 Feb 2019	0800	77	93	65
	25 Feb 2019	1545	75	94	64
	26 Mar 2019	0125	63	87	36
	27 Mar 2019	2227	70	103	44
3	12 Feb 2019	1200	75	94	60
	14 Feb 2019	0906	74	91	62
	25 Feb 2019	1730	74	88	65
	26 Mar 2019	0015	65	87	42
	27 Mar 2019	2120	70	87	54

Table 13.6: Summary of baseline noise 2019 (Sites 1 – 3)

N.B. Units = dB $LA_{1\ hour}$

Noise from road traffic dominates the acoustic environment close to the A71. The measurement locations are exposed to traffic noise throughout the daytime, and only reduce after 23:00 hours. The daytime ambient noise is 74 – 75 dB $LA_{eq\ daytime}$ at all three sites.

13.4 Methodology

13.4.1 Approach

Noise from road traffic was measured at three locations adjacent to the A71 in suitable weather conditions. These measured levels provide a reasonable representation of existing ambient sound.

The prediction method for road traffic noise is based on the method set out in *Calculation of Road Traffic Noise* (CRTN)8. CRTN $LA_{10\ 18\ hour}$ predictions have been converted to $LA_{eq\ 16\ hour}$ in accordance with the Transport Research Laboratory (TRL) method adopted for noise mapping in the UK where $LA_{eq\ 16\ hour}$ = 0.94 * $LA_{10\ 18\ hour}$ + 0.77 dB. CRTN includes methods for the calculation of road traffic noise levels in most situations, taking into account factors such as distance between the road and receptor, road configuration, ground cover, screening, angle of view, reflection from facades, and traffic flow, speed and composition. The method is suitable for calculating noise levels from free flowing traffic at properties more than 4m from the carriageway, defined as the nearside kerb. The traffic data used to conduct the assessment are based on the findings reported by AECOM. The data used in the CRTN computer model (implemented by SoundPlan 8.1) includes a three-dimensional digital map of surrounding topography.

The terrain data used for transport noise sources is based on OS Terrain 5 spot heights on a 5m resolution grid. The noise model layout is shown in Figure 13.2.

13.4.2 Scenarios Considered

Three following scenarios have been modelled and assessed:

- Scenario 1: Model calibration;
- Scenario 2: Baseline 2030;
- Scenario 3: Scheme 2030, with the proposed scheme in place;
- Scenario 4: Scheme with mitigation option 1 - 2.5m high acoustic barrier;
- Scenario 5: Scheme with mitigation option 2 – Masterplan mitigation of windows etc;
- Scenario 6: Scheme with mitigation option 3 – amended Masterplan layout; and
- Scenario 7: Scheme with mitigation option 4 – amended Masterplan layout with 4m acoustic barrier.

Scenario 3 predicts the noise across the proposed development once the scheme is in place. The traffic flow data used for Scenario 3 is summarised in Table 13.7 below. Further details on the traffic flows used for Scenarios 1 – 3 are presented in Appendix H.

No	Location	Day		Night	
		LDV	HDV	LDV	HDV
5	A71 west of Dalmahoy Road	1041	17	132	2
6	Dalmahoy Road	343	6	59	1
8	A71 east of Dalmahoy Road	1310	21	157	3

Table 13.7 - Road Traffic Flows 2030 – with scheme (Scenario 3)

N.B. Flows = hourly annual average weekday flows

13.5 Assessment Results

This assessment reports the predicted noise from road traffic to identify the constraints on the proposed development site and help inform the layout for the scheme.

13.5.1 Scenario 1 - Noise from Road Traffic – Baseline 2019

The predicted and measured levels of road traffic noise at Baseline Sites 1 – 3 are summarised in Table 13.8 below. This indicates that the noise model predictions are robust.

Location	Predicted Noise (Scenario 1)	Measured Noise 2019
Baseline Site 1	75	75
Baseline Site 2	75	75
Baseline Site 3	74	74

Table 13.8 - Comparison of Measured and Predicted Road Traffic Noise

13.5.2 Predicted Impact on Existing Receptors

The predicted noise from road traffic in 2030 for baseline and scheme are presented in Table 13.9 below. The predicted change in noise from road traffic is of minor adverse significance or less at all sensitive receptors considered within the study area with the exception of the dwellings at Ransfield Cottages on Dalmahoy Road. The impacts at Ransfield Cottages is predicted to be of Moderate Adverse Significance in terms of the assessment framework set out in Table 13.1.

No	Receptor	Floor	Facade	S2 Scheme	S3 Scheme	Change
1	Dalmahoy Gatehouse	GF	SW	66	67	1
2	Dalmahoy Gatehouse	GF	NE	65	65	0
3	Dovecoat Lodge	GF	SE	59	60	1
4	East Gateside	GF	SE	76	76	0
5	Easter Hatton Cottages	GF	S	66	66	0
6	Easter Hatton Cottages	GF	S	69	69	0
7	Easter Hatton Mains	GF	S	65	65	0
8	Entry Head	GF	SW	60	60	0
9	Entry Head	GF	NE	62	62	0
11	Hatton Mains	GF	N	72	72	0
12	Hatton Mains Cottage	GF	NW	69	69	0
14	New Dalmahoy	GF	N	3	64	1
15	Ransfield Cottages	GF	N	57	60	3
18	Ratho Park Hotel	GF	S	62	63	1
19	St Marys Hall	GF	W	60	61	1
21	The Elms	GF	N	64	64	0

Table 13.9 - Comparison of Measured and Predicted Road Traffic Noise

13.5.3 Predicted Impact Across the Proposed Development Site

The results have been calculated over the study area at 5m intervals. The resulting predictions have been contoured using Surfer ® and plotted on an OS map base at 1:10,000. The noise predictions are at 1.5m height above ground level. This is considered to represent noise exposure in gardens and at ground floor windows. The predicted daytime noise from road traffic for Scenario 3 is plotted in Figure 13.4. The results from this prediction exercise indicate that noise from road traffic on the adjacent roads is a significant development constraint.

Scenario 4 considers the benefit of erecting 2.5m high acoustic barriers along the A71. This measure only slightly reduces ambient noise and is unlikely to provide sufficient mitigation unless combined with other measures. The results from this assessment are plotted in Figure 13.5.

Scenario 5 includes the 2.5m roadside acoustic barriers along with an indicative layout. This shows that noise levels are predicted to comply with the WHO outdoor living area criterion in some locations

near the A71, where building orientation provides sheltered elevations. The results from this assessment are plotted in Figure 13.6.

Scenario 6 rotates the buildings to the west of Dalmahoy Road near the A71 to provide more effective shielding of private garden areas. The results are plotted in Figure 13.7. This indicates that noise levels in private gardens can be reduced to below 55 dB $LA_{eq\ 07:00\ -\ 23:00}$ by changing the layout of the development. Based on this indicative layout noise levels can be reduced to comply with WHO's criterion for outdoor living areas.

Scenario 7 considers the erection of a 4m high acoustic barrier (2m bund topped with a 2m fence). In this Scenario the buildings are set further back to accommodate the bund. The results for Scenario 7 are plotted in Figure 13.8. This shows that the predicted external noise levels at the area zones as community education is below 55 dB $LA_{eq\ 07:00\ -\ 23:00}$ and would comply with WHO criteria for outdoor learning.

The predicted noise levels at fixed receptor locations at the exposed and sheltered elevations of houses at ground and first floor levels are summarised in Table 13.10. The worst case predicted levels 65 dB $LA_{eq\ 07:00-\ 23:00}$ and night-time noise levels are ~13 dBA lower. The detailed results are presented in Appendix H.

Daytime	Nighttime
65	52

Table 13.10: Worst case traffic noise at exposed elevations (Scenario 7)

Units = dB $LA_{eq\ T}$ free field at most exposed dwelling

Noise levels on the sheltered elevations are typically at least 10 dBA lower than the exposed elevations and in the case of dwellings along the A71 are predicted to be < 55 dB $LA_{eq\ 07:00\ -\ 23:00}$ in private garden areas with the 4m barrier/bund and appropriate site layout measures in place.

Internal noise levels with open windows shown in Table 13.11 and subsequent Tables assume a reduction of 15 dBA based on WHO rule of thumb estimates. Noise levels have also been calculated inside dwellings in accordance with the method set out in BS 8233:2014. These results are presented in Appendix 4.

Based on the BS 8233 calculations, noise is predicted to comply with internal target levels inside all dwellings provided all windows on exposed elevations are fitted with an improved specification for glazing units and improved trickle vents. These results are summarised in Table 13.11 below.

Location	Daytime	Nighttime
External	65	52
Internal (open window)	50	37
Internal (with trickle vent)	35	25

Table 13.11: Worst case at exposed elevation

Units = dB $LA_{eq\ T}$ free field at most exposed dwelling

The predicted noise levels at sheltered elevations indicate that trickle vents would be advisable to protect amenity and prevent sleep disturbance. See Table 13.12 below.

Location	Daytime	Nighttime
External	55	44
Internal (open window)	40	29
Internal (with trickle vent)	30	<20

Table 13.11: Worst case at sheltered elevation

Units = dB $LA_{eq\ T}$ free field at most exposed dwelling

13.5.4 Uncertainty

The method used to predict noise from road traffic is based on the statutory method prescribed by the Noise Insulation Regulations. This does not include an estimate for uncertainty. The results from the comparison between measured and predicted levels for Scenario 1 indicate that the model predictions are robust.

13.6 Mitigation

13.6.1 Construction Noise

Noise during construction has the potential to cause annoyance. The management of construction noise will be handled by the Principle Contractor. The following procedures shall be adopted to ensure that noise impacts from construction operations are minimised, to protect local amenity:

- Prior to the commencement of each phase of construction, the appointed contractors shall prepare a method statement for the project. This shall include an assessment of potential noisy operations and outline the noise mitigation measures proposed. The construction noise impact assessment shall be used to help inform the development of the detailed construction methods.
- The contractors shall be required to select the quietest item of suitable plant available for all site operations. The work programme on site shall also be phased to reduce the combined impacts arising from several noisy construction operations, to reduce adverse impacts. Where practicable, noise from fixed plant and equipment shall be contained within suitable acoustic enclosures or behind acoustic screens.
- Any plant and equipment required for operation at night (23:00 – 07:00) e.g. for dewatering and security lighting shall be mains electric powered where practicable.
- The site contractors shall conduct all site operations in accordance with accredited documented procedures. This shall include a complaint investigation procedure.
- All sub-contractors appointed by the main contractor shall be formally required through contract to comply with all environmental noise conditions.

13.6.2 Operational Mitigation

The final layout for the proposed development shall be amended to ensure that noise from road traffic does not exceed 55 dB $LA_{eq\ 07:00\ -\ 23:00}$ in all private gardens. This shall include measures to optimise the orientation of buildings and the erection of a 4m high acoustic barrier next to the A71.

Following the revision of the proposed layout the applicant shall submit details of the scheme for acoustic insulation to ensure that noise from road traffic inside habitable rooms does not exceed the WHO criteria set out in Table 13.3.

This shall include:

- The adoption of appropriate measures in the design and layout of buildings, where all windows of habitable rooms exposed to a predicted noise level >59 dB $LA_{eq\ 07:00\ -\ 23:00}$ shall be fitted with an *improved* scheme of acoustic insulation. All windows within *improved* mitigation shall be fitted with double glazing with a minimum sound reduction index of 33 dB R_w, and trickle vents with a minimum sound reduction index of 39 dB $D_{n,ew}\ C_{tr}$. The zone for *improved* acoustic insulation is shown in Figure 13.3.
- All windows with *standard* mitigation shall be fitted with double glazing with a minimum sound reduction index of 33 dB R_w, and trickle vents with a minimum sound reduction index of 39 dB D_{ne}. These acoustic ratings are based on the standard values provided within BS 8233:2014. The zone for *standard* acoustic insulation is shown in Figure 13.3.

13.7 Conclusion

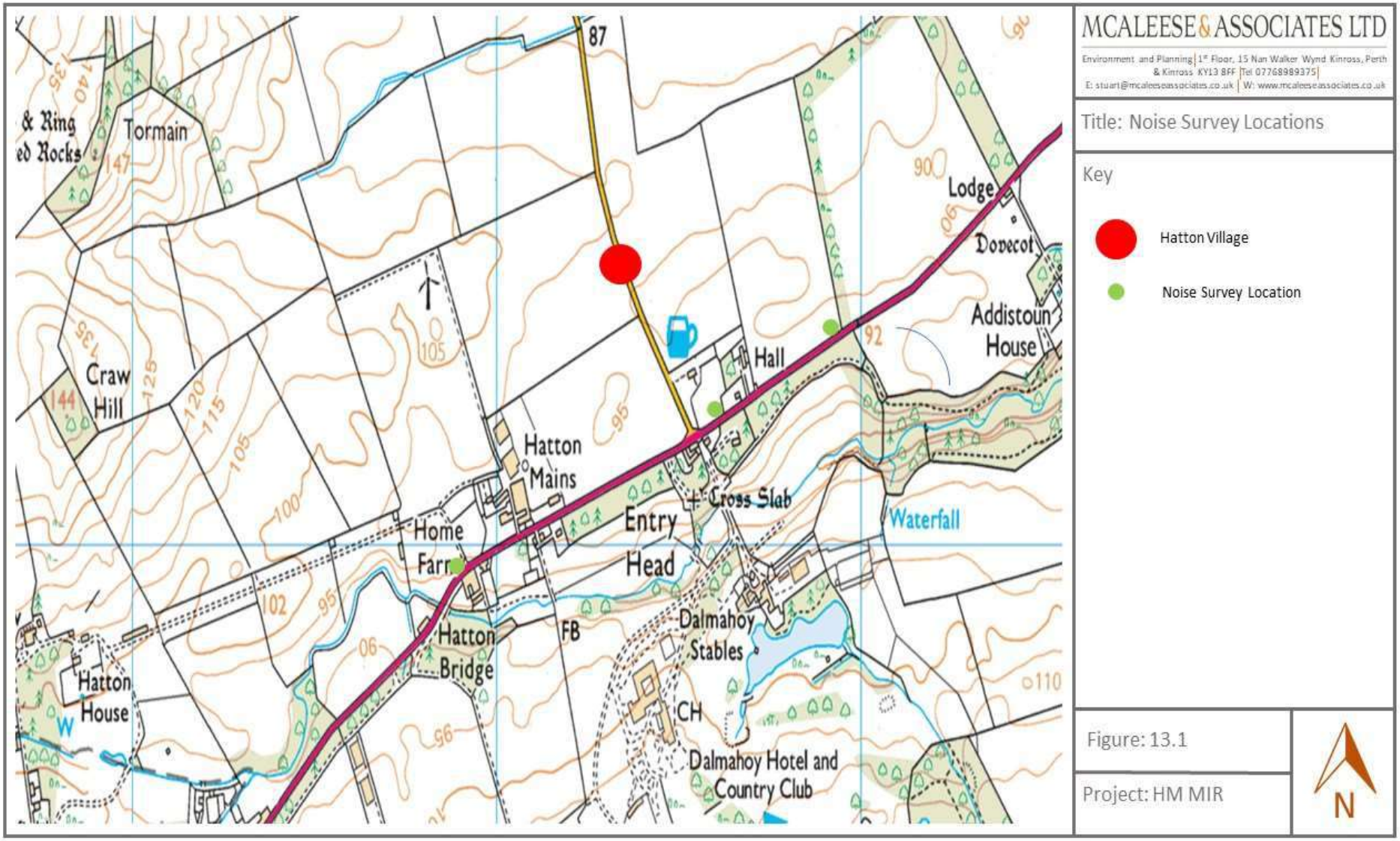
The predicted change in noise from road traffic is of minor adverse significance or less at all sensitive receptors considered within the study area with the exception of the dwellings at Ransfield Cottages on Dalmahoy Road. The impacts at Ransfield Cottages is predicted to be of Moderate Adverse Significance in terms of the assessment framework set out in Table 13.4.

The impacts have been assessed in accordance with WHO environmental noise criteria. Noise levels along the A71 are relatively high and substantial mitigation measures are likely to be required to protect health and residential amenity.

The proposed stand-off buffer zones and zoning of land uses within the Masterplan should ensure that noise from the agricultural buildings and the hotel are unlikely to adversely affect noise sensitive receptors. Impacts from road traffic are limited to areas adjacent to roads.

The predicted noise levels at the school comply with the WHO criterion for outdoor learning.

This assessment identifies zones where mitigation measures are required to protect health and amenity. These mitigation measures may include avoiding noise sensitive development in noisy areas, use of layout and design to reduce noise in private gardens and, where appropriate, use of double glazing to ensure that noise inside dwellings will comply with WHO criteria. A further noise assessment will be conducted at detailed planning stage to ensure that the impacts on future residents are minimised.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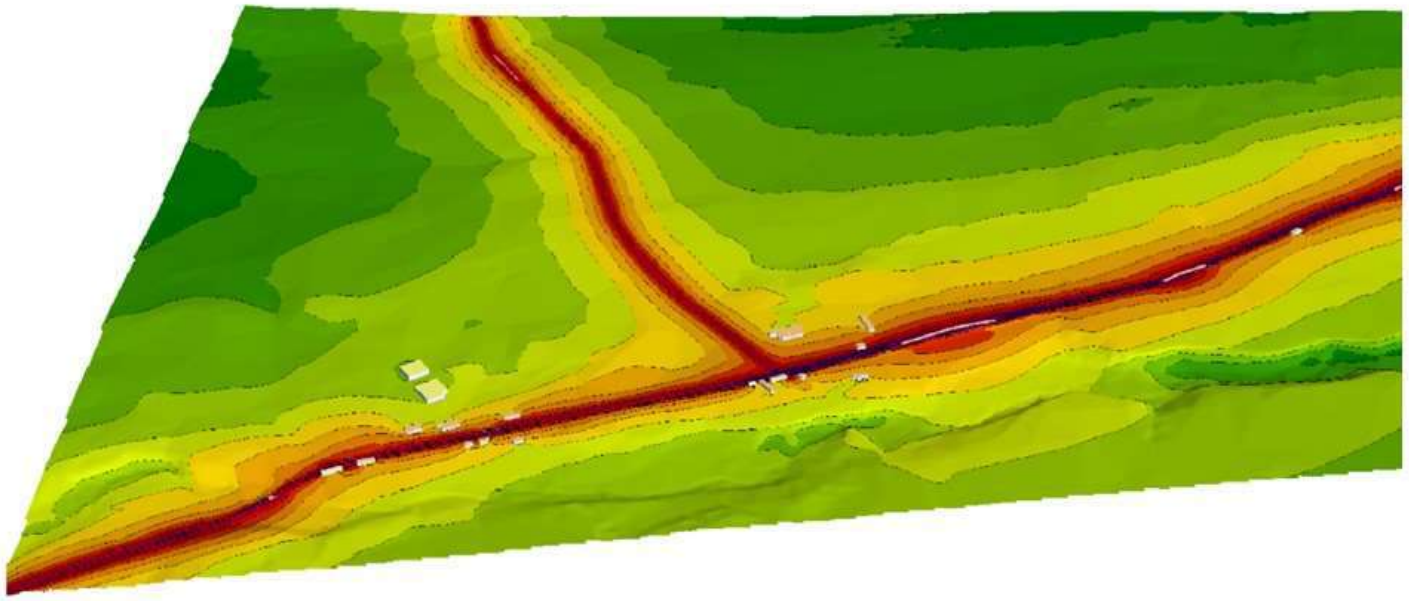
E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
Title: Noise Survey Locations
Key
Hatton Village
Noise Survey Location
Figure: 13.1
Project: HM MIR
N
87
Tormain
Craw Hill
Lodge
Dovecot
Addistoun House
Hall
Hatton Mains
Cross Slab
Waterfall
Entry Head
Home Farm
Hatton Bridge
FB
Dalmahoy Stables
CH
Dalmahoy Hotel and Country Club
Hatton House



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E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk

Title: Noise Model Layout

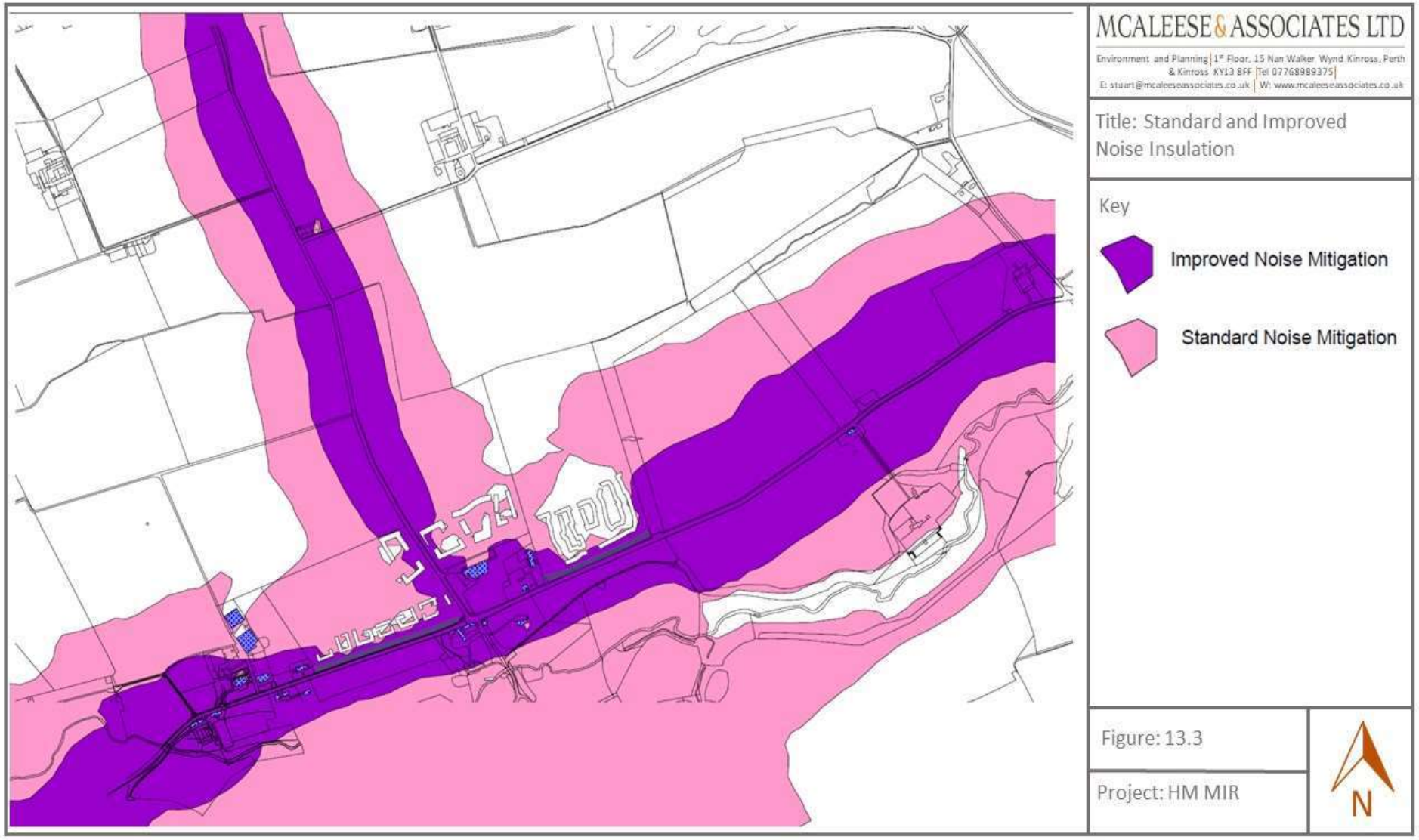
Key

Prediction Model
SoundPlan 8.1
Scenario - 2030 scheme
Model includes existing buildings
16 hour noise
Prediction Method CRTN
Topography based on OS Terrain 5
prediction grid 5m
contours dB LAeq 07:00 - 23:00
1.5m above ground level
assumes soft ground across domain
units = dB LAeq daytime

Figure: 13.2

Project: HM MIR

N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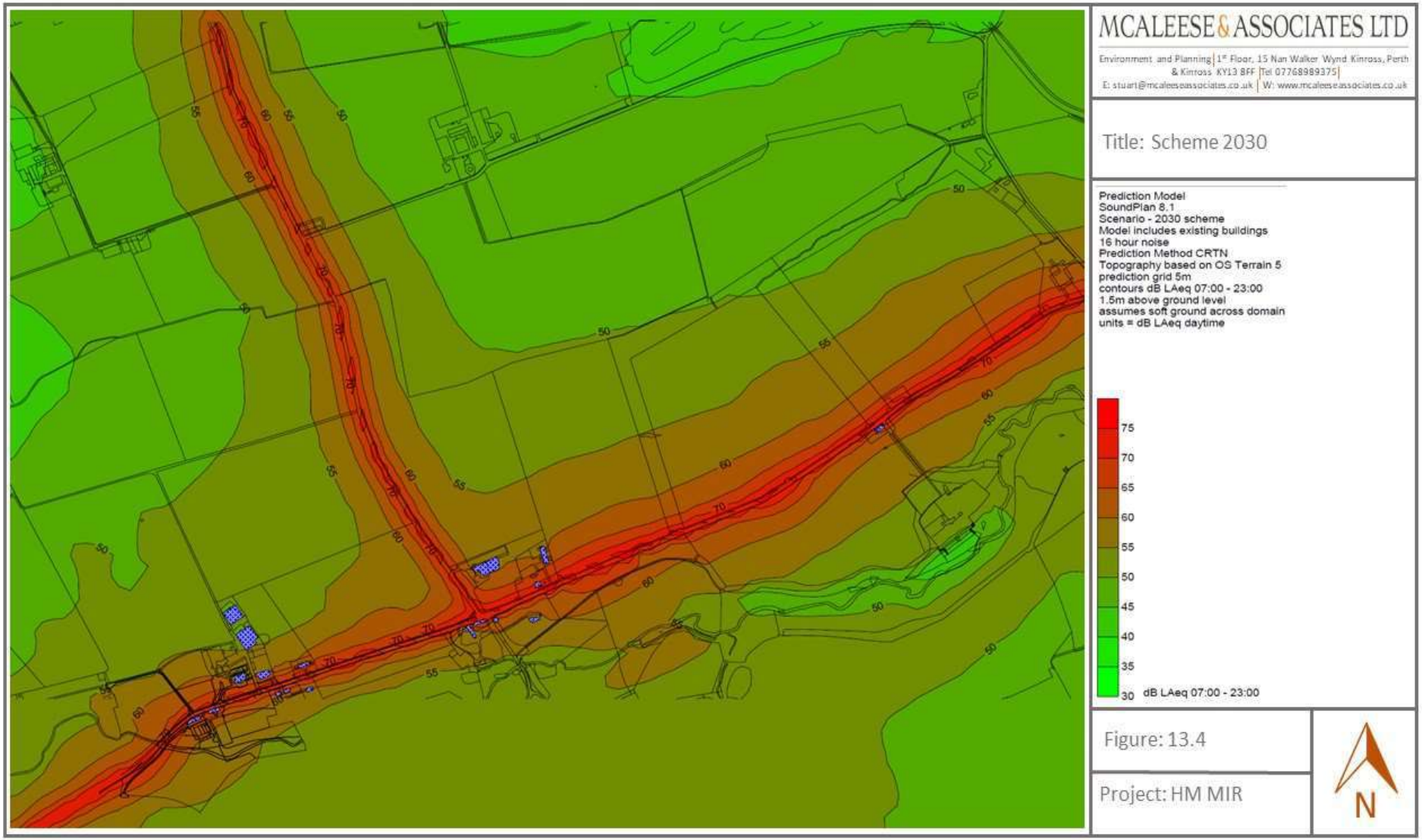
E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
Title: Standard and Improved Noise Insulation
Key
Improved Noise Mitigation
Standard Noise Mitigation
Figure: 13.3
Project: HM MIR
N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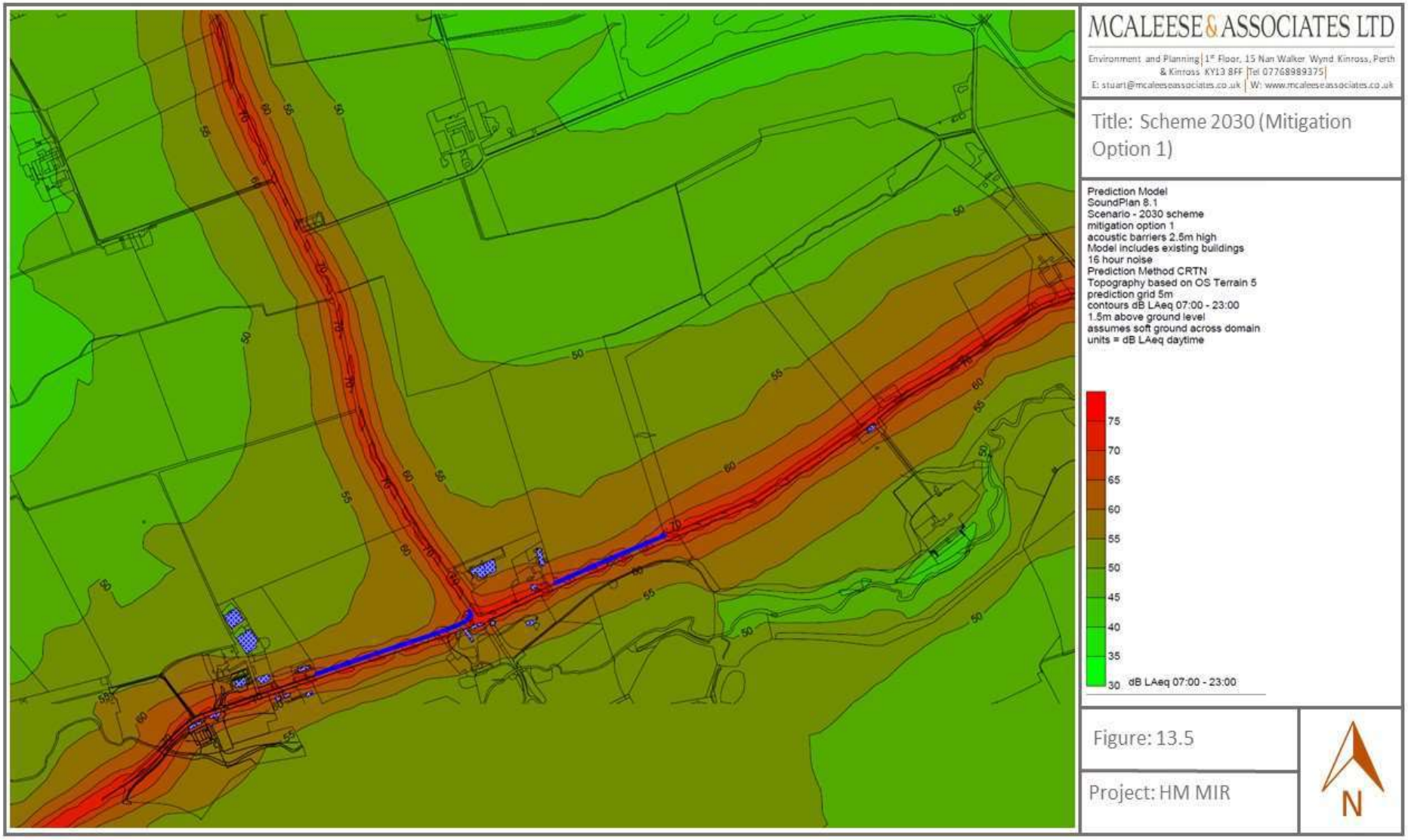
E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
Title: Scheme 2030
Prediction Model
SoundPlan 8.1
Scenario - 2030 scheme
Model includes existing buildings
16 hour noise
Prediction Method CRTN
Topography based on OS Terrain 5
prediction grid 5m
contours dB LAeq 07:00 - 23:00
1.5m above ground level
assumes soft ground across domain
units = dB LAeq daytime
75
70
65
60
55
50
45
40
35
30
dB LAeq 07:00 - 23:00
Figure: 13.4
Project: HM MIR
N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Title: Scheme 2030 (Mitigation Option 1)
Prediction Model
SoundPlan 8.1
Scenario - 2030 scheme
mitigation option 1
acoustic barriers 2.5m high
Model includes existing buildings
16 hour noise
Prediction Method CRTN
Topography based on OS Terrain 5
prediction grid 5m
contours dB LAeq 07:00 - 23:00
1.5m above ground level
assumes soft ground across domain
units = dB LAeq daytime
75
70
65
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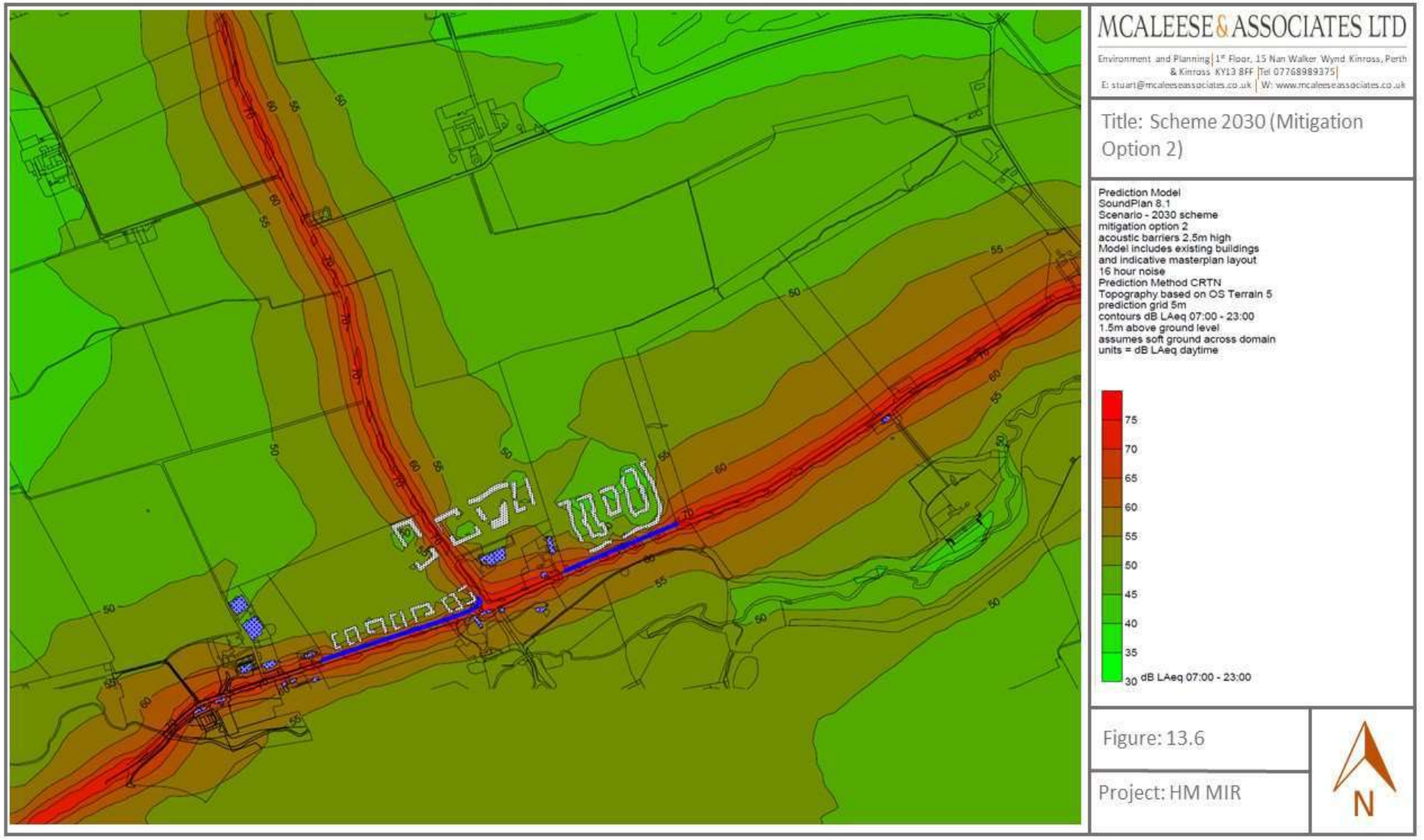
dB LAeq 07:00 - 23:00
Figure: 13.5
Project: HM MIR
N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Title: Scheme 2030 (Mitigation Option 2)
Prediction Model
SoundPlan 8.1
Scenario - 2030 scheme
mitigation option 2
acoustic barriers 2.5m high
Model includes existing buildings
and indicative masterplan layout
16 hour noise
Prediction Method CRTN
Topography based on OS Terrain 5
prediction grid 5m
contours dB LAeq 07:00 - 23:00
1.5m above ground level
assumes soft ground across domain
units = dB LAeq daytime
75
70
65
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dB LAeq 07:00 - 23:00
Figure: 13.6
Project: HM MIR
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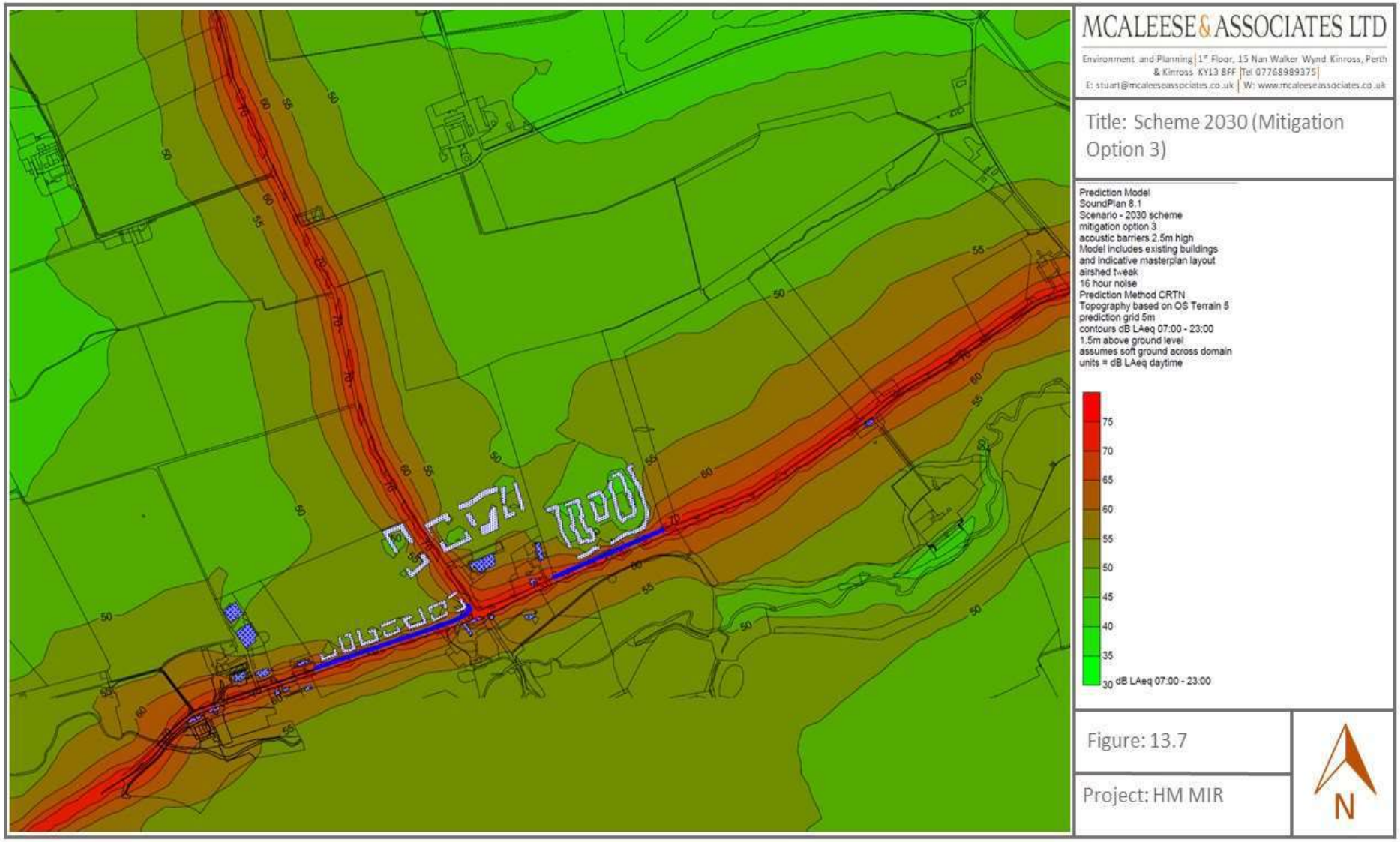
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E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
Title: Scheme 2030 (Mitigation Option 3)
Prediction Model
SoundPlan 8.1
Scenario - 2030 scheme
mitigation option 3
acoustic barriers 2.5m high
Model includes existing buildings
and indicative masterplan layout
airshed tweak
16 hour noise
Prediction Method CRTN
Topography based on OS Terrain 5
prediction grid 5m
contours dB LAeq 07:00 - 23:00
1.5m above ground level
assumes soft ground across domain
units = dB LAeq daytime
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65
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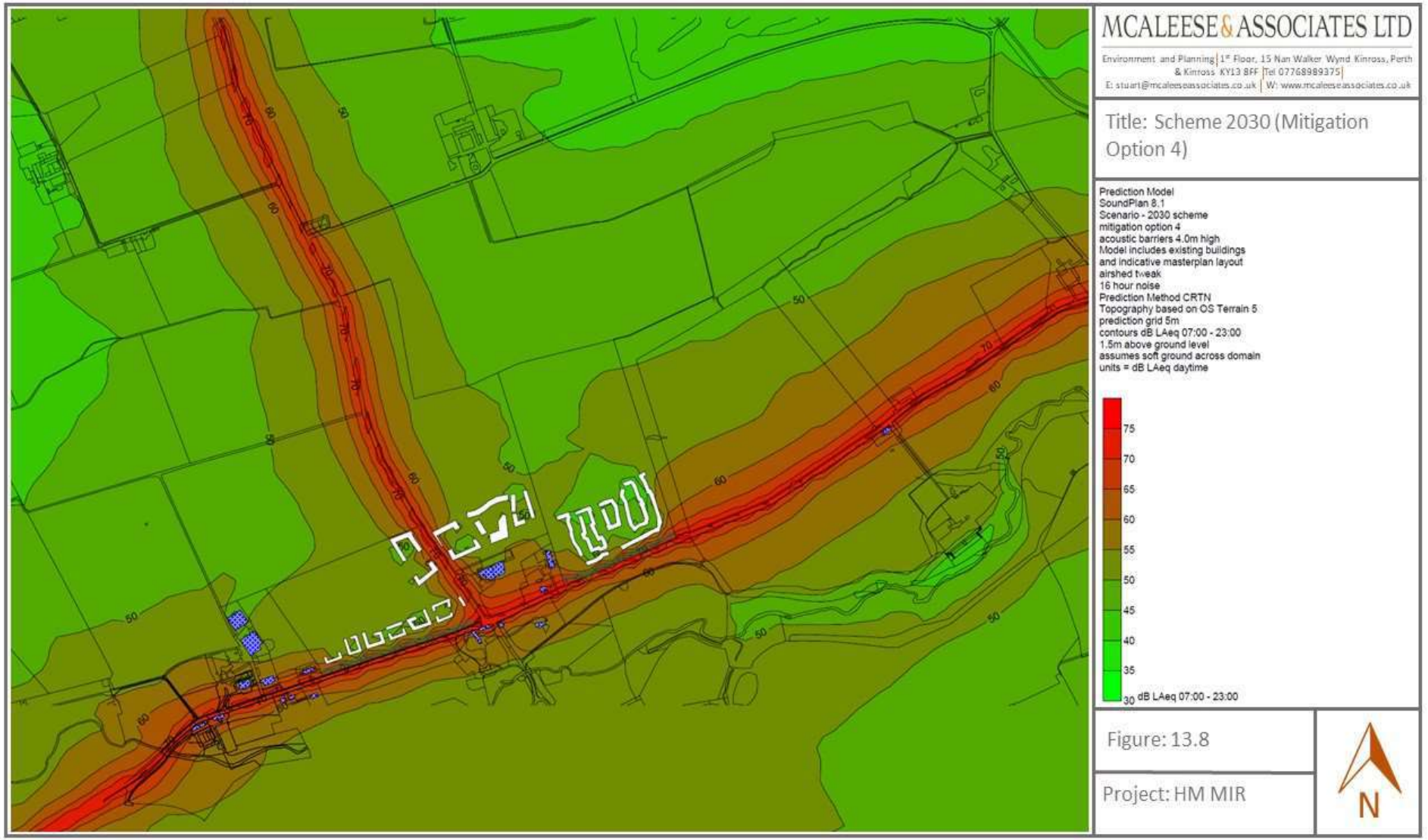
dB LAeq 07:00 - 23:00
Figure: 13.7
Project: HM MIR
N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E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
Title: Scheme 2030 (Mitigation Option 4)
Prediction Model
SoundPlan 8.1
Scenario - 2030 scheme
mitigation option 4
acoustic barriers 4.0m high
Model includes existing buildings
and indicative masterplan layout
airshed tweak
16 hour noise
Prediction Method CRTN
Topography based on OS Terrain 5
prediction grid 5m
contours dB LAeq 07:00 - 23:00
1.5m above ground level
assumes soft ground across domain
units = dB LAeq daytime
75
70
65
60
55
50
45
40
35
30
dB LAeq 07:00 - 23:00
Figure: 13.8
Project: HM MIR
N

14

Chapter 14

Traffic and Transport

MCALEESE & ASSOCIATES LTD

Chapter 14 Traffic and Transport

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14. Traffic and Transport

14.1 Introduction

This chapter has been prepared by AECOM Ltd and assesses potential environmental effects as a measure of the impact of increased Average Daily Flow (ADF) associated with the operation of Hatton Mains (the Development) in accordance with the Guidelines for the Environmental Assessment of Road Traffic published by the Institute of Environmental Management and Assessment (IEMA) 1993.

The proposed development relates to the construction of approximately 1,200 residential units, 2,500 m^2 of retail space, a 2,500 m^2 primary school and nursery, 1,000 m^2 of community/health facilities and 1,000 m^2 of leisure space. The proposed development site ('the Site') is located to the north of the A71 opposite Dalmahoy Golf Course, south of Ratho and approximately 12 km to the west of Edinburgh City Centre. Dalmahoy Road bisects the Site.

Vehicular access to The Site would be by means of new priority junctions formed with Dalmahoy Road and via a left-in / left-out only access with the A71. These access points would also be capable of accommodating pedestrians and cyclists, additionally a network of residential streets and dedicated paths would provide connectivity through The Site to the Village centre as well as connecting to the A71 to the south and Ratho to the north.

It is recognised that there is a requirement for the proposed development to compliment and support existing national and local policy which emphasises that priority is given to sustainable travel moreover given there is a need to consider anticipated changes to how people live and work. The following transport related interventions and strategies form part of proposed development:

- Promotion of car club usage through the provision of car club parking throughout;
- Inclusion of a 'working from home' hub within the proposed development that will seek to reduce the number of private car trips associated with commuting to work;
- Bicycle rental schemes to provide residents with an alternative to car usage;
- Safeguarding land adjacent to the A71 to allow for the planned A71 cycle path to be constructed and integrate with the proposed development;
- The inclusion of a Public Transport Strategy to identify the public transport demand of the proposed development and the means in which bus services can be improved to offer increase accessibility to and from the proposed development and reduce private car trips.

It is anticipated that the inclusion of the interventions and strategies listed above will result in the achievement of the modal share target stated in the Transport Assessment (TA).

It is anticipated that subject to planning consent, construction would be completed by 2030 at a rate of approximately 100 – 150 dwellings per year.

This chapter should be read in conjunction with the TA prepared by AECOM Ltd and presented in Appendix I. The TA provides a detailed review of the operational characteristics of the proposed development and assesses the operational impacts of the proposed development with a focus on sustainable transport accessibility and peak hour junction performance. The TA also includes a Framework Construction Traffic Management Plan (CTMP) designed to mitigate the temporary impacts and effects of the construction of the proposed development, which would be phased over an approximate ten-year period. This chapter differs from the TA by focusing on operational ADF impacts on a road link as opposed to operational peak hour junction performance. Moreover, the scope, parameters, assessment methodology and guidelines of a TA and Environmental Assessment Report (EAR) differ. Where applicable, the proposed development's TA is referenced within this chapter.

The specific objectives of this chapter are to:

- Provide an overview of the planning policies and guidance associated with this assessment and the proposed development;
- Detail the assessment methodology;

- Describe the baseline conditions of the local transport network;
- Describe the operational characteristics of the proposed development;
- Assess the impacts of traffic associated with the proposed development including cumulative impacts;
- Describe the significance of potential environmental effects;
- Detail any proposed mitigation measures that seek to lessen the impacts and effects; and
- Assess any residual effects that are expected to remain following the implementation of the mitigation measures.

14.2 Planning Policy

14.2.1 National Planning Policy

National Transport Strategy (2016)

Scotland's National Transport Strategy (NTS) was first published in 2006 and subsequently updated in 2016 to reflect the changing government strategies, varying local and national challenges and an increase in powers being devolved to the Scottish Government. The NTS establishes a framework for enabling economic growth and improving the lives of individuals and communities the provision of transport infrastructure to enable increased connectivity. Within the NTS, there are five high level objectives that form the foundation of the Scottish Government's transport objectives for the next 20 years.

The objectives include:

- Promote economic growth:
  - *"An accessible Scotland with safe, integrated and reliable transport that supports economic growth"*
- Promote social inclusion:
  - *"A transport system that meets everyone's needs"*
- Protect our environment and improve health:
  - "[A transport system that] *respects our environment and contributes to health"*
- Improve safety of journeys:
  - "[A transport system with] services recognized internationally for quality, technology and innovation, and for effectives and well-maintained networks"
- Improve integration:
  - *"A culture where transport providers and planners respond to the changing needs of businesses, communities and users, and where one ticket will get you anywhere."*

The proposed development seeks to promote economic growth in the Edinburgh area and throughout the central belt of Scotland by addressing the critical shortage in housing. The operation of the proposed development will contribute to an increase in employment for both skilled and non-skilled workers through the provision of retail, leisure, educational and community facilities. Furthermore, the skills and expertise associated with residents of the proposed development would contribute to economic growth.

The inclusion of high-quality pedestrian and cycle infrastructure throughout the proposed development and the safeguarding of a connection with the planned A71 cycle corridor will provide residents with the opportunity to change their travel habits in favour of sustainable travel modes that would also contribute to an improvement in health. There are several long-distance routes in the vicinity of the proposed development that can be accessed that would promote recreational walking and cycling; therefore contributing to an improvement in health.

The proposed development will integrate into current public transport services along the A71 and through the village of Ratho to provide residents with a viable and attractive alternative to private car use. An increase in public transport services and frequency will enable users to interchange with wider bus services from the Hermiston Park and Ride.

Scottish Planning Policy (2014)

SPP produced in June 2014 by the Scottish Government identifies the main priorities for the planning system from a national perspective. SPP identifies three major ways in which it should be used: for

the preparation of development plans, the design of new developments as well as the determination of planning appeals.

SPP is a non-statutory planning document which sits in a suite of wider planning policy documents including National Planning Framework 3 (2014), Creating Places (2013) and Designing Streets (2010). As part of its placemaking agenda, SPP incorporates four key principles that new developments should adhere to:

- A successful, sustainable place;
- A natural, resilient place;
- A connected place; and
- A low carbon place.

Of these four policy principles, transportation elements are contained within the 'a connected place' element. The key transport priorities are identified in Paragraph 270 and state:

- Optimise the use of existing infrastructure;
- Reduce the need to travel;
- Provide safe and convenient opportunities for walking and cycling for both active travel and recreation and facilitate travel by public transport; and
- Enable the integration of transport modes.

A key element of SPP in terms of transportation is in ensuring that new development sites are accessible by sustainable modes including on foot and by bicycle (Paragraph 273). Amongst other mechanisms, Paragraph 287 also identifies that new developments should facilitate travel by public transport, including, where appropriate, the provision of bus stop facilities within a 400 m walking distance. Accessibility to the proposed development by sustainable modes of transport has been assessed in detail in the TA.

14.2.2 Regional Transport Planning Policies and Strategies

South East of Scotland Transport Partnership (SEStran) Regional Transport Strategy Refresh 2015-2025 (2016)

SEStran is one of seven Regional Transport Partnerships (RTPs) in Scotland and covers eight local authority areas including the administrative area of the City of Edinburgh Council (CEC). The updated Regional Transport Strategy (RTS) provides a strategic framework for transport provision up to 2025. The RTS outlines the main priorities for SEStran's local authorities as:

- Integrate land use and transport planning;
- Increase the rate of walking and cycling;
- Improve road safety; and
- Reduce greenhouse gas emissions and improve air quality.

Section 4.4.6 of the RTS Refresh identifies that "*new developments* [should be] *sustainable and residents are able to travel without having to use a car*." Section 4.4.8 goes on to state that *"active travel modes are crucial and should be promoted through design and implementation of all new development and transport interventions…"*

As mentioned previously, the proposed development will provide residents with the opportunity to change their travel habits in favour of sustainable transport through the provision of high-quality walking and cycling infrastructure, increased public transport provision and the creation of attractive places by adhering to design guidance e.g. *Designing Streets*. Road safety within the proposed development will be promoted through various measures including speed restrictions, traffic calming, pedestrian crossings etc. A reduction in car use in favour of sustainable modes of travel will result in an overall reduction in greenhouse gas emissions and therefore improve air quality.

SESplan Strategic Development Plan (2016)

SESplan includes six local authorities (CEC, East Lothian, Fife, Midlothian, Scottish Borders and West Lothian) which make up the SESplan Strategic Development Planning Authority (SDPA). This Strategic Development Plan (SDP) intends to set out a vison for the SDPA's views for future

developments along with the Spatial Strategy on future development and land use in the area. The plan covers the period from 2018 to 2030.

Part of the SESplan SDP vision is for the Edinburgh City Region to become "*a healthier, more prosperous and sustainable place*" and aims to:

- Enable growth in the economy;
- Set out a strategy to enable delivery of housing requirements to support growth and meet housing needs;
- Integrate land use and sustainable modes of transport; and
- Promote green networks.

The SDP contains various policies. Of relevance to the proposed development is Policy 8 which is entitled "Transportation" This specifies that developments should be "*capable of being well served by public transport and that are accessible by foot and cycle, to reduce the need to travel by private car*".

As mentioned previously and as shown in the TA, the proposed development is situated on the A71 corridor which is currently served by several bus services and is an area which is under investigation for an expansion of future services. It is anticipated that the proposed development will be seen as an attractive opportunity for public transport operators which will result in frequent services directly from the Site to destinations including Edinburgh City Centre and Livingston.

14.2.3 Local Transport Policies and Strategies

Edinburgh Local Development Plan (2016)

The Edinburgh Local Development Plan (LDP) was adopted by CEC in November 2016 and replaces the Edinburgh City Local Plan and Rural West Edinburgh Local Plan. The plan sets out the proposals and policies relating to the development of land in the Edinburgh area for a period of 5 to 10 years from the date of adoption in 2016.

The vision of the LDP is to "help make Edinburgh the best place it can be, for everyone, now and in the future." The LDP aims to:

- Support the growth of the city's economy;
- Help increase the number and improve the quality of new homes being built;
- Help ensure that the citizens of Edinburgh can get around easily by sustainable transport modes to access jobs and services;
- Look after and improve our environment for future generations in a changing climate; and
- Help create strong, sustainable and healthier communities, enabling all residents to enjoy a high quality of life.

Although the proposed development is not yet included in the future LDP – the *2030 City Plan* – the planning and design complies with the policies and guidelines set out in the current LDP. This ensures that the foundation of its planning and design are based on acceptable standards and practices.

14.3 Assessment Methodology and Significance Criteria

14.3.1 Engagement

Scoping discussions were held with Transport Scotland, City of Edinburgh Council and West Lothian Council to establish the scope of this ES chapter and the supporting TA. The Study Area – the area in which the impact of the proposed development will be assessed – was outlined and it was agreed that an evidence-based approach to determining the impacts was necessary. Consequently, 2011 census data for the neighbouring village of Ratho was used to determine traffic distribution by using workplace location information and Google Maps to identify the likely roads that residents would take when commuting to and from their place of work.

The ADF of the proposed development was calculated by using the 12-hour output from TRICS 7.5.4 and multiplying it by the remaining 12-hour traffic concentration that was observed over a 7-day period in the village of Ratho to establish a 24-hour profile.

A meeting was held with Lothian Buses on 21/01/2019 to discuss the design requirements of the proposed development to ensure that bus services can be provided within the boundary of the Site and to identify any future plans for an expansion of services that can be used by residents. It was established that the A71 is viewed as an excellent opportunity for growth in relation to public transport services and that under current plans, residents would use services on the A71 to interchange with wider services at the Hermiston Park and Ride. It is anticipated that the proposed expansion of public transport services will be a key factor in minimising private car usage by residents of the proposed development.

14.3.2 Impacts Scoped Out

This chapter of the ES only assesses the impact of the residential dwellings of the proposed development as it is anticipated that vehicle movements associated with the proposed primary school and community, retail and leisure facilities would be considered as linked internal trips and thus result in a negligible increase in movements. This has been agreed through scoping discussions with CEC and TS.

As construction is expected to last approximately 10 years at a maximum rate of approximately 150 dwellings per year, construction traffic has been scoped out of this assessment due to the changing baseline conditions over the intervening construction period, moreover the operational impact of the proposed development represents the worst-case impact in terms of ADF. The Framework CTMP included in the TA provides further detail on the volume and type of construction traffic as well as detailing measures to manage and mitigate construction traffic impacts for users of the transport network.

The impact of traffic associated with the proposed development on junctions within the Study Area is not considered in this chapter as it is assessed in detail within the TA.

14.3.3 Guidance

This chapter has been prepared taking due cognisance of the Town and County Planning Environmental Impact Assessment (EIA) (Scotland) Regulations 2017. This is complemented by the Planning Circular 1 2017: EIA Regulations 2017.

The Institute of Highways and Transportation (IHT), now the Chartered IHT, publication Guidelines for Traffic Impact Assessment 1994 recommends that traffic and transport effects within EIAs should be assessed in accordance with the IEMA Guidelines (1993).

The IEMA Guidelines (1993) recommend that the following rules are considered when assessing the increase in ADF flow associated with a proposed development on highway links and when identifying the area of influence for assessment purposes:

- Rule 1: Include highway links where traffic flows would increase by more than 30% (or the number of Heavy Goods Vehicles (HGVs) would increase by more than 30%; and
- Rule 2: Include any especially sensitive areas where traffic flows would increase by 10% or more.

The IEMA Guidelines (1993) acknowledge that day-to-day variations of traffic on a road can frequently be at least + or – 10%. At a basic level, it should therefore be assumed that projected changes in traffic of less than 10% create no discernible environmental impact. Absolute changes (number of vehicles) are equally relevant since percentages alone could be misleading.

It is considered that the 30% threshold from the IEMA Guidelines (1993) is, in the main, the appropriate rule to apply when assessing the impact of the proposed development on the local road network. This rule has been used to determine the extent of the study area and to identify the road links within the study area that may warrant a full assessment of environmental effects. Moreover, road links which may be considered to be sensitive are also identified.

14.3.4 Study Area

The study area for the assessment of potential transport and access impacts and effects extends from the Site to include:

- A71 / Calder Road – a single (and partially dual) carriageway road which runs from the Saughton Road / Longstone Road / A71 Calder Road roundabout in the east to the A71 / B7031 junction at The Camps in the west;
- B7015 – a single-carriageway road which runs from its junction with the A71 to the Camps Industrial Estate, West Lothian;
- Dalmahoy Road – a rural single-carriageway road which connects the village of Ratho to the A71;
- Main Street, Ratho – a single-carriageway road which runs through the centre of the village of Ratho;
- Harvest Road – a single-carriageway road that runs from south of Ratho Station to its junction with the B7030 / Cliftonhall Road; and
- Curriehill Road – a single-carriageway road which links the town of Currie to the A71.

The identification of the study area corresponds with the IEMA Guidelines (1993) considering the anticipated routing of vehicles associated with the proposed development. The extent of the study area is shown in Figure 14.1.

The aforementioned roads will form the basis of the assessment of the impacts of the proposed development as a measure of the percentage change in ADF. To assess the impact, it is necessary to obtain baseline ADF for these roads.

14.3.5 Surveys Undertaken

Automatic Traffic Counters (ATCs) were deployed at the locations shown in Figure 14.2 over a continuous seven-day period from 29/01/2019 to 04/02/2019 to capture ADF in the study area. The ADF can be broken down into vehicle classifications.

14.3.6 Assessment Effects

The transport and access assessment is structured around the consideration of potential environmental effects as identified by the IEMA Guidelines (1993), including the following:

- Noise;
- Visual Impact;
- Severance;
- Driver Delay;
- Pedestrian Amenity;
- Accidents and Safety;
- Hazardous Loads;
- Air Pollution; and
- Dust and Dirt.

Potential significant environmental effects associated with noise, visual impact and air quality are addressed in their respective chapters.

It is considered that there would be no hazardous loads delivered to The Site and therefore this potential environmental effect has not been assessed.

14.3.7 Assessment of Significance

The magnitude of the environmental effect associated with transport and access and the significance of any effect is assessed in this chapter.

As per IEMA Guidelines (1993) the magnitude is defined as the "level of change" and whether the effect is significant or not will largely depend on the number of people affected. With regards to significance the IEMA Guidelines (1993) state that: *"for many effects there are no simple rules or formulae which define the thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed-up by data or quantified information wherever possible. Such judgements will include the assessment of the numbers of people experiencing a change in environmental impact as well as the assessment of the damage to various natural resources."*

14.3.8 Magnitude and Sensitivity

In terms of the magnitude of impact (level of change), the IEMA Guidelines (1993) point to changes in traffic in excess of 30%, 60% and 90% as being representative of "slight", "moderate" and "substantial" impacts, respectively. Table 14.1 reflects the IEMA Guidelines (1993) and has been used to quantify the magnitude of impact associated with traffic related to the proposed development. As indicated previously, the IEMA Guidelines (1993) relate to the operational impacts of development only.

Magnitude	Impact
Substantial	Considerable deterioration/improvement in local conditions or circumstances (+90% increase in traffic)
Moderate	Readily apparent change in conditions or circumstances (60% – 90% increase in traffic)
Slight	Perceptible change in conditions or circumstances (30% – 60% increase in traffic)
Negligible	Very small change in conditions or circumstances (10% – 30% increase in traffic); and
No Impact	No discernible change in conditions (– 10% increase in traffic).

Table 14.1: Magnitude of Traffic Impact

Where the predicted increase in traffic volume (general traffic or HGV only) is lower than IEMA Guidelines (1993) Rule 1 (30%) the significance of the effects can be stated to be Not Significant meaning that further detailed assessments are not warranted.

In order to determine the magnitude of effect associated with traffic impacts Table 14.2 has been utilised in tandem with due professional judgement.

The magnitude of traffic effect is a function of the existing traffic volumes, the percentage increase and change due to a proposed development, the changes in type of traffic, and the temporal distribution of traffic (day of week, time of day). The determination of magnitude has been undertaken by reviewing the characteristics of the proposed development, establishing the parameters of roads within the study area that may be affected and quantifying impacts. The Design Manual for Roads and Bridges (DMRB)[1] has been used to determine the characteristics of study area roads in respect of carrying capacity thus assisting in determining the sensitivity to change in respect of vehicles related to the proposed development as a consequence of residual capacity.

Consideration has been given to the composition of traffic on the road network, under both existing and proposed conditions.

It is important to utilise due professional judgment when considering the magnitude of impact and effect particularly when considering percentage increases. For example the magnitude of impact may be considered to be "substantial" as per Table 14.1, however the resultant magnitude of effect may be considered to be "small" as per

when the characteristics of the proposed development and road network are considered.

[1] The Department for Transport (2002). Design Manual for Roads and Bridges Volume 13, Section 1, Part 5. DfT

Magnitude	Definitions
Large	The proposed development could result in a significant change in terms of length and/or duration to the present traffic routes or schedules or activities, which may result in hardship.
Medium	The proposed development could result in changes to the existing traffic routes or activities such that some delays or rescheduling could be required, which cause inconvenience.
Small	The proposed development could occasionally cause a minor modification to routes, or a very slight delay in present schedules, or on activities in the short term.
Negligible	No effect on movement of road traffic above normal level.

Table 14.2: Magnitude of Effect

In tandem with the magnitude of effect it is necessary to determine the sensitivity of receptors to changes in transport and traffic characteristics. In the case of the proposed development receptors of sensitivity are roads, communities and businesses within the study area, detailed further in the baseline section of this chapter. Table 14.3 details the criteria used to determine receptor sensitivity.

Receptor Sensitivity / Importance	Description
High	People whose livelihood depends upon unrestricted movement within their environment; this includes commercial drivers and the companies who employ them. Local residents whose daily activities depend upon unrestricted movement within their environment. Receptors such as schools, colleges and accident hotspots.
Medium	People who pass through or habitually use the area but whose livelihood is not wholly dependent on free access. Receptors such as congested junctions, hospitals, cemeteries and conservation areas.
Low	Occasional users of the road network. Receptors such as public open space and residential areas. Areas with trunk road or A class roads constructed to accommodate significant HGV volumes.
Negligible	Users not sensitive to transport effects. Includes very small settlements and roads with no significant settlements including new strategic trunk roads or motorways.

Table 14.3: Receptor Sensitivity

14.3.9 Significance

As a guide to inform the assessment, but not as a substitute for professional judgement, criteria for determining the significance of traffic and transport related effects is set out in Table . This is based on combining the magnitude of the effect with the receptor sensitivity.

Sensitivity of Receptor	Magnitude of Effect			
	Large	Medium	Small	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

Table 14.4: Significance Criteria

Significance is categorised as major, moderate, minor or negligible. Effects judged to be of major or moderate significance are considered to be Significant in accordance with the EIA Regulations (2017). Effects judged to be of minor or negligible significance are considered Not Significant.

14.4 Baseline Conditions

14.4.1 Introduction

In order to assess the potential impacts of the proposed development, it is necessary to establish the existing baseline characteristics of the study area.

The following sources have been used to inform the baseline review:

- Site visits undertaken in September 2018 and February 2019 by AECOM;
- Desktop review of the Study Area;
- Scotland's Census 2011;
- ATC surveys undertaken in January / February 2019 commissioned by AECOM;
- ATC surveys undertaken in March 2017 provided by FC;
- Publicly available traffic flow data from the Department for Transport (DfT) (www.dft.gov.uk/traffic-counts) for roads within the study area;
- National Road Transport Forecast (NRTF); and
- Publicly available accident statistics from www.roadcrash.co.uk.

14.4.2 Baseline Network Capacity

In order to accurately assess the impact of traffic on the road network, it is first necessary to establish the network's carrying capacity. Table 14.6 illustrates the carrying capacity of the Study Area and is informed by Volume 5, Section 1 (Part 3) and Volume 15, Section 1 (Part 5).

Count Point	Road	DMRB Road Category	Description	Capacity (veh/hr/ direction)	Sensitivity
1	A71	27	Rural – good single 7.3 m	1,200	Low
2	A71	27	Rural – good single 7.3 m	1,200	Low
3	B7015	26	Rural – typical single 7.3 m	1,200	Low
4	A71	27	Rural – good single 7.3 m	1,200	Low
5	A71	27	Rural – good single 7.3 m	1,200	Low
6	Dalmahoy Road	26	Rural – typical single 7.3 m	1,200	Medium
7	Main Street	UAP4	Urban – single 6.1 m	750	High
8	A71	27	Rural – good single 7.3 m	1,200	Low
9	Curriehill Road	26	Rural – typical single 7.3 m	1,200	Low
10	A71	27	Rural – good single 7. 3m	1,200	Low
11	A71 Calder Road	31	Rural – dual 2 lanes	3,400	Low
12	A71 Calder Road	UAP1 (Dual)	Urban – dual carriageway 7.3 m	3,600	Low
13	A71 Calder Road	UAP1 (Dual)	Urban – dual carriageway 7.3 m	3,600	Low
14	A71 Calder Road	UAP1 (Dual)	Urban – dual carriageway 7.3 m	3,600	Low
15	A71 Calder Road	UAP1 (Dual)	Urban – dual carriageway 7.3 m	3,600	Low

16	Harvest Road	27	Rural – good single 7.3m	1,200	Low

Table 14.6: Road Capacities Extracted from DMRB Volume 5 and 15[2]

14.4.3 Baseline Traffic Flow

Table 14.7 details the ADF as calculated from the deployed ATCs. Upon calculation of the ADF for each road link in the Study Area, the results were validated against DfT Traffic Counters in the Study Area such as 80320, 78570 and 80394 to confirm their accuracy.

Count Point	Road	2019 24 Hour Average Daily Traffic Flow			
		Car	Bus	HGV	Total
1	A71	12,333	145	1,626	14,104
2	A71	11,757	134	1,537	13,428
3	B7015	3,461	136	585	4,182
4	A71	15,007	225	1,902	17,134
5	A71	14,115	306	1,902	16,286
6	Dalmahoy Road	1,853	8	327	2,188
7	Main Street	2,784	71	457	3,311
8	A71	15,994	255	1,992	18,241
9	Curriehill Road	2,581	12	297	2,890
10	A71	14,174	299	2,109	16,583
11	A71 Calder Road	25,244	720	3,363	29,328
12	A71 Calder Road	32,290	840	4,943	38,074
13	A71 Calder Road	29,420	547	4,177	34,144
14	A71 Calder Road	27,368	754	4,281	32,403
15	A71 Calder Road	25,832	612	4,131	30,575
16	Harvest Road	2,306	60	457	2,774

Table 14.7: 2019 Baseline Average Daily Flow

As expected, the A71 to the immediate east of the A720 / A71 Calder Road roundabout at Count Point 13 was found to have the highest volume of average daily traffic at 38,074 per day. Count Point 8 – the point closest to the Dalmahoy Road junction with the A71 – was found to have an ADF of 18,241 vehicles.

As construction of the proposed development is anticipated to conclude in 2030, it is necessary to 'factor up' the surveyed traffic flows for 2019 to account for the potential growth in traffic to account for allocated developments in the LDP, cross boundary traffic flows and a general increase in traffic volume. To provide a robust assessment, the traffic flows in Table 14.7 have been factored up using a 'high' growth rate of 1.147 for the expected year of construction completion which is also expected to account for any additional developments in the area. Further information on the methodology used to determine the anticipated increase in traffic within the Study Area is provided in the supporting TA. The results are shown in Table 14.8.

Count Point	Road	2030 24 Hour Average Daily Traffic Flow			
		Car	Bus	HGV	Total
1	A71	14,146	166	1,865	16,178
2	A71	13,485	154	1,763	15,401
3	B7015	3,970	156	671	4,797
4	A71	17,213	258	2,182	19,653
5	A71	16,190	351	2,139	18,680
6	Dalmahoy Road	2,125	10	375	2,510
7	Main Street	3,193	82	524	3,798
8	A71	18,345	292	2,285	20,923
9	Curriehill Road	2,960	14	340	3,314
10	A71 Calder Road	16,258	343	2,419	19,020
11	A71 Calder Road	28,955	826	3,858	33,639

[2] *Source: Table 2 of DMRB Vol 5 Section 1 (Part 3) and Table 5/3/2 of DMRB Vol 15 Section 1 (Part 5)*

Count Point	Road	2030 24 Hour Average Daily Traffic Flow			
		Car	Bus	HGV	Total
12	A71 Calder Road	37,037	964	5,669	43,670
13	A71 Calder Road	33,745	628	4,791	39,163
14	A71 Calder Road	31,391	865	4,910	37,166
15	A71 Calder Road	29,629	702	4,738	35,069
16	Harvest Road	2,645	69	525	3,238

Table 14.8: Anticipated 2030 Average Daily Traffic Flow

14.5 Likely Significant Effects

14.5.1 Proposed Development Characteristics

Due to the residential nature of the proposed development, it is to be expected that a number of different vehicle types will be used throughout and therefore contribute to the environmental impact. It is anticipated that cars will be the main source of traffic emanating from the proposed development as residents travel to and from their place of work and to local amenities. It is recognised that Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs) will also be present due to the retail, leisure and educational facilities that are to be included and the deliveries associated with their operation.

Due to the planned integration with public transport services to promote sustainable travel and minimise car use, buses will also be in operation to, from and within the proposed development. It is expected that there will be a large number of bicycle movements to and from the proposed development each day due to the planned A71 cycle corridor and access to long-distance recreational routes in the vicinity. To assess the worst-case impact of the proposed development, the traffic impact associated with 1,200 dwellings has been used in the anticipated final year of construction in 2030.

14.5.2 Traffic Impact Assessment

The anticipated volume of traffic associated with the proposed development has been determined by using the calculated arrivals and departures from TRICS 7.5.4 and combining them with the proposed modal share. The vehicles associated with the proposed development were then distributed across the local road network in relation to 2011 work location census data for Ratho, Ingliston and Gogar. Table 14.9 illustrates the percentage impact of the proposed development on the anticipated 2030 baseline traffic flows.

Count Point	Road	2030 ADF	Development ADF	2030 Baseline + Development	% Increase
1	A71	16,178	664	16,842	**4.1%**
2	A71	15,401	664	16,065	**4.3%**
3	B7015	4,797	0	4,797	**0%**
4	A71	19,653	664	20,317	**3.4%**
5	A71	18,680	692	19,372	**3.7%**
6	Dalmahoy Road*	2,510	4,551	7,061	**181.3%**
7	Main Street	3,798	642	4,440	**16.9%**
8	A71	20,923	3,122	24,045	**14.9%**
9	Curriehill Road	3,314	173	3,487	**5.2%**
10	A71 Calder Road	19,020	2,949	21,969	**15.5%**
11	A71 Calder Road	33,639	2,949	36,588	**8.8%**
12	A71 Calder Road	43,670	2,020	45,690	**4.6%**
13	A71 Calder Road	39,163	1,788	40,951	**4.6%**
14	A71 Calder Road	37,166	1,652	38,818	**4.4%**

Count Point	Road	2030 ADF	Development ADF	2030 Baseline + Development	% Increase
15	A71 Calder Road	35,069	1,615	36,768	**4.6%**
16	Harvest Road	3,238	642	3,880	**19.8%**
*Count Point 6 is within the proposed development therefore the baseline conditions will change significantly. As a result, it has been excluded from the environmental assessment.					

Table 14.9: Anticipated Traffic Impact of the Proposed Development

Although below the 30% increase in traffic that is recommended for further assessment, the 16.9% increase in traffic that is anticipated to be caused by the proposed development on Main Street, Ratho has been assessed in detail overleaf.

14.5.3 Assessment of Potential Environmental Effects

Due to the determined sensitivity of Main Street, Ratho and the anticipated increase in traffic caused by the proposed development shown in Table 14.9, it is necessary to investigate the possible impact in greater detail.

The potential effects listed in the IEMA Guidelines for the environmental assessment of road traffic are listed below:

- Traffic noise and vibration;
- Visual impact of traffic;
- Severance;
- Journey time increase;
- Pedestrian delay, intimidation and loss of amenity;
- Road accidents and safety; and
- Air pollution.

Traffic Noise and Vibration

Traffic associated with the proposed development has the potential to increase noise and vibration levels Main Street, Ratho as a result of an increase in vehicle movements. This would be a permanent effect but would vary in relation to the proposed development's evolving modal share and would likely only affect those living in close proximity to Main Street.

The IEA Guidelines suggest that a doubling of traffic levels will produce a three decibel increase in noise level which is considered to be the minimum perceptible change in disturbance. As demonstrated in Table 14.9, an increase in traffic of 16.9% is anticipated on Main Street, Ratho. The magnitude of change is considered to be negligible therefore this effect has been determined to be **not significant**.

Visual Impact of Traffic

It is unlikely that traffic associated with the proposed development will result in any perceptible visual impact. Main Street is currently the only route through the village of Ratho and as a result, experiences a high volume of traffic using it on a daily basis. The road is also currently used by residents to park their vehicles therefore it is expected that an increase in traffic will have no discernible visual impact on Main Street and the village of Ratho itself. Additionally, there is not thought to be any sensitive vantage points, such as hillsides, for which an increase in traffic on Main Street would have an adverse impact on.

The magnitude of this effect is therefore considered to be negligible. Due to Main Street's current status as a heavily trafficked road, this effect is considered to be **not significant**.

Severance

According to the IEA Guidelines, severance is "*the perceived division that can occur within a community when it becomes separated by a major traffic artery*" and "*…could equally be applied to residents, motorists or pedestrians*."

An increase in traffic on Main Street caused by the proposed development could potentially make it more difficult for pedestrians to cross the road or for traffic to enter adjoining minor roads. For there to be a perceivable division compared to existing conditions, a significant increase in traffic is required.

It is anticipated that there will be an average increase of 36 vehicles per hour through Ratho as a result of the proposed development. Given that the 2030 baseline traffic volume is expected to amount to 211 per hour (over an 18-hour period), it is expected that there will be a negligible change in conditions. Furthermore, the low speed of vehicles throughout the village – due to speed limits and width restrictions – enables pedestrians and other road users to cross or enter Main Street without a perceptible delay. It is therefore unlikely that pedestrians and road users on Main Street will perceive any severance as a result of traffic related to the proposed development.

This effect is therefore considered to be **not significant**.

Journey Time Increase

An increase in traffic can result in an increase to journey times due to congestion caused by an oversaturated road network. Due to the volume of traffic that is anticipated to use the Main Street, Ratho to access the wider road network 2030, it is expected that journey times on this road would be affected.

Using the junction modelling software 'Junctions 9', the anticipated impact of the proposed development on the Main Street / Dalmahoy Road / School Wynd junction in the village of Ratho was assessed. It was found that in 2030 without the inclusion of traffic from the proposed development, drivers turning right from Dalmahoy Road on to Main Street would experience a maximum delay of 12 seconds. With the inclusion of traffic associated with the proposed development, the delay for turning traffic is expected to rise to 15 seconds.

The magnitude of this effect is considered to be negligible and therefore **not significant**.

Pedestrian Delay, Intimidation and Loss of Amenity

An increase in traffic can make it more difficult for pedestrians to cross a road and increase the perception of intimidation due to the fear associated with crossing or walking alongside a busy road. As mentioned previously, the village of Ratho is anticipated the be the most sensitive towards an increase in traffic impacting pedestrians.

The 20-mph speed limit that is enforced throughout Main Street, Ratho is expected to sufficiently mitigate any increase in traffic related to the proposed development from caused delay or intimidation to pedestrians. Furthermore, the volume of traffic from the proposed development that is anticipated to travel through Ratho on a daily basis is low therefore the magnitude of change is considered to be negligible.

This effect is therefore considered to be **not significant**.

Road Accidents and Safety

Road accidents are attributable to a variety of factors e.g. driver behaviour, weather, road conditions etc. but an increase in traffic in a localised area has the potential to increase the frequency in which accidents occur. Between the 1st January 2013 and 31st December 2017, several road traffic accidents were found to have occurred in and around the village of Ratho.

There were six 'slight' injury accidents on Dalmahoy Road and Main Street in the village of Ratho north of the proposed development. Of the six accidents, two involved vehicles colliding with pedestrians, two were due to vehicles colliding when turning at junctions, one was a head-on collision and the sixth accident was a single-vehicle accident.

Due to the low volume of traffic associated with the proposed development that is anticipated to use these roads, the magnitude of change has been determined to be **low**.

The sensitivity of Main Street, Ratho with respect to road safety has been determined to be medium therefore this effect is considered to be **not significant**.

14.5.4 Summary of Effects

A summary of the effects related to transport for the proposed development and their respective significance is provided below in Table 14.10.

Effect	Significance
Traffic noise and vibration	Not Significant
Visual impact of traffic	Not Significant
Severance	Not Significant
Journey time increase	Not Significant
Pedestrian delay, intimidation and loss of amenity	Not Significant
Road accidents and safety	Not Significant

Table 14.10: Summary of Effects

14.6 Mitigation Measures

It is proposed that all mitigation measures associated with the operation of the proposed development will be embedded into its planning and design. As a result, no further mitigation measures are proposed. For detailed information regarding the planning and design measures that are proposed, refer to the supporting TA.

14.7 Residual Effects

It is anticipated that there will be no perceivable residual environmental effects as a result of residential traffic associated with the proposed development upon completion of construction.

14.8 Cumulative Effects

14.8.1 Cumulative Developments

As mentioned previously, the cumulative impact of allocated developments within the current LDP and cross boundary flows have been assessed by applying NRTF 'high' growth to baseline traffic flows in the Study Area. To provide a robust assessment, the growth has been applied on all road links in the Study Area.

However, it is recognised that there are several additional developments that are currently in the planning process that could result in a negative cumulative impact on the Study Area. The following developments have been assessed to determine their ADF and consequently their impact on the 2030 baseline traffic flow.

- Garden City, Gogar;
- Riccarton Mains Village;
- Newills Road, Balerno; and
- Freelands Farm, Ratho.

The anticipated impact of the proposed development on the 2030 baseline ADF combined with the expected ADF of the aforementioned cumulative developments is shown in Table 14.11.

Count Point	2030 Baseline ADF	Cumulative ADF	Combined ADF	Development ADF	2030 Total ADF	% Impact
1	16,178	85	16,263	664	16,927	4.1%
2	15,401	85	15,486	664	16,150	4.3%
3	4,797	19	4,816	0	4,816	0.0%
4	19,653	85	19,738	664	20,402	3.4%
5	18,680	85	18,765	692	19,457	3.7%
6	2,510	259	2,769	3,814	6,583	137.7%
7	3,798	248	4,046	642	4,688	15.9%
8	20,923	223	21,146	3,122	24,268	14.8%
9	3,314	0	3,314	173	3,487	5.2%
10	19,020	223	19,243	2,949	22,192	15.3%

11	33,639	1,908	35,547	2,949	38,496	8.3%
12	43,670	1,526	45,196	2,020	47,216	4.5%
13	39,163	1,206	40,369	1,788	42,157	4.4%
14	37,166	1,109	38,275	1,652	39,927	4.3%
15	35,153	1,087	36,240	1,615	37,855	4.5%
16	3,238	207	3,445	642	4,087	18.6%
*Count Point 6 is within the proposed development therefore the baseline conditions will change significantly						

Table 14.11: Cumulative Impact

As expected, with an increase in the baseline ADF as a result of cumulative developments, the percentage impact of the proposed development with regards to traffic volume decreases. All road links within the Study Area are expected to have sufficient capacity to accommodate the anticipated increase in traffic as a result of the proposed development and cumulative developments as per the capacities listed in Table 14.6.

14.8.2 Committed Transport Infrastructure Improvements

It is acknowledged that there are several transport infrastructure improvements within the Study Area that are currently in the planning process that aim to improve road safety and journey times and provide sufficient capacity for a future increase in traffic.

One such improvement is the planned upgrade of the A71 / Dalmahoy Road junction immediately south of the proposed development. Current plans show that it is proposed that the priority junction is upgraded to a signalised junction with dedicated phases for pedestrians and turning traffic. It is anticipated that the presence of this junction will improve safety and accessibility for residents of the proposed development and existing road users on the A71.

The proposed development is located within the Calder and Hermiston Transport Contribution Zone which requires developer contributions for infrastructure improvements to the A720 / A71 Calder Road roundabout and the M8 / A720 / Hermiston Gait roundabout. Although details of the planned improvements are not currently available, it is expected that improvements to the roundabouts will improve traffic flow and increase capacity.

The proposed development also lies within the Hermiston Park and Ride Transport Contribution Zone which requires £1,000 per unit from developers to fund the planned expansion of the park and ride. Approval for the expansion was approved in July 2012 but details of the planned year of construction completion are not currently known. Although it is anticipated that residents of the proposed development will use public transport to access the park and ride and therefore not make use of the planned expansion in vehicle parking, it is acknowledged that the increase in capacity may lead to a significant increase in bus services at the park and ride.

14.9 Summary

The traffic impact of the proposed development has been assessed. A total of 1,200 dwellings are anticipated to be constructed by the final year of construction in 2030 and so this assessment has focused on this scenario as it represents the worst-case scenario.

Relevant national, regional and local planning policies and documents in relation to transport and traffic for new developments have been discussed.

The IEA Guidelines have been followed during the assessment process. The Study Network included the A71 east and west of the proposed development and several other roads in the surrounding area. Baseline traffic flows were obtained by deploying ATC surveys to record traffic volumes over a seven-day period. The ADF of the proposed development was then added to the baseline in relation to the anticipated traffic distribution in order to assess the traffic impact.

The predicted increase in traffic flows show a negligible impact to the Study Network with a maximum increase of 19.8% on Harvest Road north of the village of Ratho. A maximum increase of 15.5% is anticipated on the A71.

An assessment of the effect of cumulative developments was also carried out and it was found that the Study Area would have sufficient capacity to accommodate both the proposed development and the developments included in the assessment.

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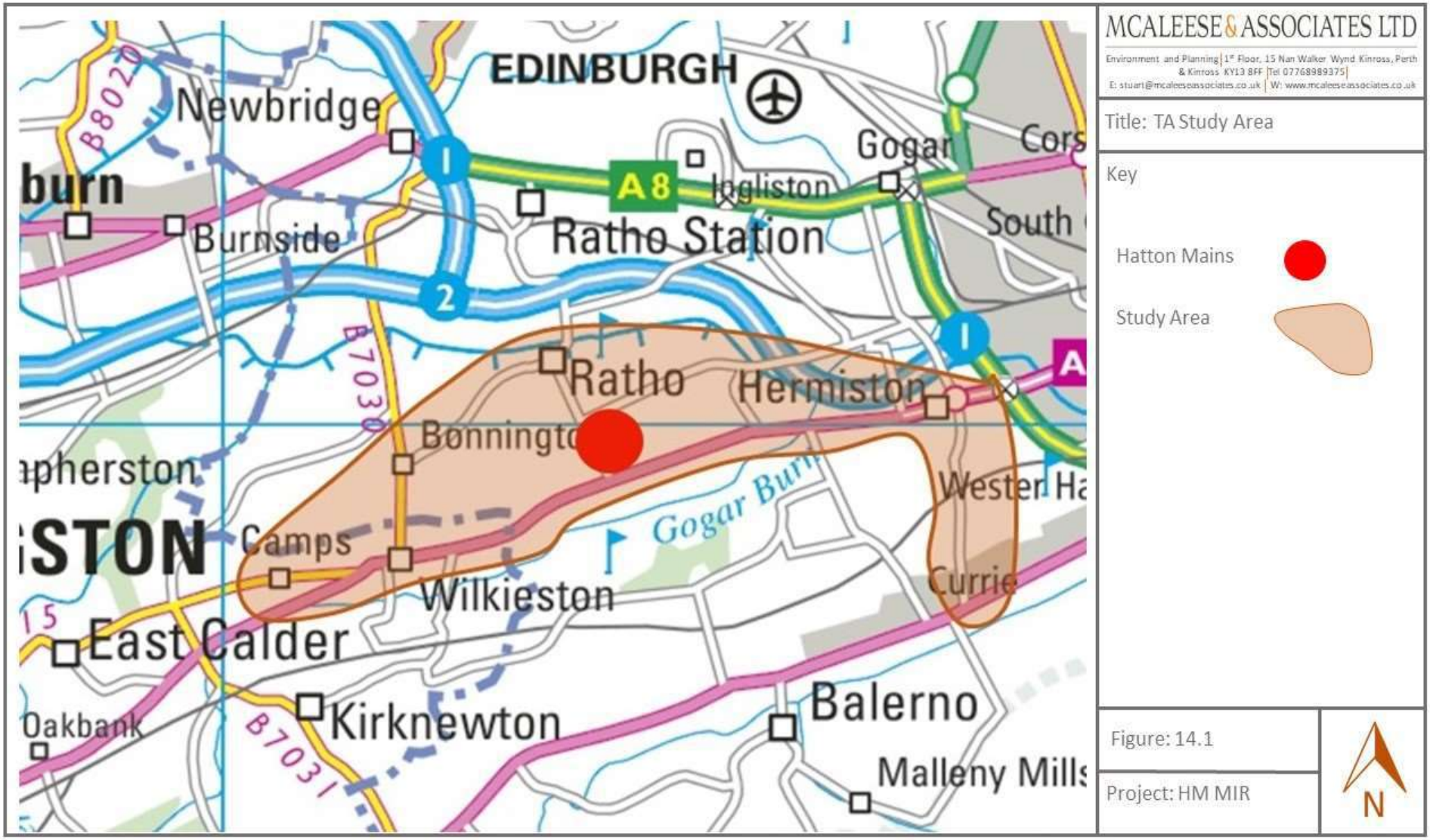
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South
Ratho Station
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Bonnington
apherston
STON
Camps
Gogar Burn
Wester Ha
Wilkieston
Currie
East Calder
Oakbank
B7031
Kirknewton
Balerno
Malleny Mills
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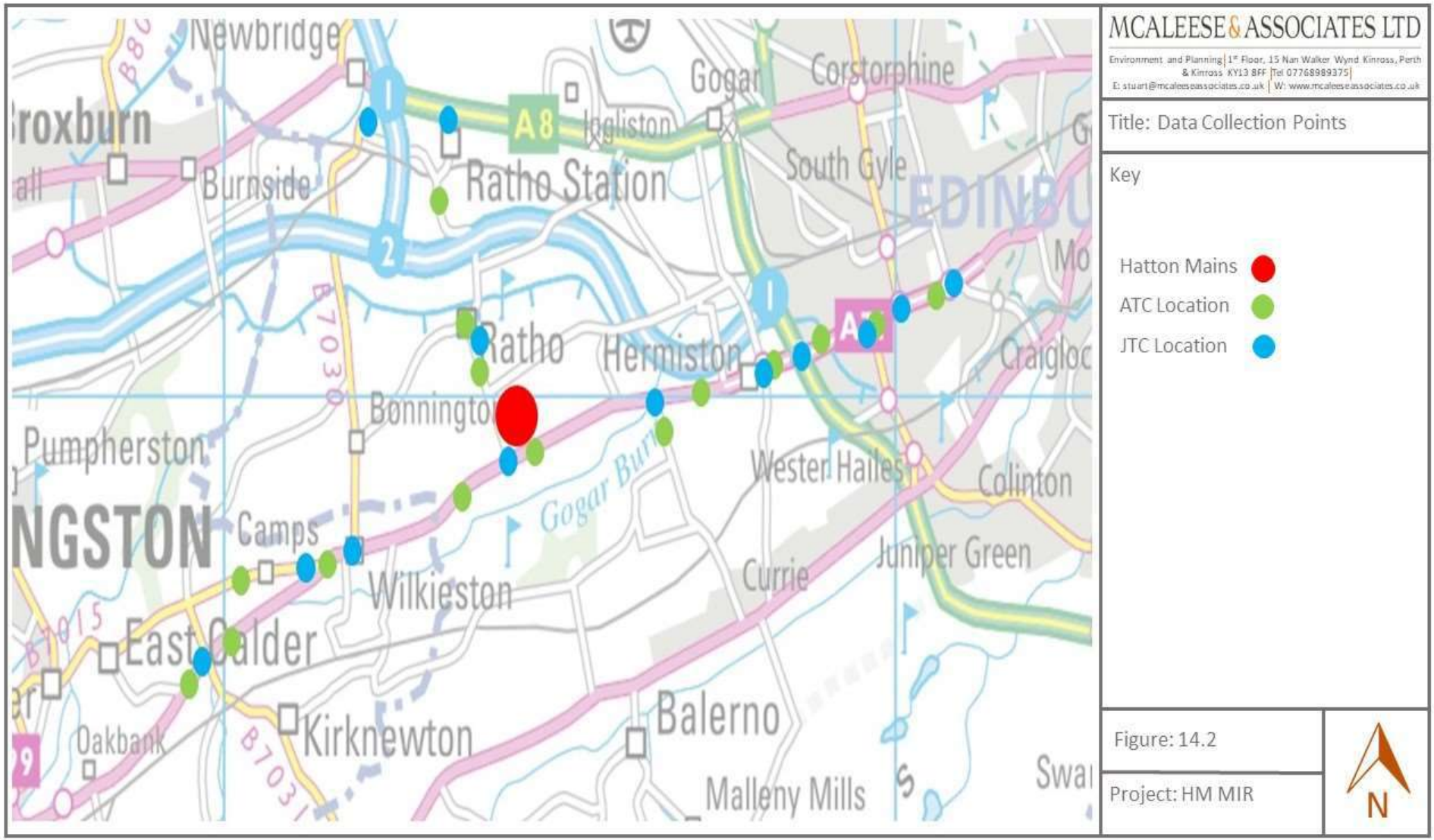
Newbridge
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Ingliston
Gogar
Corstorphine
South Gyle
A8
A71
Ratho
Hermiston
Craigloc
Bonnington
Pumpherston
Gogar Burn
Wester Hailes
Colinton
Juniper Green
Currie
Camps
Wilkieston
East Calder
Kirknewton
Balerno
Malleny Mills
Oakbank
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15

Chapter 15

Landscape and Visual Impacts

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Chapter 15 Landscape and Visual Impact Assessment

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15 Landscape and Visual Impact Assessment

15.1 Introduction

15.1.1 Introduction

This chapter describes the potential effects of the proposed Hatton Village development on the landscape and the visual receptors in the local area. This chapter has been informed by a Landscape and Visual Impact Assessment (LVIA). This is presented in Appendix J.

This chapter has been produced in full recognition of consultee and public input during the consultation procedures, outlined in Chapter 5 (Environmental Assessment) and should be read with reference to Chapter 3 (The Proposed Development) and the Design and Access Statement which accompanies this MIR representation..

15.1.2 Scope of the Assessment

The scope of this report is to describe the proposed development along with the proposed mitigation and appraise the landscape and visual impacts which may arise from the development. Also provided is an overview of planning policy context in terms of landscape matters. A study area of 3 km has been used in accordance with current best practice.

The method used to undertake this assessment is based on the current Guidelines for Landscape and Visual Impact Assessment, Version 3 (produced by the Landscape Institute and the Institute of Environmental Management and Assessment 2013). A full description of methodology is included in Appendix J.

CEC has been consulted on the scope of this assessment. The selection of viewpoints were considered at some length in consultation with CEC (see Viewpoint Selection Table 15.7) and the LVIA methodology is in line with current best practice and guidelines.

Based on the 3 km study area, this assessment identifies the baseline against which the effects of the proposed development are assessed and concentrates on predicting the likely significant effects that might result. Mitigation of the Proposed Development is embedded within the design which includes open green space within the site area and robust landscape infrastructure at boundaries and to accommodate SUDs.

A comprehensive design process was undertaken and the key elements relating to landscape and visual matters are described in the Site Description and Context section of this chapter. The design process led to the built development being set back from the A71 in the western portion of the site and a strong linear park breaking up the proposed built form.

Effects on features identified as important to the landscape quality and on the landscape character of the site and its setting are assessed. Although inter-related, effects on views of the site and its setting and visual amenity are assessed separately.

Landscape effects are on the fabric, character and quality of the landscape and are concerned with:

- Landscape elements (e.g. hedgerows, trees and woodlands);
- Landscape character – regional and local distinctiveness; and
- Special interests (e.g. designations, conservation sites, cultural associations).

Visual effects on people are concerned with the changes in available views through intrusion or obstruction and whether important opportunities to enjoy views may be improved or reduced.

The objectives of the assessment are to:

- Describe and evaluate the landscape resource and visual amenity of the site and the surrounding area which is likely to be affected by the proposed development;
- Identify and assess the significance of any effects on landscape resource or visual amenity associated with the proposed development;
- Identify mitigation measures which could be implemented in order to avoid, reduce, or remedy adverse effects; and

- Describe any enhancements of the landscape resource and visual amenity incorporated into the proposals.

15.2 Legislation and Policy

15.2.1 Introduction

The development plan relevant to this application consists of the *SESPlan Strategic Development Plan* (2013), and the proposed *City of Edinburgh Local Development Plan* (2016). In the context of these plans, the planning policies relevant to the landscape and visual considerations of this application are summarised in the following sections.

15.2.2 SESPlan Strategic Development Plan

The Strategic Development Plan sets out a spatial strategy which recognises existing development commitments and promotes a sustainable pattern of growth. The strategy is supported by a framework for delivery which will promote and secure economic growth and the delivery of housing in the most sustainable locations; and promote the development of strategic transport and infrastructure networks to support that growth and to meet the needs of communities.

The strategic policies most relevant, in terms of landscape, to the proposed development are noted below:

Policy 11: Delivering the Green Network

This policy promotes the creation of green networks which link green spaces and elements to provide a strong green network across the Scottish Borders and Central Scotland. The policy seeks to ensure that:

"The form, function, development and long-term maintenance of the Green Network should be considered as an integral component of plan-making and place-making, and should be incorporated from the outset;

Connectivity across boundaries at a variety of special scales should be secured should be secured: …… between master plans and their surrounding areas; between proposed new strategic development sites and existing communities and neighbourhoods; and between individual site and neighbouring proposed and existing communities;

Major developments in the SESplan area should contribute positively to the creation, maintenance and enhancement of the green network; and

Multi-functional Green Networks should be developed that optimise the potential of components of the network to deliver a range of economic, social and environmental benefits."

Policy 12: Green Belts

This policy is in place for the following purposes:

"Maintain the identity and Edinburgh and Dunfermline and their neighbouring towns, and preventing coalescence, unless otherwise justified by the Local Development Plan strategy;

Direct planned growth to the most appropriate locations and support regeneration;

Maintain the landscape setting of these settlements; and

Provide opportunities for access to open space and the countryside."

15.2.3 City of Edinburgh Local Development Plan (November 2016)

The *City of Edinburgh Local Development Plan* (LDP) provides guidance on the location of development across the rural west of Edinburgh. The LDP sets out planning policies most relevant to the protection of the historic and natural environment which directly influence the landscape and visual matters pertaining to this application. In addition, the Site area is within green Belt. The policies most relevant to this LVIA are listed below.

Policy ENV 3: Listed Buildings - Setting

"Development within the curtilage or affecting the setting of a listed building will be permitted only if not detrimental to the architectural character, appearance or historic interest of the building, or to its setting."

Policy Env 7: Historic Gardens and Designed Landscapes

"Development will only be permitted where there is no detrimental impact on the character or a site recorded in the Inventory of Gardens and Designed Landscapes, adverse effects on its setting or upon component features which contribute to its value. Elsewhere, adverse effects on historic landscape features should be minimised."

Policy Env 9: Development of Sites of Archaeological Significance

This policy notes that in the case of Scheduled Monuments, Historic Environment Scotland is required to be contacted where there is potential for proposed development to affect either the monument or it's setting.

Policy ENV 10: Development in the Green Belt and Countryside

Paragraph 181 of the LDP notes that:

"It is necessary to control the type and scale of development in the green belt to enable it to fulfil its important role in terms of landscape setting and countryside recreation…. However, the purpose of the green belt is not to prevent development from happening…."

Most pertinent to this assessment is paragraph 183 which notes that:

"The key test for all proposals in the green belt and Countryside areas will be to ensure that the development does not detract from the landscape quality and/or rural character of the area."

Policy Env 11: Special Landscape Area

This policy states that:

"Planning Permission will not be granted for development which would have a significant adverse impact on the special character or qualities of the Special Landscape Areas shown on the Proposals Map."

Policy Env 12: Trees

This policy notes that it is not just TPO trees that are protected, and that:

"Development will not be permitted …. …. on any other tree or woodland worthy of retention unless for good arboriculture reasons. Where such permission is granted, replacement planting of appropriate species and numbers will be required to offset the loss to amenity"

15.2.4 Summary of Policy Context

The policies of most relevance to landscape design and assessment are noted above and, placing these in context of the proposed development, these may be summarised as follows:

- Green Belt: since the site is located within green belt the purpose of green belt is considered and the impact of the proposed development on this purpose, in terms of LVIA, is noted in the Landscape Assessment section of this LVIA.
- The scheduled Cup and Ring markings on Tormain Hill should be carefully considered in terms of potential for impact on its setting;
- The existing mature trees within the site area should be carefully integrated into the design; and
- Potential impacts on the setting of the listed buildings around the site area which may be influenced by the proposed development should be carefully assessed.

15.3 Site Context

This section describes the landscape context of the site and also describes important and relevant features within the study area which are pertinent to this assessment of landscape and visual effects.

As illustrated in the Site Location plan (Figure 15.1), the site of the Proposed Development is situated to the south of Ratho and immediately north of the Dalmahoy Hotel and grounds and is largely agricultural in use.

The proposed site is roughly L-shaped, extending from the A71 northwards to the local ridge. The western portion of the site extends over the local ridge to the unnamed water course near Ransfield Cottages. The eastern boundary of the site is bounded by policy woodland associated with the Addistoun Estate, and the western boundary follows the field boundary from Hatton Mains farm in the south to the unnamged water course just south Ratho Mains Cottages.

There are two routes through the site: Dalmahoy Road which runs north/south and a public footpath along the top of the low ridge from Dalmahoy Road to Craw Hill. Dalmahoy Road bisects the site creating an east and a west portion of the site on either side of the road. The western part of the site is further bisected by the footpath from Dalmahoy Road to Craw Hill. The footpath is bounded to the north by a rundown stone wall and mature tree line which forms a distinct feature which would be retained as far as possible. There is also a mature hedgerow lining much of Dalmahoy Road as it moves through the site. As much as possible of this hedge would also be retained within the design layout of the site.

The mixed-use development would consist of areas of housing; a transport hub and community/education centre near the centre of the 'village hub' which would relate directly to the A71. A strong landscape framework, which includes SUDs drainage infrastructure and transportation, as well as strong boundaries and 'linear park' to break up the built form and 'contain' the proposed development. The Landscape Masterplan (Figure 15.2), illustrates the layout of the Proposed Development.

The Landscape Masterplan underwent a comprehensive design process which took account of the following aspirations:

- Creating a sense of place by carefully considering the existing site features and, where possible incorporating these (e.g. the view to the Allermuir in the Pentlands; Arthur's Seat and Edinburgh Castle from key locations in the site and the existing mature hedge and mature trees);
- Ensuring that a network of green spaces connects through the proposed development linking into the existing woodlands, hedgerows and existing waterside vegetation;
- Considering the footpaths and routes used by walkers and incorporating these into the layout (namely the footpath to Craw Hill);
- Considering the drainage needs and accommodating this within a large area dedicated to SUDs in the northern part of the site;
- Allowing for parks and linear parks which link well into and around the built elements of the proposed development, which also serve to fragment the built form in views from outside the site, and
- Considering the greenbelt designation and creating definitive and robust boundaries.

This LVIA is based on the potential impacts resulting from the combination of the elements noted above including the robust boundary planting and vegetation associated with the proposed linear parks which would break up built form and ensure no skylining of buildings.

15.4 Baseline

15.4.1 Introduction

The baseline assessment establishes the existing landscape and visual resource against which the effects of the proposed development are predicted within the 3 km study area (as agreed with the City of Edinburgh Council). It examines the existing landscape elements within the site, and landscape character, value, and susceptibility to change of each landscape receptor within the study area. Visual receptors including settlements, road and rail users, users of recreational routes and their associated susceptibility and value are also identified.

15.4.2 Landscape Baseline

Landscape Designations

The study area includes a number of national and local designations which include Special Landscape Areas (SLA), Garden Designed Landscape (GDL), Listed Buildings, and Scheduled Ancient Monuments. The landscape designations are illustrated in the Landscape Designations plan (Figure 15.3). The Scheduled Monuments and Listed Buildings are illustrated on the Historic Designations plan (Figure 15.4). The key features associated with each designation are described in the succeeding tables.

National Designations

There are two Garden and Designed Landscapes (GDL) which fall within the study area, and several listed buildings and scheduled monuments. The general amenity of the setting of listed buildings and scheduled monuments requires to be assessed within the landscape assessment.

Gardens and Designed Landscapes (GDL)

The Hatton House GDL is situated to the south-west of the site, and the Milburn Tower GDL is located 3 km north-east of the site, on the edge of the study area. The potential for impacts arising from the proposed development on the Milburn Tower GDL is minimal given the distance and intervening tree belts and infrastructure. Therefore, the Milburn Tower GDL is not assessed further in this report. The following table documents the reasons for listing, distance and susceptibility and value allocated to the Hatton House GDL.

GDL	Description	Distance to site (approx.)	Susceptibility & Value
Hatton House	The GDL is considered to be of 'outstanding' value in the Historical, Archaeological and Architectural categories. In respect of Artistic Interest, Scenic and Nature Conservation categories this GDL has 'some' value. The GDL is the remains of late 17th century formal gardens and designed landscape. The designed landscape has steadily been eroded over the last 200 years and much of the GDL is now farmland.	0.25 km	High

Table 15.1: Gardens and Designated Landscapes

Listed Buildings

Listed buildings within the 1 km of the site boundary have been considered since it is highly unlikely that the setting of a listed building would be affected at greater distances.

There are several listed buildings near to the site along the A71 corridor and two listed farmhouses within 1 km of the site. Some of these are within the grounds of the Dalmahoy Hotel that would have no intervisibility with the site and proposed development. The Addistoun Dovecout, an A listed building is also within 1 km but being located within the Addistoun grounds, intervisibility with the site area is prevented by the mature policy woodland. The listed buildings within policy landscapes with no intervisibility with the site area are scoped out of this assessment as there could no conceivable impact.

Figure 15.5 illustrates the listed buildings within the study area, and the following table provides a brief description of the listing, distance and susceptibility and value allocated to the listed buildings within 1 km of the site that are assessed.

Listed Building and Category	Description	Distance to site (approx.)	Susceptibility & Value
C Category 3.5 Dalmahoy St, St Mary's Episcopal Rectory, Church Hall and Rectory Cottage (off A71)	This collection of 3 buildings are single storey and set out in an L-shape configuration. These buildings were designed by John Henderson and are listed for their architectural quality.	At the boundary of the southern edge of the site.	High
B Category Dalmahoy Estate, North Entrance	These listed gatepiers and boundary wall at the northern access of Dalmahoy are thought to be designed by William Adam around 1725.	0.05 km	High
C Category Dalmahoy Estate, North Lodge	This single storey building was designed by Dunn and Findlay and dates back to late 19th century.	0.06 km	High
B Listed Easter Hatton Mains Fairview Cottages and Gates	This is an early 19th century pair of single storey rectangular plan cottages with rubble walls from southern end of the cottages. The wall terminates in a circular ashlar pier with domed cap.	0.1 km	High
C Listed Easter Hatton with Boundary Wall and Gates	This late 19th century 2 storey farmhouse has a rectangular plan with rear projections. The house has numerous architecturally important features and the boundary wall and gate are also listed.	0.12 km	High
A Listed Hatton Estate East Avenue Gates	Dating to 1700 this pair of gatepiers are very ornate with the Lauderdale shield on one pier and the arms of the fifth Earl's Countess on the other.	0.35 km	High
C Listed Ransfield Farm and Gatepiers	This listing is for an early 19th century, 2 storey farmhouse and gatepiers at the southern entrance.	0.30 km	High
B Listed Ratho Mains Farmhouse with Boundary Wall and Steadings	This is an early 19th century 2 storey farmhouse with steading and a listed outer wall.	0.35 km	High

Table 15.2: Listed Buildings

Scheduled Monuments (SM's)

Scheduled Monuments within 1 km of the site area are considered in this assessment as the setting of SMs at a greater distance are unlikely to be influenced by the proposed development. There are two SMs within 1 km of the site (Figure 15.6). These are described in the Table 15.3 below.

Scheduled Monument	Description	Distance to site	Susceptibility & Value
Tormain Hill,cup and ring marked rocks	This is a prehistoric ritual and funerary: cup and ring marks and similar rock art on the summit of Tormain Hill.	0.9 km	High
Union Canal, Foutainbridge to River Avon	This listing includes the entire stretch of the canal including the water and banks of either side, the two path and all distance markers and kicking stones.	1 km	High

Table 15.3: Scheduled Monuments

In addition to the above noted designations, the Ratho Conservation Area falls within the study area. This is scoped out of this LVIA as the southern edge buildings of the village would screen intervisibility.

Local Designations

Special Landscape Areas (SLA's)

There are two SLAs within the study area. The Ratho Hills SLA is immediately west of the proposed site area, and the Gogar SLA is situated around 1.5 km north east of the site as illustrated on Figure 15.3. These areas are described in the following table.

Landscape designation	Description	Distance to site	Susceptibility & Value
Ratho Hills SLA	The Statement of Significance (Review of Local Landscape Designations, City of Edinburgh Council, 2010) notes the following: *"The naturalised corridor of the Union Canal, and the remnant parkland on the slopes in the north of the character area at Ratho Hall and Craig Park, provide a wooded backdrop and enclosure to Ratho village."* *"The distinctive pattern of trees on the ridgeline provides a local landmark."* *"The southern side slopes of the ridge are laid out with woodland blocks and form part of the setting to Hatton House and designed landscape"* *"The ridge-top path running southwards from Ratho to Tormain (147 m AOD) and Craw hill offers extensive, elevated views across a foreground of farmland and woodland towards Arthur's Seat and the city's skyline in the east, the Firth of Forth, Fie and the Cleish Hills and Ochils to the north, the Almond valley to the west and the Pentland Hills in the south."*	0 km	High to Medium (since the designation is local and not national)
Gogar SLA	The Statement of Significance (Review of Local Landscape Designations, City of Edinburgh Council, 2010) notes the special qulaities of which the following is most pertinent to this assessment: *"To the north and east of the cSLA, the grounds of Gogar Mount, Hanley, Gogarburn, Gogar Park and Millburn Tower form a wooded backdrop to the west of the city, coalescing to screen views from the mahor routes of the A8 and city by-pass. This contributes to a sense of separation and contrast between the city, airport and settlements to the west."*	1.25 km	High to Medium

Table 15.4: Special Landscape Areas

Landscape Character Areas

The landscape character of the site and surrounding area was first categorised and defined in the *"Lothians Landscape Assessment"* (SNH 1998) as illustrated in Figure 15.3. More recently in the

local landscape character has been categorised in the *"Edinburgh Landscape Character Assessment"* (published by CEC in 2010) and the "*West Lothian Landscape Character Assessment"* (published by West Lothian Council in 2014) to update the landscape character classification (refer to Figure 15.3). These more recent landscape character assessments have been used to inform the landscape baseline since it is the more recent and up to date document.

The site area falls within the *"Rolling Farmlands"* Landscape Character Type (LCT), and within this larger area, the *"Ratho Farmland"* landscape character area (LCA). This and the other LCAs found within the study area are described in the following table. The text and description are taken directly from the Edinburgh Landscape Character Assessment in order to establish a level of consistency. The baseline landscape character has informed the 'susceptibility and value' rating allocated to each of the landscape character areas.

LCT	Landscape character and features	Susceptibility & Value
Rolling Farmland - Ratho Farmland LCT	The Proposed Development is located within the Ratho Farmland LCA. As the title suggests this LCA is in arable use and it extends over a relatively large area from the hills to the west, Gogarburn to the east, the main railway line to the north and Dalmahoy to the south. The topography is undulating with an overall rise of approximately 40 metres across the area from north to south. The 'Landscape Assessment' section of the description notes the following: • In terms of rarity/uniqueness Ratho farmland does not have any features that are rare or unique within the Lothians or Edinburgh; • In terms of Scenic Quality, the character is described as *"rolling to flat arable fields with hedgerows, policy woodland and tree lines which accentuate the landform. This is a large open landscape with open views".* • The assessment reports that there is no sense of wildness within this LCA due to the proximity of transport routes and urban areas. • Prominence is noted at being Medium due to *"the presence of important transport routes which pass through the area."* • In respect of 'visibility' the assessment notes that *"parts of this landscape are visible from the M8 and local roads"*. (Page 220/221, Edinburgh Landscape Character Assessment, CEC, 2010)	Medium The landscape of this LCA is relatively large in scale and the activity of man is pronounced with active land management ongoing.
Policy landscape-Dalmahoy LCA	The LCA covers the entire Dalmahoy Estate, the majority of which lies south of the A71. Although policy woodland informs the overall character of this area, there are several land uses within the area, including: golf course; modern hotel with car park; and livestock grazing. There are several listed buildings within the Estate including Dalmahoy House which is category B listed; The stable block remains and St Mary's Episcopal Church, also B listed. The landscape itself is a designed landscape though not inventory listed. The 'Landscape Assessment' section of the description notes the following: • In terms of rarity/uniqueness the assessment asserts that *"the component and quality of Dalmahoy do not make it rare or unique within Edinburgh"*. Neither is it considered rare or unique within he wider context of the Lothians. • In terms of Scenic Quality, the character is described as *"policy landscape which has been significantly influenced by development as a country club. The landscape is fragmented and*	Medium This LCT is heavily influenced by existing country club and associated development. It is not considered to be prominent within either Edinburgh or the Lothians.

LCT	Landscape character and features	Susceptibility & Value
	new development features have diminished the integrity of the designed landscape although woodlands, specimen trees and remnant parkland have some scenic qualities." • The assessment concludes that there is *"no sense of wildness"* resulting from the introduction of urban features associated with the country club. • Prominence is noted at being Medium in the 'Summary of Key Characteristics' and the descriptive text notes that *"Dalmahoy is not highly prominent within Edinburgh",* and it is not considered prominent within the Lothians. • In respect of 'visibility' the assessment notes that the *"policy woodlands and policy limit visibility"*. (Page 135/136, Edinburgh Landscape Character Assessment, CEC, 2010)	
Rural Outcrop Hills – Ratho Hills LCA	The LCA is in arable use and extends over a large area from the hills to the west, Gogarburn to the east, the main railway line to the north and Dalmahoy to the south. The topography is undulating with an overall rise of approximately 40 metres across the area from north to south. The 'Landscape Assessment' section of the description notes the following: • In terms of rarity/uniqueness the assessment notes that *"while lacking the iconic form of Arthur's Seat and the rugged qualities of the other outcrop hills, and affected to some extent by quarrying development, the Ratho Hills form an attractive overall landscape composition with well-managed farmland to the east."* The character area is not considered to be rare within the context of the Lothians. • In terms of Scenic Quality, the character is described as *"the distinctive rolling wooded ridge and well-managed farmed slopes of these outcrop hills are of scenic quality.".* • The assessment records wildness quality of the Ratho Hills as None. • Prominence is noted at being High in the 'Summary of Key Characteristics' and the descriptive text acknowledges that *"the Ratho Hills are locally prominent, visible from Ratho village and the Union Canal. They are not readily visible from the urban area of Edinburgh due to their relatively lowly height and intervening woodland and buildings."* • In respect of 'visibility' the assessment notes that the Ratho Hills are *"locally prominent"*. (Page 224/225, Edinburgh Landscape Character Assessment, CEC, 2010)	Medium - High Although this LCA is locally prominent, its influence is limited to the local area.

LCT	Landscape character and features	Susceptibility & Value
Rolling Farmland – Gowanhill Farmland LCA	This LCA covers a relatively narrow corridor of land between the Dalmahoy estate and the settlement of Currie. The western edge of the LCA wraps around the north of Dalmahoy Hill and Kaimes Hill, extending to Kirknewton. This LCA is described as: *"predominantly arable farmland* [which] *has an increasingly fragmented character on the urban fringes of Currie and close to Dalmahoy Hill, where horse paddocks and stables are a feature."* The 'Landscape Assessment' section of the description notes the following: • In terms of rarity/uniqueness Gowanhill farmland LCA is not considered to be rare or unique within the Lothians or Edinburgh; • In terms of Scenic Quality, the area is considered to be of low quality due to *"its fragmented pattern where high voltage power lines, settlement and industry influence character";* • The assessment reports that there is no sense of wildness within this LCA. • Prominence is noted at being Low. • In respect of 'visibility' the assessment notes that the LCA is visible from the settlement of Currie and the railway. (Pages 209/210, Edinburgh Landscape Character Assessment, CEC, 2010)	Medium Despite being compromised in character this area, this LCT provides something of a landscape setting to Currie.
Settled Farmland-Craigpark Farmland and quarries LCA	This LCA comprises the area of land to the north and west of the Ratho Hills which is heavily modified by the activities of man including quarrying, industrial park development and the motorway corridor and junction (M8/M9). The 'Landscape Assessment' section of the description notes the following: • The LCA is considered "only rare within Edinburgh in terms of the degree of modification that has occurred to the landscape by extensive quarrying and built infrastructure". Within the Lothians this type of landscape character is found occasionally on the fringes of large urban areas; • The Scenic Quality of this area is rated as low due to "the fragmented pattern of this area caused by communications and piecemeal industrial development"; • The assessment reports that there is no sense of wildness within this LCA. • Prominence is rated as Medium and described as "not [being] readily visible from surrounding roads (the M8 is aligned in cutting) and retained hill slopes and woodland screen views of quarry voids in many places";	Low This LCT is heavily modified by human activity and characterised by the motorway corridors and junction.

LCT	Landscape character and features	Susceptibility & Value
	• In respect of 'visibility' the assessment notes that this area is "not readily visible from surrounding settlement and roads". (Pages 241/242, Edinburgh Landscape Character Assessment, CEC, 2010)	
Rolling Farmland-Bonnington Farmland LCA	This LCA comprises a gently undulating area of farmland from the River Almond valley in the west to the Ratho Hills to the east, and the M8 corridor in the north to Wilkieston in the south. The 'Landscape Assessment' section of the description notes the following: • The LCA is not considered to rare or uniqueness within the Lothians or Edinburgh; • In terms of Scenic Quality, the area is noted as having *"some limited scenic quality principally associated with the canal and woodlands around Clifton Hall and Bonnington Hall";* • The assessment reports that there is no sense of wildness within this LCA. • Prominence is noted at being Low. • In respect of 'visibility' the assessment notes that *"this area is contained by landform and not widely visible"*. (Pages 203/204, Edinburgh Landscape Character Assessment, CEC, 2010)	Medium Due to the relatively large scale of the landscape and the restricted visibility and prominence.
Lowland River Corridors - Kirknewton Plain LCA	This LCT is characterised by the gently low-lying topography of the plain and the farmland landuse. Of the key characteristics of the LCT noted in the West Lothian Council Landscape Assessment, the following are most relevant for the part of the LCT within the study area: • *"Pylons and overhead electricity lines cut through and intrude into the farmed landscape"* • *"Several minor roads pass north-south through the area linking with the A70 to the south and the A71 to the north"* • *"Structural and formal gardens at Hatton House (partially within West Lothian and included in Historic Scotland's Inventory of Gardens and Designed Landscapes) add to the enclosed, managed character of the area to the north-east of Linburn"*	Medium-High This landscape has mixed scenic value including pylons and a GDL designated landscape.
Settled Farmland-Gogar Farmland	The area of this LCT is defined by the A8, A71 and the City By-pass road corridors. The character in general is informed by the interplay of the wooded policies associated with Gogarburn House; the designed grounds of the Royal Bank of Scotland HQ, and the broad open fields of the Scottish	High Given the small scale of the landscape.

LCT	Landscape character and features	Susceptibility & Value
and Institutions LCA	Agricultural Science Agency (SASA). In addition, a section of the Union Canal is routed through the southern part of this LCA between the M8 and the A71 corridors. The 'Landscape Assessment' section of the description notes the following: • In terms of rarity, the assessment reports that *"While note unique, this landscape is rare within Edinburgh because of its mix of landuses and the intactness of policy woodlands which are important in providing a backdrop to the western outer edge of the city."* This landscape character is not considered to be rare or unique within the Lothians; • The Scenic Quality of this LCT relates to the setting to the institutions provided by the remnants of policy woodland and the new landscape features of the recently designed grounds of the Royal Bank of Scotland HQ, and the *"intimately scaled valley and the wooded grounds of the handsome houses in Gogarbank"*; • The assessment reports that there is no sense of wildness within this LCT. • In terms of Prominence the assessment notes that "*this character area is not readily visible from the city of Edinburgh*"; • In respect of 'visibility' the assessment notes that this area is "*visible from major transport routes*". (Pages 250/251, Edinburgh Landscape Character Assessment, CEC, 2010)	
Settled Farmland-Riccarton Institutional Landscape LCA	This LCA is dominated by the university campus buildings built in 1967. Original features still present include the lime avenue which includes some sycamore trees at the east entrance, and the dense tree belts of mixed species along the boundaries. The LCT is distinct from the surrounding farmland landscape. The 'Landscape Assessment' section of the description notes the following: • In terms of rarity within the Edinburgh area the assessment reports that *"…the landscape is not significantly rare or unique within Edinburgh as there are other examples of more significantly intact policy landscapes and institutional land uses such as Gogar"* Within the wider Lothians area the LCT is not rare; • The Scenic Quality of this LCT is dominated by the university campus and associated infrastructure and there is little evidence of the original policy landscape; • The assessment reports that there is no sense of wildness within this LCA.	Medium Primarily due to the dominance of the university campus buildings and associated infrastructure.

LCT	Landscape character and features	Susceptibility & Value
	• In terms of Prominence the assessment notes that despite the proximity to the A71 and the city bypass the LCT is note prominent within the Edinburgh area due to the "*the relatively shallow landform and perimeter trees*"; • In respect of 'visibility' the woodland belts around the boundaries limit intervisibility with the surrounding landscape. (Pages 262/263, Edinburgh Landscape Character Assessment, CEC, 2010)	
Rural Outcrop Hills- Kaimes and Dalmahoy Hills LCA	Two hills constitute this LCA, namely Kaimes Hill which rises to 259m, and Dalmahoy Hill reaches 246m AOD. Both hills have been quarried and at Kaimes Hill the quarry has been filled by fly tipping. The processing facility for the quarry on Dalmahoy Hill is on the northern slope and can be seen from the A71 and the Edinburgh-Glasgow railway line. The 'Landscape Assessment' section of the description notes the following: • Whilst not rare these hills lie on a locally prominent ridge line which makes them notable especially from the north; • The Scenic Quality of this LCT relates to the *"exposed, elevated peaks located on a ridge, modified by quarrying"*; • The assessment notes the sense of wildness generated by the rugged landform and reinforced by the proximity to the Pentland Hills. • In terms of Prominence the assessment notes that the hills form "*a landscape feature within from a number of nearby settlements and also the A71*". However, from the Lothians the prominence of these hills is reduced by backdrop of the Pentland Hills; • In respect of 'visibility' the hills are visible from the A71 and rail routes. (Pages 220/221, Edinburgh Landscape Character Assessment, CEC, 2010)	High to Medium The LCT is locally prominent being highly visible within the immediate landscape.
Pentland Flanks- Cockburn Geometric Wooded Farmland LCA	This LCA relates to the regular layout of fields and shelterbelts within the area. Many of the water courses have been modified to follow the geometric field boundaries. The farmland is a mixture of arable and pasture, and the some of the tree belts are in decline. The shelterbelt pattern of this LCA is extended northwards where a number of 19th century villas in Balerno have with policy woodland reflecting the geometric field boundaries. The watercourses have been modified to follow field	Medium The LCT is locally important being a relatively rare character type, however, it is a self-contained LCT with little intervisibility with surrounding routes and areas.

LCT	Landscape character and features	Susceptibility & Value
	boundaries which create a strongly geometric pattern and are emphasised by boundary treelines and hedgerows. The 'Landscape Assessment' section of the description notes the following: • In terms of rarity, the assessment reports that in the wider Lothians area there are other examples of this LCT, however, the geometric pattern is particularly strong in the Edinburgh area; • The Scenic Quality of this LCT is characterised by *"gently sloping arable and pasture farmland with strong shelterbelt patterns overlaying the landform with creates enclosure and restricts views"*; • The assessment reports that this LCT is heavily modified by human influences. • In terms of Prominence the assessment notes that the LCT is not prominent within the Edinburgh area. • In respect of 'visibility' *"the landform restricts views from nearby transport corridors*. (Pages 97/98, Edinburgh Landscape Character Assessment, CEC, 2010)	
Pentland Flanks-Leith Plateau Farmland LCA	This LCT relates to the upper reaches of the Water of Leith situated at the foot of the Pentland Hills. The LCT is characterised by a plateau which contains an airfield, and a shallow farmed valley. Within this LCT the Water of Leith is visually insignificant, being a narrow channel of water. The airfield comprises unkempt concrete runways which are overgrown and in need of repair with associated large 'sheds' which form hangars. The farmland is characterised by the gently sloping slopes of the valley which is arable on the lower slopes and pasture on the upper reaches. The 'Landscape Assessment' section of the description notes the following: • Rarity – this LCT is not rare within Edinburgh or the wider Lothians landscape; • Scenic Quality – the rolling farmland affords some scenic qualities; • Wildness – this is a man-modified landscape with little or no wildness. • Prominence – there is intervisibility with the A70. The valley floor is generally not prominent whilst the rising valley slopes provide the foreground to the more prominent Pentland Hills ; • Visibility – the assessment notes that the LCT is visible from the A70. (Pages 103/104, Edinburgh Landscape Character Assessment, CEC, 2010)	Medium The LCT is locally important as the part of the setting to the Pentland Hills. However, the airfield landuse detracts from the scenic quality of the rolling valley slopes of the farmland.

LCT	Landscape character and features	Susceptibility & Value
Lowland Farmland-West Craigs Farmland LCA	This LCT lies west of Edinburgh and is characterised by farmland crossed by major transport routes including the A8 and Edinburgh-Glasgow railway line. To the south the farmland merges with the Ratho Farmland LCT emerging as a less fragmented swathe of farmland. The 'Landscape Assessment' section of the description notes the following: • Rarity – This is not a rare LCT; • Scenic Quality – the LCT is dominated by route corridors which fragment the farmland making for a low overall scenic quality; • Wildness – there is no sense of wildness within this LCA. • Prominence – the LCT is not prominent although it is overlooked by the route corridors; • Visibility – the assessment notes that the LCT is visible from the transport routes. (Pages 92/93, Edinburgh Landscape Character Assessment, CEC, 2010)	Low The LCT is heavily influenced by major route corridors and the airport related infrastructure.
Settled Farmland - Edinburgh Airport LCA	This LCA is dominated by the airport buildings and aeroplanes landing and taking off on a regular basis. The 'Landscape Assessment' section of the description notes the following: • Rarity – the landuse as an international airport is unique within the Edinburgh; • Scenic Quality – of this LCT is dominated by the airport and aeroplane activity consequently has low scenic value; • Wildness – there is no sense of wildness within this LCA. • Prominence – the LCT has prominence due to the activity of aeroplanes which draws attention to the area. • Visibility – the area is low-lying with limited visibility. (Page 229, Edinburgh Landscape Character Assessment, CEC, 2010)	Low The LCT is heavily influenced by the airport buildings, runways and aeroplanes arriving and departing.

Table 15.5: Landscape Character Types

15.4.3 Visual Baseline

Introduction

In order to scope the visual receptors that would potentially be affected by the proposed development, the visual containment of the site has been considered. Desktop research has been undertaken to understand the topography and key features of the site and study area, and field survey work has been undertaken to verify this, establishing areas of potential intervisibility between the site area and visual receptors within the study area. This process has also allowed for 'worst-case' viewpoint locations to be established which have then formed the basis of consultation with City of Edinburgh Council.

Visual Containment

The site straddles the southern section of Dalmahoy Road from its junction with the A71 to the un-named water course some 200m south of Ransfield Cottages rising uphill from approximately 93m above ordinance datum (AOD) at the junction to some 100m AOD at the top of the ridge where the public right of way bisects the western portion of the site area.

The Ratho Hills contain visibility to the west and north-west, and to the north the built form of Ratho contains views northwards within the study area, although there are long distance views to landscape in the far distance. Southwards the site is visually contained by policy woodland associated with Dalmahoy House, although there are longer distance views to the Pentland hills which lie some 5 km south of the site. Eastwards views are contained by the mature policy woodland associated with Addiston House.

Visual receptors are scoped out of this assessment where there would be no views of the proposed development, and viewpoints have been carefully selected to illustrate the extent of potential visibility both in the closer area around the site and from the hills with intervisibility in the distance.

Settlements

There are numerous settlements within the 3 km radius study area as illustrated in the Site Location Plan, Figure 15.1. Of these only Ratho would have potential views of the proposed development. In addition, there are groups of properties with potential for views of the proposed development and these are described below:

Ratho

This village is located in the Rural West Edinburgh area of Edinburgh. It is well connected with easy access to the A8, A71 and the M8 and M9 motorways. The Union Canal passes through Ratho and there is a railway station within the settlement. The village lies just under 1 km north of the site.

Hatton Mains, Easter Hatton and Easter Hatton Mains Cottages (north)

There are two single storey dwellings at Easter Hatton Mains, both of which have a north/south aspect. Easter Hatton is a large detached 2 storey dwelling set behind a dense screen of mature planting. There appears to be two residential properties associated with Hatton Mains: the farmhouse which is a large detached dwelling located west of the sheds and large farm buildings and single storey cottages that may be converted stables face onto the A71.

Easter Gateside

This two-storey detached dwelling faces onto the A71. It is set within grounds that have mature planting along boundaries and immediately north of the dwelling there is a collection of smaller out buildings.

Hatton Mains Cottages (south) and The Elms

This collection of single storey dwellings is situated at the south-western corner of the site area, on the southern side of the A71. The Cottage have an east-west aspect, and the Elms is orientated north/south. All three of the dwellings are on a lower elevation than the A1, set back behind a stone wall and mature tree planting.

Ransfield Cottages

This row single storey row of three cottages have a north-south orientation with front doors and windows looking southwards towards the proposed development, the northern boundary of which would lie some 0.12 km distance from the Cottages.

Ransfield House

Ranfield House is a 2-storey stone built detached building with associated out buildings and sheds situated approximately 0.25 km from the nearest north-eastern boundary of the proposed development. It is unclear if this house is a dwelling or a business premises, however, erring on the side of caution, this assessment follows 'worst-case' protocol and assumes a dwelling status.

Ratho Mains Cottages

There are is a row of 3 or 4 single storey cottages near Ratho Mains Farm situated approximately 0.2 km distance from the north-western boundary of the proposed site. The entrance to these cottages is from the north, and back gardens and south-facing windows would have views of the proposed development.

Ratho Mains Farmhouse

This 2-storey stone-built dwelling has a southerly aspect. It is situated some 0.5 km from the north-western boundary of the proposed site.

Residential receptors are assessed as having a high susceptibility and value.

Road, Rail, and Recreational Routes

Within the study area, there is a network of main, local, and minor routes, and number of recreational routes. However, only those routes with views of the proposed development would be assessed. Given the extent of visual containment of the proposed development, as described above, it is considered that the potential for visual impact would be limited to the routes noted in the following table below. These are shown in Figure 15.7.

Core Paths have been scoped out of this assessment since there are none within 1 km of the site.

The Susceptibility and value of routes is based on the following factors:

- Purpose of the route – e.g. if the route is primarily to appreciate the scenic quality the susceptibility would be rated as High; and
- The speed of travel – the higher the speed at which users may pass through the landscape the lower the susceptibility to development is considered to be.

Route	Distance from site (km)	Susceptibility & Value
Roads		
Dalmahoy Road	0 km	Medium
A71	0.01 km	Medium
Local road accessing Ransfield Cottages	0.12 km	Medium
Local road accessing Ratho Mains Cottages	0.2 km	Medium
Wilkieston Road, Ratho	0.95 km	Medium
Public Footpaths		
PF from Dalmahoy Road to Craw Hill	0 km	High

Table 15.6: Road, Rail and Recreational Routes

15.4.4 Viewpoints

After consultations with City of Edinburgh Council (15.1.2 above), 16 viewpoints have been identified as being representative of key landscape and visual receptors within the study area. These are illustrated on the Viewpoint Location Plan (Figure 15.6) and listed below:

VP / Type	Distance (km)	Landscape		Visual	
		LCT/Designation	Susceptibility & Value	Receptor	Susceptibility & Value
VP1 South-East of site, A71	0 km	Rolling Farmlands (Ratho Farmlands LCA)	Medium	Local road users	Medium
VP2 Dalmahoy Hotel entrance	0.05 km	Policy Landscape (Dalmahoy LCA)	High/Medium	Road users	Medium
		Listed Gates	High	Local road users	Medium
VP3 Ransfield Cottages	0.12 km	Rolling Farmlands (Ratho Farmlands LCA)	Medium	Local road users	Medium
				Local residents	High
VP4 Ransfield House	0.35 km	Rolling Farmlands (Ratho Farmlands LCA)	Medium	Local residents	High
		B Listed Building	High		
VP5 Ratho Mains Cottages	025 km	Rolling Farmlands (Ratho Farmlands LCA)	Medium	Local road users	Medium
				Local residents	High
VP6 Dalmahoy Road, Ratho	0.7 km	Rolling Farmlands (Ratho Farmlands LCA)	Medium	Local road users	Medium
				Settlement	High
VP7 Hatton House	0.7 km	GDL	High	Walkers	High
		SLA	High-Medium		

VP / Type	Distance (km)	Landscape		Visual	
		LCT/Designation	Susceptibility & Value	Receptor	Susceptibility & Value
		Rolling Farmlands (Ratho Farmlands LCA)	Medium		
VP8 Wilkieston Road, Ratho	1 km	Rural Outcrop Hills (Ratho Hills LCA)	High/Medium	Local road users	Medium
		SLA	High/Medium	Settlement	High
VP9 Union Canal Tow Path	1 km	Rolling Farmlands (Ratho Farmlands LCA)	Medium	Recreational users of the canal and tow path	High
VP10 Gogarmuir Road Bridge	1 km	Rolling Farmlands (Ratho Farmlands LCA)	Medium	Local road users	Medium
VP11 Tormain Hill	1 km	SLA	High	Walkers	High
		SM (visual amenity of visitors)	High		
		Rural Outcrop Hills (Ratho Hills LCA)	High/Medium		
VP12 Craw Hill	1 km	SLA	High	Walkers	High
		Rural Outcrop Hills (Ratho Hills LCA)	High-Medium		
VP13 Dalmahoy Hill	2.2 km	Rural Outcrop Hills (Kaimes and Dalmahoy Hill LCT)	High-Medium	Walkers	High
VP14 Warklaw Hill	5.3 km	-	-	Visual amenity of walkers from summit	High
VP15 Allermuir, Pentland Hills	8.4 km	-	-	Visual amenity of walkers from summit	High
VP16 Arthur's Seat	Over 13 km	-	-	Visual amenity of walkers from summit	High

Table 15.7: Viewpoints

15.5 Landscape and Visual Assessment

15.5.1 Introduction

This section addresses the likely effects of the proposed mixed use development on the landscape and visual resources within the study area as outlined in the baseline above. The methodology used to make this assessment is described in Appendix 1, and effects are considered to be adverse unless otherwise noted. The findings of this assessment are set out as follows:

- Pattern of Likely Visibility: an overview of the pattern of the worst-case potential visibility of the proposed development.
- Viewpoint Assessment: a detailed assessment of the landscape change and visual effects predicted from the selection of representative viewpoints. This notes the receptors at each of the representative viewpoints.
- Landscape Effects: an assessment of effects predicted on the landscape resource and landscape character types, and the designated areas.
- Visual Effects: an assessment of effects predicted on the views of people, and whether important opportunities to enjoy views may be improved or reduced.

15.5.2 Pattern of likely visibility

Analysis of the visual containment of the site, as undertaken in the Visual Baseline, shows that close range visibility of the site and proposed development would be limited to an area of approximately 1 km to the west and north by the Ratho Hills and the topography (combined with built form of Ratho) respectively . To the south visibility of the proposed development would be limited by the policy woodland (Dalmahoy) and eastwards mature policy woodland (Addiston) contains views.

Beyond this localised area, there is intervisibility with summits of some of the Pentland Hills and with Arthur's Seat in Edinburgh.

The representative viewpoints illustrate the intervisibility of all the key receptors within areas of predicted intervisibility.

15.5.3 Viewpoint Assessment

The following section provides an assessment of the static landscape and visual effects predicted at the 16 representative viewpoints. Photographs from representative viewpoints (Appendix J, Figures 9 to 24) indicate the extent of the development that is likely to be visible. Mitigation planting is not illustrated but is described in the text.

The viewpoints have been chosen, in consultation with CEC, to depict a 'worst case scenario' of landscape and visual effects regarding the proposed development, and where there is no clear view of the site the viewpoints have been retained to show context and the limited nature of any effect.

Viewpoint 1	**South-East of site, A71 (Appendix J, Figure 9)**		
Distance	*0 km*		
Context	Taken from the lay-by at the south-eastern corner of the site looking over the site area with Ratho hills on the horizon containing the views.		
LANDSCAPE EFFECTS *(refer to Appendix J for method of assessment)*			
LCA	*Susceptibility & Value*	*Level of Change*	*Local effects*
Rolling Farmlands – Ratho Farmlands LCA	Medium	*High:* The proposed development would change the defining experience of the landscape from this viewpoint.	**Major** (Significant)
VISUAL EFFECTS *(refer to Appendix J for method of assessment)*			
Receptor	*Susceptibility & Value*	*Level of Change*	*Effect*
Local Road Users	Medium	*Medium/High:* The A71 travels past the site at this location. The foreground of the view will be boundary planting designed to integrate the proposed development with the neighbouring policy woodland and to provide a setting for the residential development. The visualisation demonstrates that there would be large change in the view. However, the scale of the proposed built form would be in keeping with the mature tree planting and in time the proposed mitigation planting at the boundaries of the site would heavily filter the built form of the proposed development.	**Moderate/Major** (Significant)
Viewpoint 2	**Dalmahoy Hotel Entrance (180°) (Appendix J, Figure 10a, 10b)**		
Distance	*0.05 km*		
Context	Taken from the gates at the entrance to the Dalmahoy Hotel on the A71 looking across the road towards the site area. The built form of the proposed development is indicated in mauve. To the west of Dalmahoy Road the proposed built form would be set back from the A71 with a tree-lined landscape buffer that would function as a cycle route and segregated pedestrian footpath. To the east of Dalmahoy Road the built form would be glimpsed beyond the existing Carvery building. The boundary planting would ensure that views to built form would be filtered and glimpsed.		

LANDSCAPE EFFECTS *(refer to Appendix 1 for method of assessment)*			
LCA	*Susceptibility & Value*	*Level of Change*	*Local effects*
Policy Landscape – Dalmahoy LCA	High/Medium	*Low:* The landscape character of this LCA is inward-looking with mature woodland and high walls creating the boundary. Whilst the proposed development would form a distinct feature in the viewpoint (which looks outside of the LCA), it would not impact upon the landscape character of the policy landscape.	**Moderate-Minor** (Not significant)
Dalmahoy Estate, North Entrance B Listed	High	*Low:* The proposed development would not influence the amenity value of the listed gates given the proposed built form would be on the other side of the A71 and glimpsed beyond proposed boundary planting.	**Moderate-Minor** (Not significant)
VISUAL EFFECTS *(refer to Appendix 1 for method of assessment)*			
Receptor	*Susceptibility & Value*	*Level of Change*	*Effect*
Local Road Users	Medium	*Medium*: The proposed built form of the development would be set beyond a landscape buffer which would filter views. The proposed development would introduce evident change into the view at this location, however, the mitigation planting along with the existing group of buildings (including the Carvery and Planet Flower) would intervene and screen/filter views.	**Moderate** (Not significant given the settled nature of the existing view with dwellings set within wooded grounds)
Viewpoint 3	**Ransfield Cottages (180°) (Appendix J, Figure 11a, 11b)**		
Distance	*0.12 km*		
Context	This viewpoint looks northwards from the cottages towards the proposed development. The visualisation illustrates how the proposed open space (SUDs area) would set built development back from the Cottages, and the manner in which local topography would contain the proposed development.		

LANDSCAPE EFFECTS *(refer to Appendix 1 for method of assessment)*			
LCA	*Susceptibility & Value*	*Level of Change*	*Local effects*
Rolling Farmlands – Ratho Farmlands LCA	Medium	*Medium:* The proposed development would introduce built form into the middle-to-background at this location. Although the foreground would remain as rolling farmland, and the proposed boundary planting would enhance existing tree belts and filter the built form. Notably, the proposed built form is set within the lower part of the area leaving intervisibility with the Pentlands and Ratho hills intact.	**Moderate** (Not significant given that the built form relates to the lower land, is set back in the landscape and would be filtered/screened)
VISUAL EFFECTS *(refer to Appendix 1 for method of assessment)*			
Receptor	*Susceptibility & Value*	*Level of Change*	*Effect*
Local Road Users	Medium	*Low:* The change to the view would be perceptible however built form would be filtered and screened in parts, and set back from the viewpoint. The existing open space of the agricultural landscape within the foreground would remain intact, and landmark hills would remain visible and present.	**Minor** (Not Significant)
Settlement	High	*Low:* There would be a distinct change to the view. The built form would be set further away than the southern boundary of the site and mitigation planting along the southern boundary and within the SUDs area would ensure that views to built form are filtered and in the middle distance. The mitigation planting would resemble the woodland planting of the existing policy woodland. The overall change would be an extension of the woodland from the east of the view and some glimpses to more distant built development beyond the boundary planting.	**Moderate/Minor** (Not Significant)
Viewpoint 4	**Ratho Mains House (Appendix J, Figure 12a, 12b)**		
Distance	*0.35 km*		
Context	This viewpoint is located by the listed building looking northwards towards the site and proposed development. The visualisations demonstrates that the mitigation planting along the boundary of the proposed development would mature to filter much of the proposed built form which is located in the background of the view. The visualisation further demonstrates the low-lying nature of the proposed development which would sit below the horizon with the mature planting of the Dalmahoy policy woodland visible beyond the site area and the Pentland Hills on the horizon. The visualisation also illustrates the relationship of the proposed development to the Ratho Hills with built form being buffered and screened/heavily filtered behind proposed boundary structure planting.		
LANDSCAPE EFFECTS *(refer to Appendix 1 for method of assessment)*			

LCA	*Susceptibility & Value*	*Level of Change*	*Local effects*
Rolling Farmlands – Ratho Farmlands LCA	Medium	*Medium/Low:* The proposed development would introduce built form into the background at this location and the fore and middle ground would remain farmland. The mitigation planting along the boundaries of the site would substantiate the existing tree lines and serve to heavily filter views of the built form once mature. The landmark hills would remain visible as would the policy woodland beyond the site area.	**Moderate-Minor** (Not significant)
Listing Building	High	*Negligible* The proposed development would not have any influence on the setting of the listed building as it would be at a distance and filtered by tree planting with the existing farmland in the fore ground and middle ground of the viewpoint.	**Minor-None** (Not significant)
Settlement	High	*Negligible* The proposed development would result in a perceptible change to the view. However, the change would be distant drawing tree planting across the ridge. There may be potential for a few glimpses to the built form of the development beyond the boundary planting.	**Minor-None** (Not significant)
VISUAL EFFECTS *(refer to Appendix 1 for method of assessment)*			
Receptor	*Susceptibility & Value*	*Level of Change*	*Effect*
Local residents	High	*Low*: The magnitude of change would relate to the filtered views of built form in the background. Overall the setting with Pentland Hills and Ratho Hills on the horizon would not change, and the foreground would remain as existing.	**Moderate/ Minor** (Not Significant)
Viewpoint 5	**Ratho Mains Cottages (Appendix J, Figure 13)**		
Distance	*0.19 km*		
Context	This view looks southwards over the proposed development site to the Pentland Hills on the horizon. The visualisation illustrates the fit of the proposed development within the topography from this viewpoint.		
LANDSCAPE EFFECTS *(refer to Appendix 1 for method of assessment)*			
LCA	*Susceptibility & Value*	*Level of Change*	*Local effects*

Rolling Farmlands – Ratho Farmlands LCA	Medium	*Medium:* The proposed development would introduce built form into the middle-to-background at this location. The foreground would remain as existing. The proposed woodland boundary would mitigate the potential impact of the proposed development by strengthening the burnside planning and introducing more woodland into the landscape.	**Moderate** (Not significant since the key elements of the LCA would remain intact)
VISUAL EFFECTS *(refer to Appendix 1 for method of assessment)*			
Receptor	*Susceptibility & Value*	*Level of Change*	*Effect*
Local Road Users	Medium	*Medium/Low* The most apparent change in view would be the evidence of built development in the middle distance in the view. However, the proposed boundary planting would reflect the policy woodland character of the existing tree belts in the area, reducing the overall level of change likely to be experienced.	**Moderate-Minor** (Not significant)
Settlement	High	*Low/Medium* The change to the view of the residents would be the apparent treebelt stretching across the middle ground of the view. Beyond this there would be views to rooftops interspersed by tree planting. The foreground of the view would remain unchanged	**Moderate** (Not significant given that built form would be fragmented and filtered by mitigation planting and it would be beyond the water course)
Viewpoint 6	**Dalmahoy Road, Ratho (Appendix J, Figure 14)**		
Distance	*0.7 km*		
Context	View from the southern edge of Ratho looking south towards the proposed development along the Dalmahoy Road. The visualisation illustrates the extent of the proposed development within the viewpoint. The boundary planting would filter/screen views of the proposed built form which would be backclothed by the Pentland Hills.		
LANDSCAPE EFFECTS *(refer to Appendix 1 for method of assessment)*			
LCA	*Susceptibility & Value*	*Level of Change*	*Local effects*

Rolling Farmlands – Ratho Farmlands LCA	Medium	*Medium/Low:* The proposed development would introduce built form into the middle-to-background at this location. The boundary planting to the proposed development would reflect the treebelts prevalent in the landscape at this location, and this would reduce the overall change to the landscape character. The foreground would remain as existing and the skyline would remain dominated by the Pentland Hills.	**Moderate-Minor** (Not significant)
VISUAL EFFECTS *(refer to Appendix 1 for method of assessment)*			
Receptor	*Susceptibility & Value*	*Level of Change*	*Effect*
Local road users	Medium	*Low* There would be a slight change to the view with a treebelt extending across the ridge with potential for glimpses of built form.	**Minor** (Not significant)
Residents	High	*Low*: There would be a discernible change to the view, however it would be distant and the boundary mitigation planting associated with the proposed development would reflect the characteristics of the policy woodland prevalent at this location. The middle and foreground would remain as existing.	**Moderate /Minor** (Not Significant)
Viewpoint 7	**Hatton House (Appendix J, Figure 15)**		
Distance	*0.7 km*		
Context	This viewpoint looks eastwards form the eastern extent of the Hatton House GDL towards Hatton Mains farm and the policy woodland beyond.		
LANDSCAPE EFFECTS *(refer to Appendix 1 for method of assessment)*			
LCA	*Susceptibility & Value*	*Level of Change*	*Local effects*
Rolling Farmlands – Ratho Farmlands LCA	Medium	*Negligible/None:* The proposed development would be entirely screened by the landform, Hatton Mains farm buildings and mature tree planting associated with the farm. The proposed development would not change the characteristics of the landscape at this vantage point.	**None** (Not significant)
GDL	High	*Negligible/None:* The outlook and setting of the GDL would remain unchanged since the there would be no intervisibility with the proposed development at this location.	**None** (Not significant)

VISUAL EFFECTS *(refer to Appendix 1 for method of assessment)*			
Receptor	*Susceptibility & Value*	*Level of Change*	*Effect*
Walkers	High	*Negligible/None:* The proposed development would not be evident in the view due to the Hatton Mains farm structures and tree planting.	**None** (Not Significant)
Viewpoint 8	**Wilkieston Road, Ratho (Appendix J, Figure 16)**		
Distance	*1 km*		
Context	This view is from the Wilkieston Road by the junction with Hallcroft Park, just as the road enters/leads the village. The proposed development would be nestled in the low part of the landscape with Pentland Hills on the horizon and the rising ground of the Ratho Hills evident in the middle ground.		
LANDSCAPE EFFECTS *(refer to Appendix 1 for method of assessment)*			
LCA	*Susceptibility & Value*	*Level of Change*	*Local effects*
Rural Outcrop Hills - Ratho Hills LCA	High/Medium	*Negligible/None*: The Proposed Development would result in minor change in the low-lying point of the existing landscape of this vantage point. This would not alter the characteristics of the LCA.	**None** (Not Significant)
SLA	High/Medium	*Negligible/None*: The Proposed Development would introduce treeblets with glimpsed visibility to built form within the low-lying part of this vantage point. This would not detract from, nor alter the characteristics of the Ratho Hills SLA.	**None** (Not Significant)
VISUAL EFFECTS *(refer to Appendix 1 for method of assessment)*			
Receptor	*Susceptibility & Value*	*Level of Change*	*Effect*
Local road users	Medium	*Low /Negligible*: The change in the view would be discernible and distant. The proposed tree planting would minimise the level of change and blend the proposed development into the existing policy landscape.	**Minor-None** (Not Significant)

Residents	High	*Low/Negligible:* The change to view likely to be experienced by residents at this viewpoint is slight and distant. The proposed structure planting along boundaries and within the site area would break up the built form to reflect the policy landscape of Dalmahoy and Addiston.	**Minor** (Not Significant)
Viewpoint 9	**Union Canal Tow Path (Appendix J, Figure 17)**		
Distance	*1 km*		
Context	The view is from the tow path of the Union Canal on the eastern edge of Ratho. The visualisation demonstrates that the proposed development would be completely screened by the landform. Therefore there would be no impacts on the Union Canal and **this viewpoint is not assessed further in this LVIA.**		
Viewpoint 10	**Gogarmuir Road Bridge (Appendix J, Figure 18)**		
Distance	*1 km*		
Context	This view is taken from the local road by Gogarmuir Road Bridge. The mature planting of the policy woodlands dominates this viewpoint, with the Ratho Hills curtailing views on the horizon. The visualisation illustrates that the proposed development would be mostly screened by the Addistoun Estate policy woodlands. The small part of the proposed development that would be visible would be heavily filtered/screened by the proposed mitigation planting at the boundaries of the site.		
LANDSCAPE EFFECTS *(refer to Appendix 1 for method of assessment)*			
LCA	*Susceptibility & Value*	*Level of Change*	*Local effects*
Rolling Farmlands – Ratho Farmlands LCA	Medium	*Negligible:* The proposed development would be largely screened by the existing mature woodlands of the policy woodland. in the middle to far distance the small part of the proposed development that would be visible would extend effectively extend the treeline further. The key characteristics of the landscape at this vantage point would be unchanged.	**None** (Not significant)

VISUAL EFFECTS *(refer to Appendix 1 for method of assessment)*			
Receptor	*Susceptibility & Value*	*Level of Change*	*Effect*
Local road users	Medium	*Negligible:* The viewpoint would remain as existing. Whilst the proposed development would change a small part of the view in the distance, this would not be immediately perceptible when travelling at the speed of a car. The proposed mitigation structure planting at the boundaries of the proposed development would effectively screen/heavily filter the built form in this view.	**Minor/None** (Not Significant)
Viewpoint 11	**Tormain Hill Figure (Appendix J, Figure 19)**		
Distance	*1 km*		
Context	This view looks south-eastwards over the low-lying landscape within which the site is located towards Pentland Hills, Braid Hills and Arthur's Seat on the horizon. The visualisations informs the extent of the proposed development, the built form of which would be broken up by structure planting within the layout and strong defensible planting along boundaries.		
LANDSCAPE EFFECTS *(refer to Appendix 1 for method of assessment)*			
LCA	*Susceptibility & Value*	*Level of Change*	*Local effects*
Rural Outcrop Hills – Ratho HIlls LCA	High/Medium	*Low:* The proposed development would be a noticeable feature in the low-lying landscape at the foot of the hill. Built form would be set within and partially screened by the proposed mitigation planting. The key elements of the landscape character at this vantage point would remain intact.	**Moderate-Minor** (Not significant)
VISUAL EFFECTS *(refer to Appendix 1 for method of assessment)*			
Receptor	*Susceptibility & Value*	*Level of Change*	*Effect*
Walkers	High	*Low* Whilst the visual change would be apparent, this would not change the focus of the panoramic view being the hills in the distance. The view over a well-treed low-lying basin would remain low-lying with additional trees and built form broken up by the proposed mitigation planting. The proposed open space within the proposed development and the defensible and robust boundary woodland/tree planting would weaken the legibility of the proposed built form in this view.	**Moderate-Minor** (Not Significant)

Viewpoint 12	**Craw Hill (Appendix J, Figure 20)**		
Distance	1 km		
Context	This view looks eastwards from Craw Hill to Arthur's Seat on the horizon. The panoramic view is a patchwork of agricultural fields and mature swathes of woodland with buildings dotted between. The visualisation illustrates the part of the low-lying area that would be occupied by the proposed development, the built form of which would be broken up by strong boundary woodland planting and internal structure planting.		
LANDSCAPE EFFECTS *(refer to Appendix 1 for method of assessment)*			
LCA	*Susceptibility & Value*	*Level of Change*	*Local effects*
Rural Outcrop Hills – Ratho HIlls LCA	High/Medium	*Low:* The proposed development would be a noticeable feature in the low-lying landscape at the foot of the hill. Built form would be set within and partially screened by the proposed mitigation planting. The key elements of the landscape character at this vantage point would remain intact.	**Moderate-Minor** (Not significant)
VISUAL EFFECTS *(refer to Appendix 1 for method of assessment)*			
Receptor	Susceptibility & Value	Level of Change	Effect
Walkers	High	*Low* Whilst the visual change would be apparent in a relatively small part of the view. The main elements of the view remain unchanged and the focus of the panoramic view is the hills in the distance. The proposed development sits within a well-treed low-lying basin and built form would be broken up by the proposed mitigation planting. The proposed open space within the proposed development and the defensible and robust boundary woodland/tree planting would weaken the legibility of the proposed built form in this view.	**Moderate-Minor** (Not Significant)
Viewpoint 13	**Dalmahoy Hill (Appendix J, Figure 21)**		
Distance	*2.2 km*		
Context	This panoramic view northwards stretches over the policy woodland and farmland to the Firth of Forth and Fife beyond. The proposed development is situated in the low-lying basin by the substantial areas of policy woodland (Dalmahoy and Addistoun). The existing mature woodland combined with the robust structure planting both on the boundaries of the proposed development and internally, would fragment views of built form.		

LANDSCAPE EFFECTS *(refer to Appendix 1 for method of assessment)*			
LCA	*Susceptibility & Value*	*Level of Change*	*Local effects*
Rural Outcrop Hills – Kaimes and Dalmahoy HIll LCA	High/Medium	*Low:* The proposed development would not influence the key landscape characteristics of the landscape character at this vantage point.	**Minor** (Not significant)
VISUAL EFFECTS *(refer to Appendix 1 for method of assessment)*			
Receptor	*Susceptibility & Value*	*Level of Change*	*Effect*
Walkers	High	*Low:* Whilst the visual change discernible but make little difference to the experience of the view.	**Minor** (Not Significant)
Viewpoint 14	**Warklaw Hill (Appendix J, Figure 22)**		
Distance	*5.3 km*		
Context	This viewpoint is taken from a lower peak in the norther foothills of the Pentlands. The panoramic view looks out over farmland and the built form of Balerno and Currie towards the site area which is in the distance. The proposed development would be barely discernible in this view. **NB: Since this viewpoint is outside the 3 km study area only visual amenity of walkers is considered as landscape character would not be impacted.**		
VISUAL EFFECTS *(refer to Appendix 1 for method of assessment)*			
Receptor	*Susceptibility & Value*	*Level of Change*	*Effect*
Walkers	High	*Negligible:* The change to the view would not be apparent given the distance. In addition, the built form of the proposed development would be fragmented by robust mitigation planting which would effectively blend the development into the existing woodland.	**Minor/None** (Not Significant)

Viewpoint 15	**Allermuir, Pentlands (Appendix J, Figure 23)**
Distance	*8.4 km*
Context	This viewpoint is taken from Allermuir, the highest in the Pentlands. At a distance of over 8 km the proposed development would not be discernible within the panoramic view. Therefore there would be no landscape or visual impacts arising so **this viewpoint is not assessed further in this LVIA.**
Viewpoint 16	**Arthur's Seat (Appendix J, Figure 24)**
Distance	*Over 13 km*
Context	At a distance of over 13 km the proposed development would not be discernible within the panoramic view from Arthur's Seat in Edinburgh. Therefore there would be no landscape or visual impacts arising so **this viewpoint is not assessed further in this LVIA.**

Table 15.8: Viewpoint Assessment

15.5.4 Landscape Effects

Direct Landscape Effects

The proposed development would directly alter the physical landscape of the receiving site area where there is built form. The areas of open space within the development would be altered in character only.

Given the size of the proposal the effect on the physical fabric of the landscape of the site is considered to be ***Major*** and **Significant**.

Indirect Landscape Effects

Landscape Designations

The tables below sets out the predicted effects on all designated landscapes within the study area, namely, Gardens and Designed Landscapes; Listed Buildings and Scheduled Monuments. The tables have been used by way of formatting and contain a full explanation of the level of change likely to be experienced and the resulting landscape effect. The table also notes whether the effect is significant or not.

Effects on Gardens and Designed Landscapes

Receptor	*Susceptibility & Value*	Level of Change	Effect
Hatton House GDL	High	*Negligible:* Viewpoint 7 (Appendix J, Figure 15) from the eastern extent of the GDL (i.e. the nearest point to the proposed development) demonstrates that the Hatton Mains farm buildings and planting would prevent intervisibility. Therefore, there can be no impacts on the setting of the GDL	**None** (Not Significant)

Table 15.9: Effects on GDLs

Effects on Listed Buildings

Receptor	*Susceptibility & Value*	Level of Change	Effect
C Category St Mary's Episcopal Rectory, Church Hall and Rectory Cottage (off A71)	High	*Negligible:* The grounds of this collection of buildings is bounded by a tall mature evergreen hedge that prevents intervisibility with the proposed development. In addition, the mitigation strategy ensures that the boundary with this collection of listed buildings would be sensitively planted to further prevent any potential views to dwellings.	**None** (Not Significant)
B Category Dalmahoy Estate, North Entrance	High	*Low/Negligible:* Viewpoint 2 (Appendix J, Figure 10) illustrates that the built development would be set back from the A71. This buffer would be planted with mature trees and contain a footpath and cylceway segregated from the A71. Given the distance and intervening A road, it is considered that the setting of gate piers and boundary wall would not be influenced by the proposed development.	**Minor-None** (Not Significant)
C Category Dalmahoy Estate, North Lodge	High	*Negligible:* This building is situated to the south of the entrance gate and boundary wall and therefore has very limited intervisibility with the development site. Therefore, the setting would not be influenced.	**None** (Not significant)
B Listed Easter Hatton Mains Fairview	High	*Negligible:* These buildings are located on the south site of the A71 diagonally opposite the south-western corner of the development site. Given the	**None** (Not significant)

Cottages and Gates		separation created by the busy trunk road it is considered that the setting of these buildings would not be influenced by the proposed development.	
C Listed Easter Hatton with Boundary Wall and Gates	High	*Negligible:* Intervisibility with the proposed site would be prevented by the intervening buildings and planting associated with Hatton Mains farm. Therefore, the setting of the structures would not be influenced by the proposed development.	**None** (Not significant)
A Listed Hatton Estate East Avenue Gates	High	*Negligible:* The listed structures are at a distance of over 300 m from the proposed development. Hatton Mains farm buildings and mature planting lies between them and the proposed site preventing intervisibility. Therefore the setting of the structures would not be influenced by the proposed development.	**None** (Not significant)
C Listed Ransfield Farm and Gatepiers	High	*Negligible:* The setting of the dwelling and gatepiers is considered to extend to the minor access road at the south of the building. The proposed development would be located across a field at a distance of over 300 m and bounded by robust tree planting. Therefore the listed structures would not be influenced by the proposed development.	**None** (Not significant)
B Listed Ratho Mains Farmhouse with Boundary Wall and Steadings	High	*Negligible:* Viewpoint 4 (Appendix J, Figure 12) illustrates the scale and size of the proposed development at the listed dwelling. This, combined with the mitigation planting along the boundaries of the site would ensure that the setting of the listed structures is not influenced by the proposed development.	**None** (Not significant)

Table 15.10: Effects on Listed Buildings

Effects on the setting of Scheduled Monuments

Receptor	*Susceptibility & Value*	Level of Change	Effect
Tormain Hill,cup and ring marked rocks	High	*Negligible:* Given the distance of 1 km and being at higher elevation than the proposed development, the setting of the cup and ring marked rocks would not be influenced by the proposed development.	**None** (Not Significant)
Union Canal, Foutainbridge to River Avon	High	*Negligible:* Viewpoint 9 (Appendix J, Figure 17) illustrates that the proposed development would be screened by intervening landform.	**None** (Not Significant)

Table 15.11: Effects on Scheduled Monuments

Effects on Landscape Designations

Receptor	*Susceptibility & Value*	Level of Change	Effect
Ratho Hills SLA	High-Medium	*Low/Negligible:* The proposed development would not change the features set out in the Statement of Significance	**Minor/None** (Not Significant)

		(Review of Local Landscape Designations, City of Edinburgh Council, 2010). Furthermore, the proposed development would be in a low-lying basin and contained within a substantial and robust planting structure which would resemble the woodland block of the neighbouring policy woodlands.	
Gogar SLA	High-Medium	*Negligible:* There would be no intervisibility between the SLA and the proposed development, and no change to the features set out in the Statement of Significance (Review of Local Landscape Designations, City of Edinburgh Council, 2010).	**None** (Not Significant)

Table 15.12: Effects on Landscape Designations

Effects on Landscape Character Areas

In order to keep this LVIA focussed on the main issues and potential significant effects, the visual containment analysis is used to scope out those character areas that would not experience intervisibility with the proposed development. LCAs within approximately 1 km of the site are assessed. LCAs within the area that is bounded by the Ratho Hills to the west; Ratho to the north; policy woodland of Addistoun to the east, and Dalmahoy to the south, are described and fully assessed in the following table.

LCAs outwith this area of visual containment would not be influenced by the proposed development as there would be no intervisibility. Elevated areas such as Dalmahoy hill would have views of the proposed development. However, the viewpoint assessment above demonstrates that impacts on landscape character areas from elevated viewpoints would not be significant.

Receptor	*Susceptibility & Value*	Level of Change	Effect
Rolling Farmland – Ratho Farmland LCT	Medium	*High* Locally Within the core of the site area the character of the LCT would be completely replaced by the proposed development. *Medium to Low* at the Boundaries and beyond There is proposed woodland belts at the boundaries of the site the built form of the proposed development would be set back with intervening green space which would mitigate the level of change experienced from the boundaries.	**Major** (Significant) Locally **Minor-None** (Not Significant) Elsewhere
Policy landscape – Dalmahoy LCA	Medium	*Low* Since the wooded nature of the policy landscape contains views and limits intervisibility. The proposed development would not influence the character of this LCA.	**Minor-None** (Not Significant)
Rural Outcrop Hills – Ratho Hills LCA	High/Medium	*Low/Negligible* Although this LCA is locally prominent, it's influence is limited to the local area. This is illustrated in Viewpoints 11 and 12 from Tormain and Craw hills respectively (Appendix J, Figures 19 – 20)	**Minor-None** (Not Significant)

Table 15.13: Effects on Landscape Character Areas

Green Belt Policy

Since the proposed development is located within green belt, the purpose of green belt, as set out in the SESplan is considered.

- The proposed development would not influence the identity of Edinburgh or Dunfermline, neither would it result in coalescence with existing settlement. Therefore the purpose of the green belt to *"maintain the identity and Edinburgh and Dunfermline and their neighbouring towns, and preventing coalescence, unless otherwise justified by the Local Development Plan strategy"* would not be impacted.
- The proposed development is situated next to a well-used transport corridor and near an existing village (Ratho). Therefore, the proposed development is considered to be in an appropriate location in landscape sustainability terms.
- The proposed development would not affect the landscape setting of Edinburgh, Dunfermline or the nearby village of Ratho.
- The proposed development would, most positively *"provide opportunities for access to open space and the countryside."*

For these reasons, in terms of landscape and visual matters the green belt policy relating to the proposed development site is considered to maintain the purpose of the green belt.

Summary Landscape Effects

Overall, no significant effects are predicted on any designated landscapes within the study area. Significant effects are limited to the fabric and character of the receiving landscape.

15.5.5 Visual Effects

Residential dwellings and settlements

The table below provides an assessment of visual effects on the residents of towns and villages within the 3 km study area as identified in the baseline. This has been informed by field survey from those locations that are publicly accessible and further informed by findings of the detailed viewpoint assessment. The method used to undertake this assessment is described in Appendix J.

Settlement	Distance (km, approx.)	Level of Change	Effect
Towns and Villages			
Ratho	0.7 km	*Low/Negligible* The village is located just under 1 km from the southern boundary of the proposed development. Viewpoint 6, (Appendix J, Figure 14) illustrates the type of change that may be experienced by some of the properties on the southern edge of the village. The viewpoint assessment noted the following change to visual amenity at the edge of the settlement: There would be a discernible change to the view, however it would be distant and the boundary mitigation planting associated with the proposed development would reflect the characteristics of the policy woodland prevalent at this location. The middle and foreground would remain as existing. There would be no change to the visual amenity of residents beyond the southern edge of the village. There would be no impact on the remaining residents.	**Moderate/Minor to None** (Not significant)
Groups and individual dwellings			
Easter Mains Cottages (north of A71), Hatton Mains and Easter Hatton	0.02	*Low/Negligible* The Easter Mains Cottages would be closest to the proposed development at around 20m west of the south-western corner of the site. There unlikely to be direct views of the propose development from these properties as the eastern gable nearest the site has no windows. Furthermore, the area immediately east of the dwellings would be landscape buffer housing the segregated footpath and cyclepath and built form would be set back from the A71. The other dwellings would have no views to the proposed development due to the intervening buildings associated with Hatton Mains farm and mature vegetation.	**Minor** (Not significant)
Easter Gateside	0.05	*Negligible* It is unlikely that there would be views from this dwelling to the proposed development given the extent of mature woodland immediately to the south of the property. Views eastwards are filtered/screened by a mature tree line which would be substantiated by further mitigation planting.	**Minor-None** (Not significant)

Settlement	Distance (km, approx.)	Level of Change	Effect
Hatton Mains Cottages (south of A71) and The Elms	0.04	*Low/Negligible* The Elms is a single storey detached dwelling on the south side of the A71. The property is built on a lower elevation to the road, and there is a high stone wall with mature trees along the boundary with the road. This dwelling may experience glimpsed oblique views to the landscape buffer of the proposed development; however it is unlikely that there would be views to built form which would be set further back. Hatton Mains Cottages on the south side of the A71 would have no views to the proposed development as they are located to the west of The Elms and have a east/west orientation.	**Minor-None** (Not significant)
Ransfield Cottages	0.12 km	*Low* Viewpoint 3 (Appendix J, Figure 11) demonstrates the worst-case effect of the proposed development on the residents of Ransfield Cottages, and the viewpoint assessment notes the following change: There would be a distinct change to the view. The built form would be set further away than the southern boundary of the site and mitigation planting along the southern boundary and within the SUDs area would ensure that views to built form are heavily filtered/screened. The mitigation planting would resemble the woodland planting of the existing policy woodland. The overall change would be an extension of the woodland from the east of the view and some glimpses to more distant built development beyond the boundary planting.	**Moderate-Minor** (Not Significant)
Ransfield House	0.3 km	*Low/Negligible:* Views of the proposed development from this property would be of a similar nature to those from Ransfield Cottages only more distant with a greater foreground of existing farmland in the view.	**Minor** (Not Significant)
Ratho Mains Cottages	0.19 km	*Medium/Low* The potential view from these dwellings is illustrated in Viewpoint 5 (Appendix J, Figure 13) and assessed as follows in the viewpoint assessment: The change to the view of the residents would be the apparent treebelt stretching across the middle ground of the view. Beyond this there would be views to rooftops interspersed by tree planting. The foreground of the view would remain unchanged.	**Moderate** (Not significant given that built form would be fragmented and filtered by mitigation planting and it would be beyond the water course)

Settlement	Distance (km, approx.)	Level of Change	Effect
Ratho Mains Farmhouse	0.35 km	*Negligible* The farmhouse is over a third of a kilometre from the proposed site with oblique views towards the northwest corner of the proposed development. Viewpoint 4 illustrates the type of view and the viewpoint table assesses impact on the residential amenity as follows: The proposed development would result in a perceptible change to the view. However, the change would be distant drawing tree planting across the ridge. There may be potential for a few glimpses to the built form of the development beyond the boundary planting.	**Minor** (Not Significant)

Table 15.14: Visual effects on dwellings and settlements

Road, rail and recreational routes

There is no rail route within the study area, and Core Paths have been scoped out of this assessment as there are none within 1 km of the site. Given the likely pattern of visibility of the proposed development, those routes with potential visibility are shown in the following tables:

Roads

The roads with most direct views towards the site area are assessed in the following table:

Route	Distance	Level of Change	Effect
Dalmahoy Road	0.0 km	*High to Medium* within the site area This road runs through the site area providing access to the proposed development. The views along this road are expected to change fundamentally. *Medium/Low* outwith the site area The section of the road between the northern boundary of the site and Ratho would remain as existing. Views along the road when travelling from Ratho to Dalmahoy would be changed with boundary planting extending woodland belt across the ridge and water course. Visual amenity of users of this road would not be changed due to the intervening trees, buildings and topography.	**Major-Moderate** (Significant) Locally **Moderate-Minor** (Not Significant) outwith the site
A71	0 km	*High to Medium* for the length of road alongside site boundary. Viewpoint 1 and 2 (Appendix J, Figures 9 and 10) illustrate the predicted change to visual amenity of this road from the south-east corner of the site and Dalmahoy Road/A71 junction respectively. There would be a fundamental change to the visual amenity of this road as it passes by the development site since the much of the open space would be replaced by the proposed development. Although there would be a landscaped buffer between the road and the built form of the development, the visual amenity of this section of road would be heavily influenced by the proposed development. *Low/Negligible* for A71 east and west of the site Notably, the visual influence of the proposed development is well contained by policy woodland belt to the east, and Hatton Mains farm and associated building and vegetation to the west.	**Major-Moderate** (Significant) For the section of road alongside the northern boundary. **Minor-Negligible** (Not Significant) for remainder of road.
Local road accessing Ransfield Cottages	0.12 km	*Low* Viewpoint 3 (Appendix J, Figure 11) illustrates the worst-case change to the visual amenity. The visual amenity of this road would be altered a little by the introduction of tree planting into the open farmland along the ridge. Beyond the boundary planting there may be the occasional glimpse to the built form. This would impact the section of road between Ransfield House to Ransfield Cottages. East of Ransfield House the impact would diminish.	**Minor** (Not significant)

Route	Distance	Level of Change	Effect
Local road accessing Ratho Mains Cottages	0.19 km	*Medium/Low* Viewpoint 5 (Appendix J, Figure 13) illustrates the typical change likely to be experienced at this receptor. There would be a noticeable change to the view from this this road due to the introduction of substantial tree planting along the water course with glimpses to built form rising up the slope behind this. Views to buildings would be fragmented by mitigation planting, reducing the overall magnitude of change.	**Moderate-Minor** (Not significant)
Wilkieston Road, Ratho	1 km	*Low/Negligible:* Viewpoint 8 (Appendix J, Figure 16) demonstrates the likely change to the view from this road. The change in the view would be discernible and distant. The proposed tree planting would minimise the level of change and blend the proposed development into the existing policy landscape.	**Minor-None** (Not significant)

Table 15.15: Visual effects on roads

Public Footpath

There is a footpath from Dalmahoy Road to Craw Hill which bisects the western portion of the development site. The predicted impacts on this visual receptor are noted as follows:

Route	Distance	Level of Change	Effect
Public Footpath from Dalmahoy Road to Craw Hill	0 km	*Localised High* The first 460 metres approximately of the route (almost 1.5 km in total) from Dalmahoy Road to Craw Hill would pass through the site area. The views along the footpath for this length of the route would alter fundamentally, even though the existing stone wall and line of mature trees which bound the northern side of the route would be retained in the layout design for the proposed development. *Medium/Low for the remainder of the route* Immediately to the west of the site boundary, the visual amenity of the footpath would revert to the existing views of farmland. The boundary planting proposed would ensure that this a sharp transition and in the views when returning from Craw Hill to Dalmahoy, the boundary planting would limit and restrict the impact of the proposed development as far as possible.	**Localised Major** (Significant) **Moderate/Minor** (Not significant for the remainder)

Table 15.16: Visual effects on footpaths

Summary Visual Effects

Significant visual effects are limited to within the site area where the proposed development would bring about a fundamental change in character, and the A71 where it runs alongside the southern boundary of the site. There are no significant effects predicted as a result of the proposed development outside of the site area.

15.6 Cumulative Effects

Given the limited visual influence of the proposed development as noted in the Baseline section, the potential for significant cumulative effects is limited.

There is one comparative development within the study area that may combine with the proposed development to impact on the amenity of the study area. This is the Land East of Milburn Tower (planning application ref. 15/04318/PPP) which is for approximately 1500 housing units within mixed-use development. This is a live planning application which has not yet been determined.

The Land East of Millburn Tower application is located in the north-west of the study area, on the north-west side of the motorway and rail corridors. Given the distance of over 2 km, and the lack of intervisibility, it is concluded that there would be no cumulative effect arising in combination with this development.

15.7 Conclusion

This LVIA has revealed the following points of note in respect of potential landscape and visual effects:

- The site is well-contained within a low-lying landscape that would have limited intervisibility beyond approximately 1 km to the north and west, and is curtailed to the south and east by policy woodland. This limits potential landscape and visual impacts.
- The proposed landscape masterplan ensures that the key features of the site, namely the stone wall and tree-lined public footpath, would be retained, and the and mature hedge planting along Dalmahoy Road would be retained as far as possible. Where this feature is lost, it would be replaced with similar planting.
- Development of the development site would not compromise the purpose of green belt in preventing coalescence and maintaining the setting of settlement. Furthermore, the

boundary planting would be robust and well-defined. This would both protect the surrounding green belt and also feed into the green networks.

There are few receptors of national landscape importance within the study area.

15.8 Summary of Effects

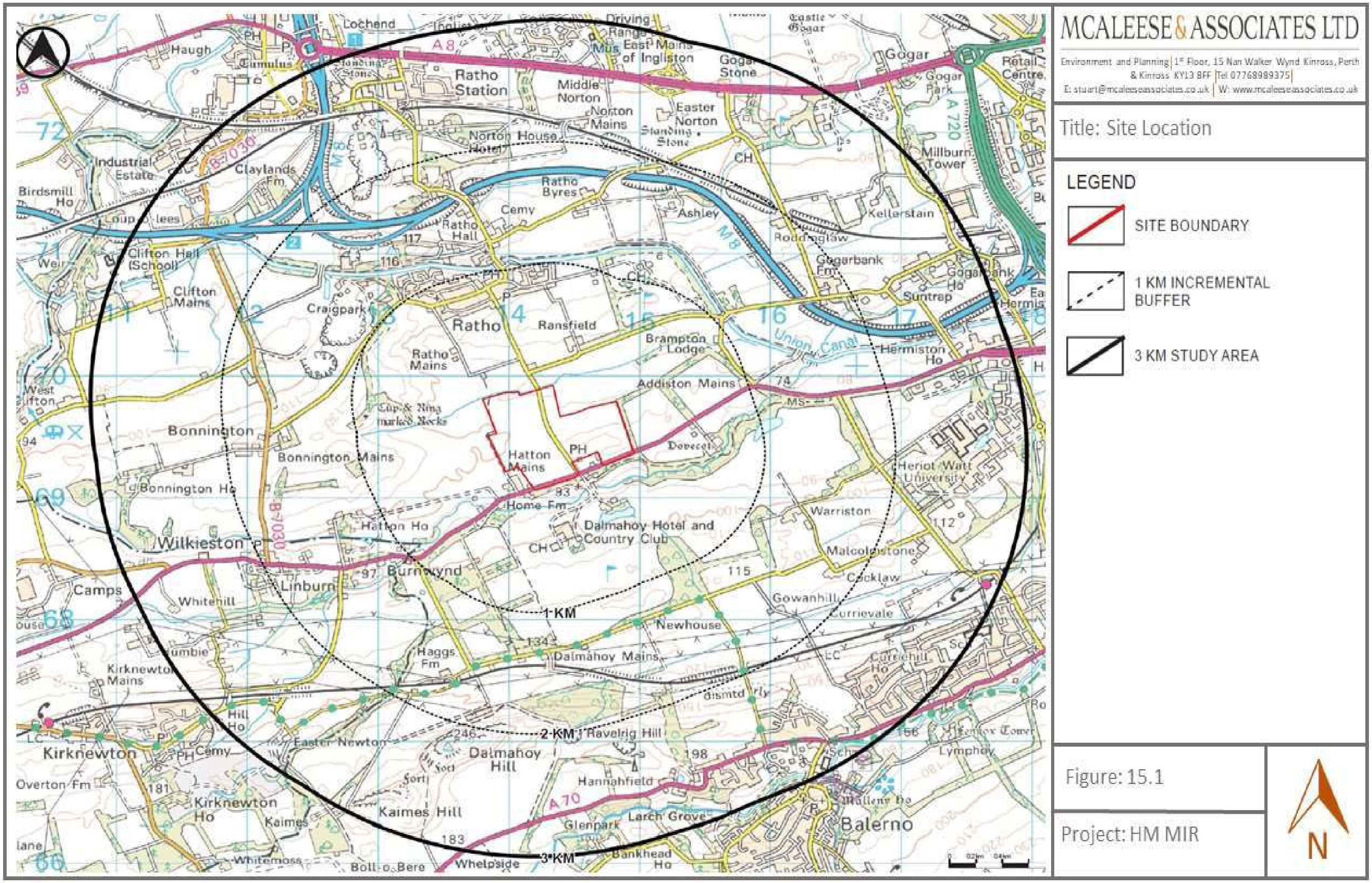
Significant effects are limited to the site area and the southern boundary. These include:

- Significant landscape effects on the fabric of the receiving landscape;
- Significant landscape effects on the character of receiving landscape;
- Significant visual effects on Dalmahoy Road as it passes through the site area;
- Significant visual effect on the pubic footpath where it is within the site area, and
- Significant visual effects on the sections of the A71 where it passes immediately by the proposed development.

Notably, there are no significant effects on receptors outside the site area.

In terms of design and planning policy, it is important to note the that:

- The Cup and Ring markings SM on Tormain Hill has been carefully considered and effects on the setting are not significant;
- The landscape infrastructure as illustrated in the Landscape Masterplan ensures that the riparian environment associated with the unnamed water course at the northern boudnary would be enhanced and utilised to build on creating a sense of place, as would the existing stone wall and associated mature trees by the public footpath;
- The purpose of the green belt designation would not be compromised in terms of landscape and visual matters, and
- The setting of listed buildings around the site, including Dalmahoy Gates, has been carefully considered and the setting of these buildings would be not significantly impacted by the proposed development.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E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
Title: Site Location
LEGEND
SITE BOUNDARY
1 KM INCREMENTAL BUFFER
3 KM STUDY AREA
Figure: 15.1
Project: HM MIR
N
1 KM
2 KM
3 KM
Hatton Mains
Ratho
Ratho Station
Dalmahoy Hotel and Country Club
Addiston Mains
Heriot Watt University
Balerno
Kirknewton
Wilkieston
Gogar
Union Canal
Bonnington
Burnwynd
Linburn
Dalmahoy Hill
Kaimes Hill


BOUNDARY PLANTING ALOWING PARTIAL VIEWS TO EDGE OF DEVELOPMENT FROM THE NORTH
INFORMAL LANDSCAPE WITH FLOOD TOERANT PLANTING
distant view to edinburgh castle
POTENTIAL FOR EXISTING BOUNDARY WALLS, TREES AND MATURE HEDGETO BE INCORPORATED INTO DEVELOPMENT
EXISTING STRUCTURE WOODLAND TO EASTERN BOUNDARY
LINEAR STEET ALIGNED TO EDINBURGH CASTLE
1
castle avenue
distant view to arthur's seat
STRUCTURE WOODLAND PLANTING TO WESTERN BOUNDARY
EXISTING FIELD BOUNDARY
LINEAR PARK
LINES OF TREES CAREFULLY PLANTED TO ENSURE VIEWS RETAINED
4
PARK
ACTIVE PEDESTRIAN / CYCLE LINK ALIGNED TO PEAK OF ALLERMUIR
arthurs seat avenue
pentland walk
LINEAR GREEN STREET ALIGNED TO PEAK OF ARTHURS SEAT
TRANSPORT HUB
COMMUNITY/ EDUCATION (1.45 Ha)
LINEAR PARK ALIGNED TO PEAK OF ARTHURS SEAT
PARK
VILLAGE HUB
distant view to allermuir hill
LINE OF BOUNDARY TREES ALONG A ROAD ALOWING PARTIAL VIEWS TO EDGE OF DEVELOPMENT
OFF ROAD CYCLE ROUTE THROUGH DEVELOPMENT
OPPORTUNITY FOR SOUTH FACING SEATING
HARD LANDSCAPED AREA SURROUNDED BY DENSE HOUSING AT CENTRE OF DEVELOPMENT
LINE OF BOUNDARY TREES ALONG A ROAD ALOWING PARTIAL VIEWS TO EDGE OF DEVELOPMENT
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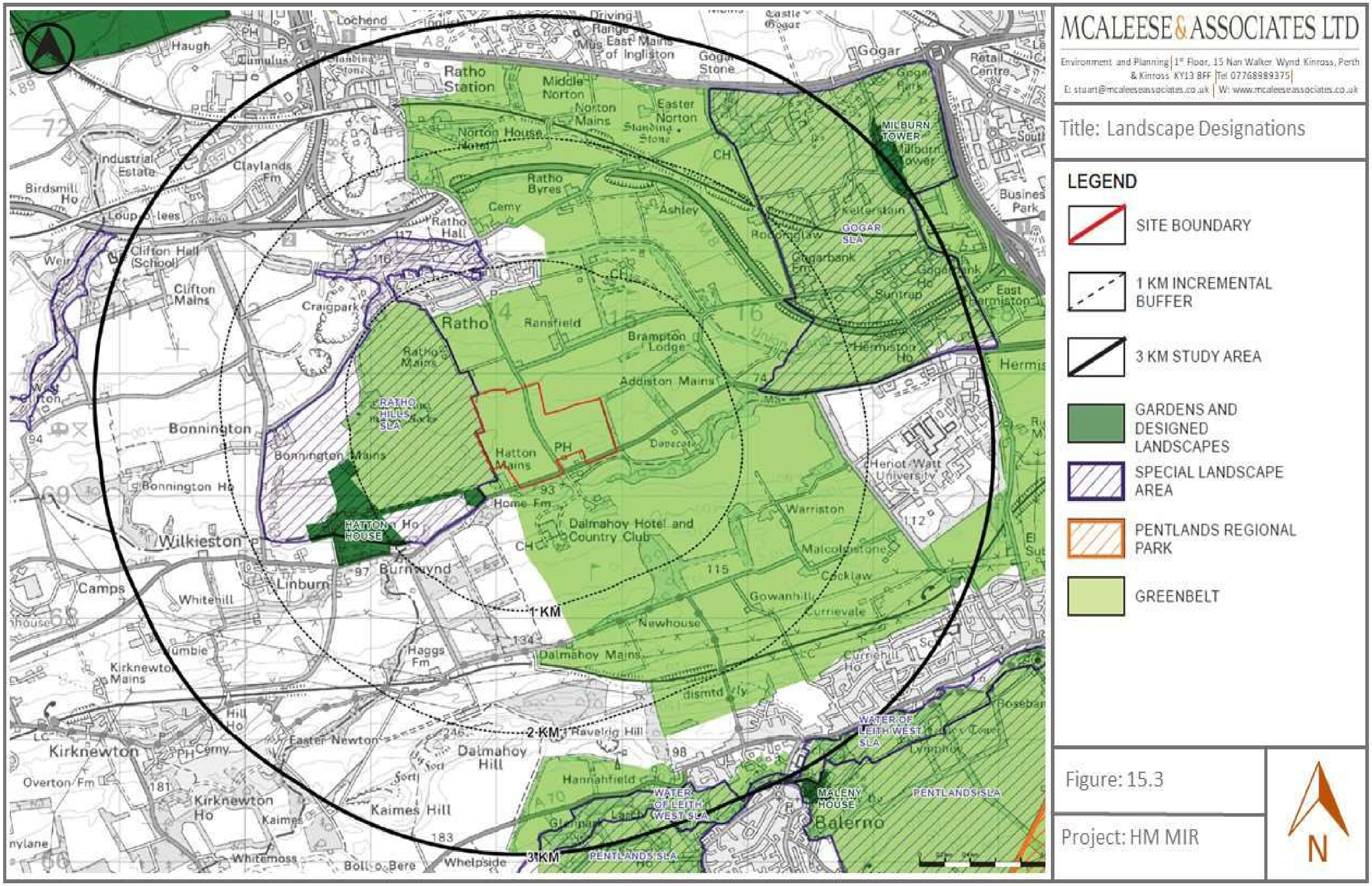
E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
Title: Landscape Masterplan
Figure: 15.2
Project: HM MIR
N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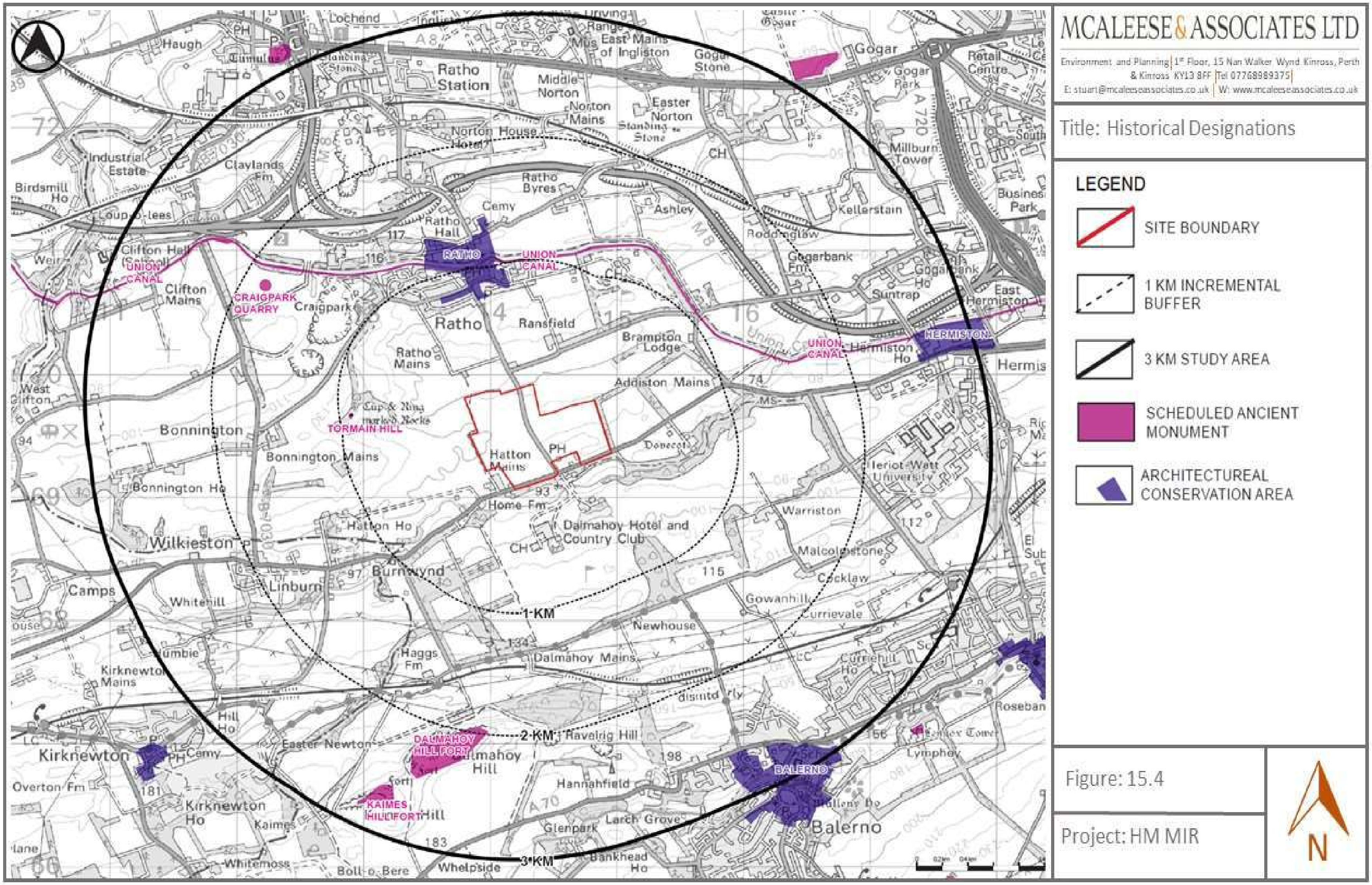
E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
Title: Landscape Designations
LEGEND
SITE BOUNDARY
1 KM INCREMENTAL BUFFER
3 KM STUDY AREA
GARDENS AND DESIGNED LANDSCAPES
SPECIAL LANDSCAPE AREA
PENTLANDS REGIONAL PARK
GREENBELT
Figure: 15.3
Project: HM MIR
N
1 KM
2 KM
3 KM
RATHO HILLS SLA
GOGAR SLA
MILBURN TOWER
HATTON HOUSE
WATER OF LEITH WEST SLA
MALENY HOUSE
PENTLANDS SLA
Hatton Mains
Ratho
Wilkieston
Bonnington
Balerno
Heriot-Watt University
Dalmahoy Hotel and Country Club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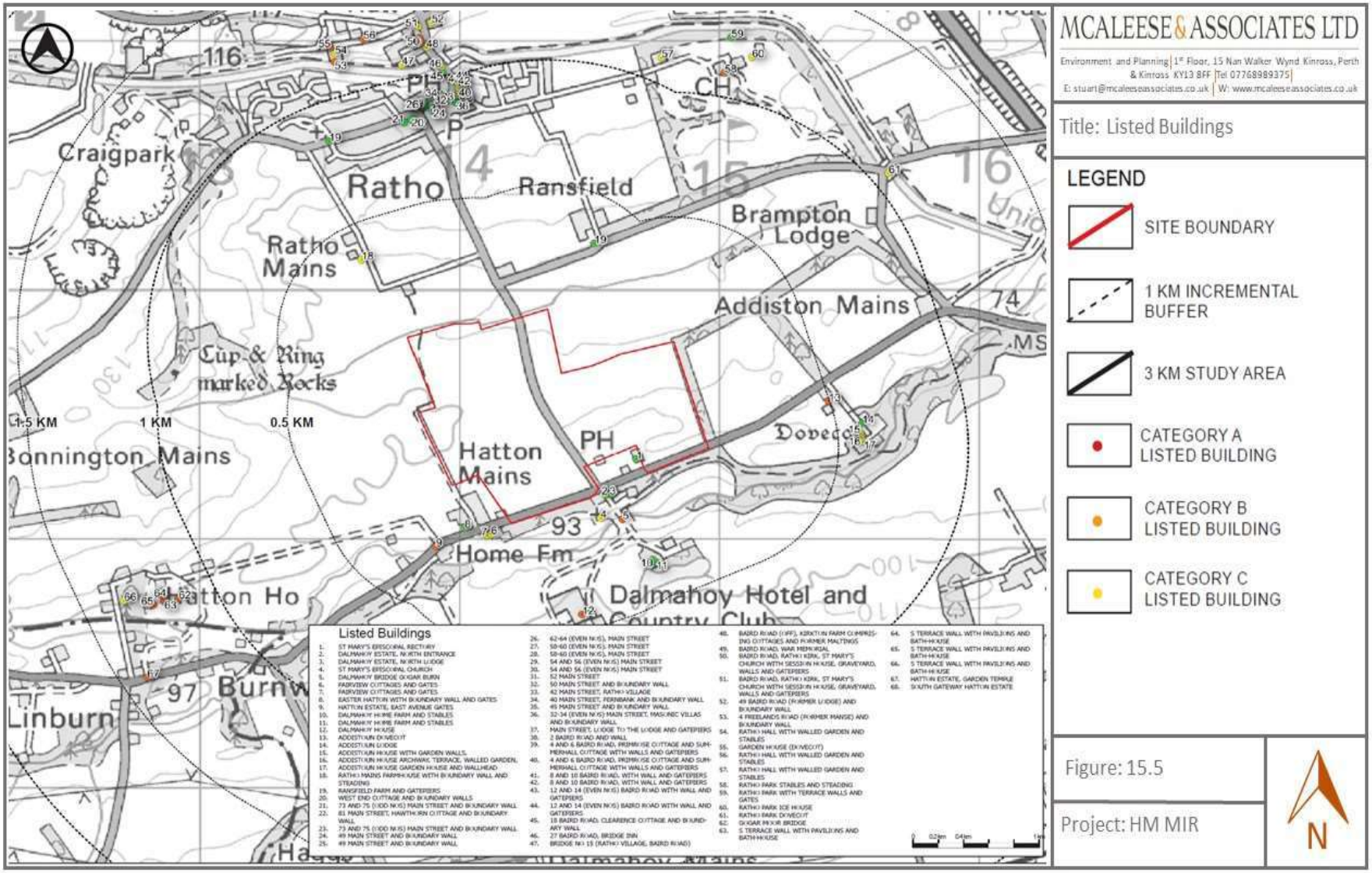
E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
Title: Historical Designations
LEGEND
SITE BOUNDARY
1 KM INCREMENTAL BUFFER
3 KM STUDY AREA
SCHEDULED ANCIENT MONUMENT
ARCHITECTUREAL CONSERVATION AREA
Figure: 15.4
Project: HM MIR
N
RATHO
UNION CANAL
CRAIGPARK QUARRY
TORMAIN HILL
HERMISTON
DALMAHOY HILL FORT
KAIMES HILLFORT
BALERNO
1 KM
2 KM
3 KM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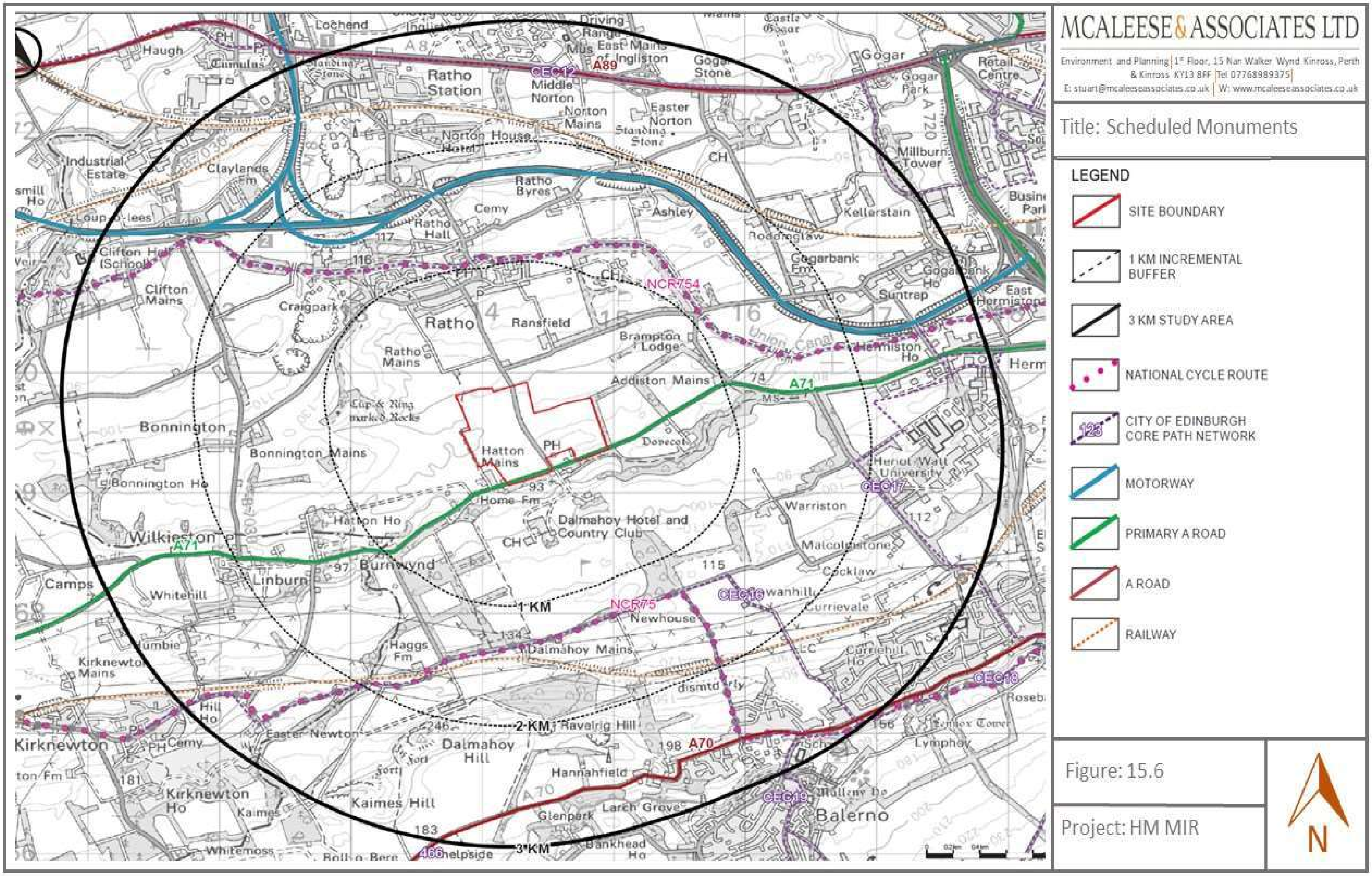
E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
Title: Listed Buildings
LEGEND
SITE BOUNDARY
1 KM INCREMENTAL BUFFER
3 KM STUDY AREA
CATEGORY A LISTED BUILDING
CATEGORY B LISTED BUILDING
CATEGORY C LISTED BUILDING
Figure: 15.5
Project: HM MIR
N
Craigpark
Ratho
Ransfield
Ratho Mains
Brampton Lodge
Addiston Mains
Cup & Ring marked Rocks
1.5 KM
1 KM
0.5 KM
Bonnington Mains
Hatton Mains
PH
Dovecot
Home Fm
Hatton Ho
Dalmahoy Hotel and Country Club
Linburn
Burnw
Listed Buildings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E: stuart@mcaleeseassociates.co.uk | W: www.mcaleeseassociates.co.uk
Title: Scheduled Monuments
LEGEND
SITE BOUNDARY
1 KM INCREMENTAL BUFFER
3 KM STUDY AREA
NATIONAL CYCLE ROUTE
CITY OF EDINBURGH CORE PATH NETWORK
MOTORWAY
PRIMARY A ROAD
A ROAD
RAILWAY
Figure: 15.6
Project: HM MIR
N
1 KM
2 KM
3 KM
Ratho
Ratho Station
Hatton Mains
Dalmahoy Hotel and Country Club
Balerno
Wilkieston
Bonnington
Kirknewton
Gogar
Hermiston
Heriot-Watt University
Burnwynd
Linburn
Addiston Mains
A71
A70
A89
NCR754
NCR75

Chapter 16

Cumulative and Residual Effects

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Chapter 16 Cumulative and Residual Effects

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16 Cumulative and Residual Effects

16.1 Introduction

This chapter documents the residual effects anticipated from the development of Hatton Village. There is also a statement on cumulative effects and the approach taken.

16.2 Statement on Cumulative Effects

Given the nature of the proposed development as a residential development of 1,200 houses, and on review of the overall locational environmental constraints outlined in the technical chapters of this EAR, it is assumed that the main cumulative impacts arising will be associated with traffic and, consequently, noise and air.

As such, and in accordance with the above stated methodological approach adopted for the current assessment, the spatial extent of the consented or planned developments considered for the cumulative impact assessment has been set as those developments consented or allocated within local or strategic plans within an approximate 3km vicinity of the proposal location.

A separate Transport Assessment has been conducted for the proposal that takes into account proposed sites and as such, a cumulative assessment is presented (Chapter 14 and Appendix I).

16.3 Baseline Conditions

The residual impacts identified in each chapter of the EAR is identified in Table 16.1 below.

Topic	Residual Impacts	Significance
Planning Policy	Compliance with the majority of the policies and the most recently published draft Government planning policy documents outweighs any negligible adverse impacts.	Negligible
Socio-Economic	The proposed development will have a beneficial impact upon local employment opportunities, both during the construction period and operational phase.	Minor Beneficial
Cultural Heritage	The proposed programme of archaeological investigations and reporting will offset the predicted direct impacts and any loss of archaeological resource, resulting in minor adverse residual impacts.	Minor Adverse
Biodiversity	Careful design of the drainage system and management of the construction phase will ensure no significant impact. Some habitat loss will occur but this habitat is of site value only.	Minor adverse
Soils and Geology	Given appropriate remediation of potentially contaminated soils and/or groundwater, the residual impact on ground conditions will be local, moderate, long term and beneficial, Loss of prime quality agricultural land does represent a moderate adverse impact, despite it being offset by other beneficial impacts, on the soil and geological resources in this area.	Minor Beneficial Major adverse
Water Resources	Tight control of activities thorough an environmental construction management plan will remove all risks.	Negligible
Air Quality	The residual impact associated with emissions from road and on-site construction vehicles and plant is expected to be negligible, with the exception of construction dust, which is predicted to lead to a minor temporary impact within close vicinity of the site boundary.	Negligible
Noise	Construction traffic will have a negligible impact and building service plant will be designed and installed to have a rating level 10dB(A) below the background noise level. For all assessed roads, the impact from traffic noise will either be negligible or have no effect.	Negligible

Topic	Residual Impacts	Significance
Transport	Construction traffic will be routed directly to the trunk road network via the new routes, thereby avoiding local residential routes, and additional mitigation measures will ensure that this traffic has a minimal impact on the surrounding road network.	Minor Adverse
Landscape & Visual	Landscape effects will be constrained to onsite scale impacts	On site major Significant Adverse Offsite Negligible

Table 0.1: Summary of residual impacts and associated significance

16.4 Mitigation

All mitigation is embedded into the design of the project or is manageable by robust environmental management during construction.

16.4.1 Construction Phase

No residual construction effects are considered to be present following mitigation. The overall construction effect is considered to be **negligible**.

16.4..2 Operational Phase

Once mitigation measures are implemented in relation to ground stability, chemical contamination and gas emissions, residual effects are considered to be **negligible**.

16.5 Conclusions

16.5.1 Statement of Significance for Operations

Pre-mitigation effects of the Proposed Development on environmental resources are considered to be negligible. Hence, with mitigation measures in place there are expected to **no** significant residual effects of the Proposed Development.

16.5.2 Statement of Significance for Cumulative Impacts

Assuming appropriate design and monitoring input has been undertaken for other developments, the cumulative effects on environmental resources is considered to be **negligible**.

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Chapter 17

Summary and Schedule of Commitments

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Chapter 17 Summary and Schedule of Commitments

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17 Summary and Schedule of Commitments

17.1 Introduction

This chapter documents the residual effects anticipated from the development of Hatton Village. There is also a statement on cumulative effects and the approach taken.

17.2 Schedule of Commitments

The schedule of commitments identified in each chapter of the EAR is identified in Table 17.1 below.

Receptor	Impact	Commitment	Implimentation
Local population	Inability of local heath facilities to manage the increase in demand from a new population.	Area within Hatton Village allocated for new health service provision.	Embedded by design.
School population	Schools in the area reaching maximum capacity.	Area within Hatton Village allocated for a single stream Primary School.	Embedded by design.
Undiscovered archaeology in northern fields	Damage to unrecorded archaeological assts	Intrusive site investigation as part of the detailed planning application. Watching brief over the rest of the site during construction.	Planning condition and provision within CEMP.
Habitats	Removal of habitat and impact on wildlife	No vegetation removal in bird breeding season	Planning condition and provision within CEMP.
Bats	Increased lighting	Low level lighting on edges	Embedded by design.
Hydrology and Surface Water	Pollution from vehicle and concrete pollution	Robust environmental management	Planning condition and provision within CEMP.
Residents	Risk from historical contamination	Intrusive site investigation as part of the detailed planning application.	Planning condition and provision within CEMP.
Residents	Risk from agricultural chemical use	Intrusive site investigation as part of the detailed planning application.	Planning condition and provision within CEMP.
Residents and ecological receptors	Dust contamination from construction activities	Site developed form west to east. Dust management measures during construction.	Planning condition and provision within CEMP.
Residents	Daytime and night time construction noise.	Ensure working times are within set times.	Planning condition and provision within CEMP.
Residents	Congestion due to increased operational traffic	Junction and traffic measures as per TA.	Section 75 agreement.

Table 17.1: Summary of residual impacts and associated significance

17.3 Summary

This EAR has assessed the likely significant effects of the proposed Hatton Village development on the environmental receptors on the site and within the local area.

16.4.1 Construction Phase

No residual construction effects are considered to be present following mitigation. The overall construction effect is considered to be **negligible**.

16.4..2 Operational Phase

Once mitigation measures are implemented in relation to ground stability, chemical contamination and gas emissions, residual effects are considered to be **negligible**.