

**DII ROADS NOTES**

**PARKING / TURNING**  
The required vehicle parking and turning areas to be provided with in the curtilage of the site. Provision must be made for vehicles to reverse and exit in forward gear. (Private drive 18 m x 3.2 m. Over 3 bedrooms require 24 m x 3.2 m).

**VISIBILITY SPLAYS**  
Visibility splays must be retained in perpetuity.

**VISIBILITY SPLAYS**  
The area within the visibility splays shall be cleared to provide a level surface no higher than 250mm above the level of the adjoining carriageway and shall be retained and kept clear thereafter.

**POLES/COLUMNS**  
Any pole or column materially affecting visibility must also be removed. A maximum of 1 No. pole or column is acceptable in each visibility splay. The cost of removing columns/poles is borne by the Applicant.

**HEDGES, ETC**  
Any hedges/walls/fences/trees/shrubs (of any height) located in front of the visibility splays shall be removed.

**FENCE/WALL**  
The line of any new fence or wall must be positioned behind the visibility splays. It is recommended that any new trees or shrubs be planted at least 1.0m back from the visibility splays to allow for future growth and some species will require additional set back.

**DRAINAGE**  
Drainage shall be provided where necessary to prevent water from the access flowing onto the public road. Similarly the existing road drainage must be accommodated where appropriate and measures must be taken to prevent road surface water from flowing onto the access.

It is the Applicant's responsibility to ensure that surface water from the roof of the development does not flow onto the public road, including the footway.

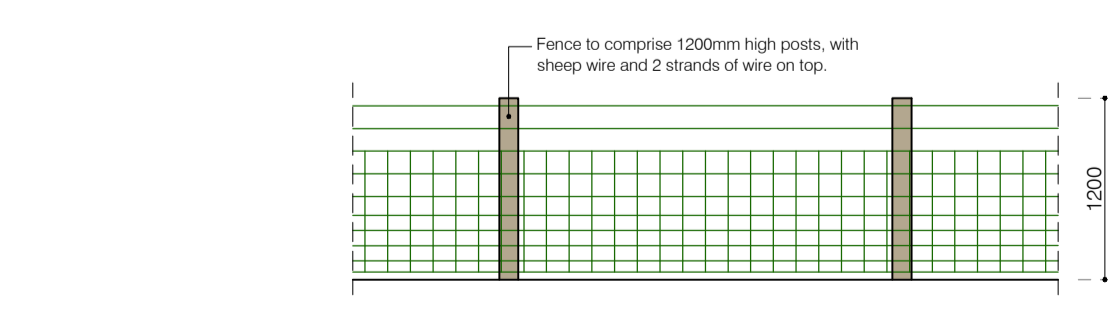
**GRADIENT**  
Gradient of the access shall not exceed 1:12.5 (8%) over the first 5 metres outside the road boundary, i.e. from the back of the verge/ back of footway / fence-line / edge of carriageway. Where vehicular access crosses the footway, the access gradient shall be between 1:25 (4%) maximum and 1:40 (2.5%) minimum and shall be formed so that there is no abrupt change of slope along the footway

**GATES / SECURITY BARRIERS**  
Entrance gates, where erected, should be sited at least 5 metres from the edge of the carriageway. Where this is not possible, they shall be sited so that when open they do not project over the footway, verges, or carriageway.

**DRIVEWAY WIDTH**  
Minimum width 3.2 m. Maximum - 5.0m

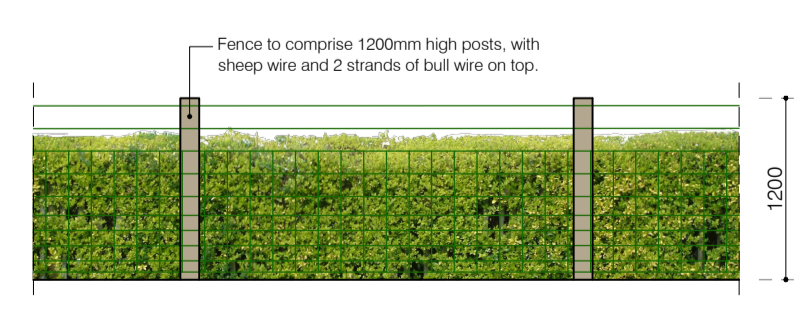
Proposed storm soakaway for access road. Refer to Lisbane Consultants drawing 25-110-B50c for drainage details & levels

Note - area with cross hatching denotes areas that require remedial actions as per GORA & remedial strategy report by RSK Engineering regarding placement of 600mm capping layer to any proposed lawn / garden areas. Areas that require the capping layer are to be dug out / filled in to allow for placement of 600mm deep of suitable materials & top soil to then form finished ground levels.



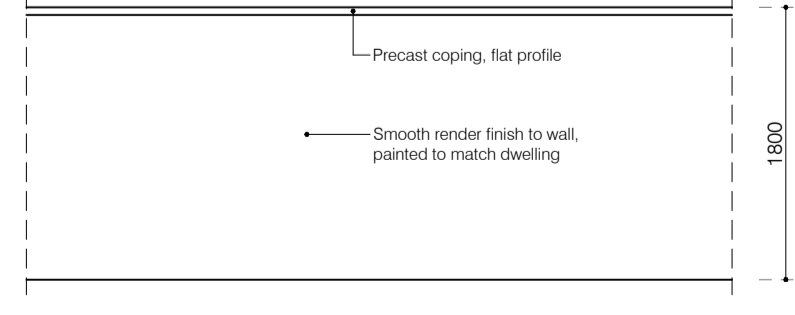
**Proposed Boundary Detail A**  
Post & Wire Fence  
Scale 1:50  
Elevation of post and wire stockproof fencing

Details as annotated and heights as follows:  
• 1.20m high



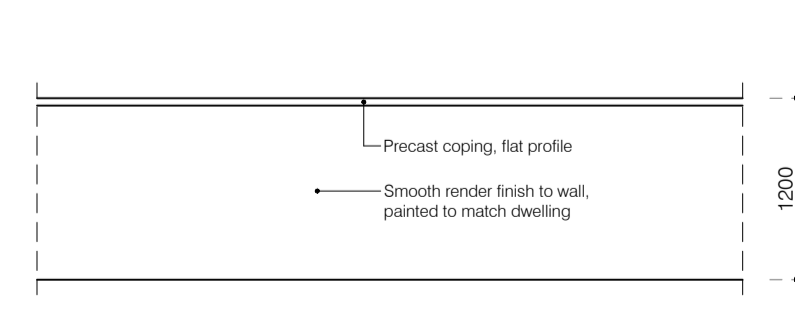
**Proposed Boundary Detail B**  
Post & Wire Fence with Hedgerow Planting  
Scale 1:50  
Elevation of post and wire stockproof fencing with hedgerow planting

Details as annotated and heights as follows:  
• 1.20m high



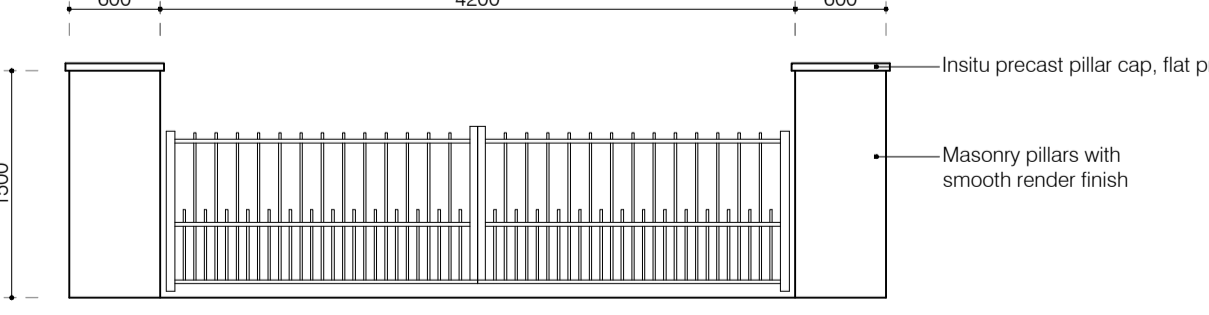
**Proposed Boundary Detail C'**  
Masonry Wall with Coping  
Scale 1:50

Walls:  
1800mm high masonry wall with smooth render finish to wall painted to match dwelling and with flat profile precast coping



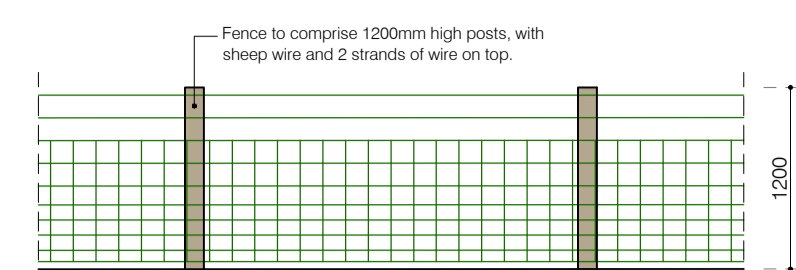
**Proposed Boundary Detail D'**  
Masonry Wall with Coping  
Scale 1:50

Walls:  
1200mm high masonry wall with smooth render finish to wall painted to match dwelling and with flat profile precast coping



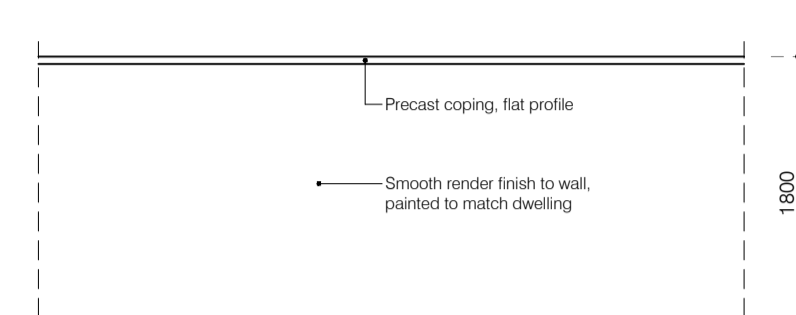
**Proposed Boundary Detail E'**  
Access Gate & Pillars  
Scale 1:50

Gates / Pillars:  
Elevation of galvanised steel gate, colour black, with 1500mm high masonry pillars with smooth render finish painted to match dwelling and with flat profile precast pillar caps



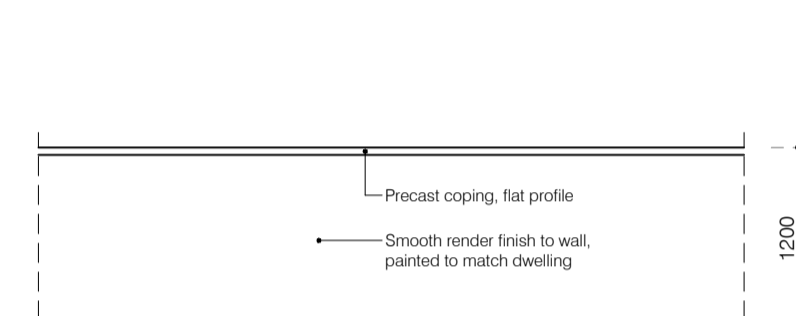
**Existing Boundary Detail A**  
Post & Wire Fence  
Scale 1:50  
Elevation of post and wire stockproof fencing

Details as annotated and heights as follows:  
• 1.20m high



**Existing Boundary Detail B'**  
Masonry Wall with Coping  
Scale 1:50

Walls:  
1800mm high masonry wall with smooth render finish to wall painted to match dwelling and with flat profile precast coping



**Existing Boundary Detail C'**  
Access Gate & Pillars  
Scale 1:50

Walls:  
1200mm high masonry wall with smooth render finish to wall painted to match dwelling and with flat profile precast coping

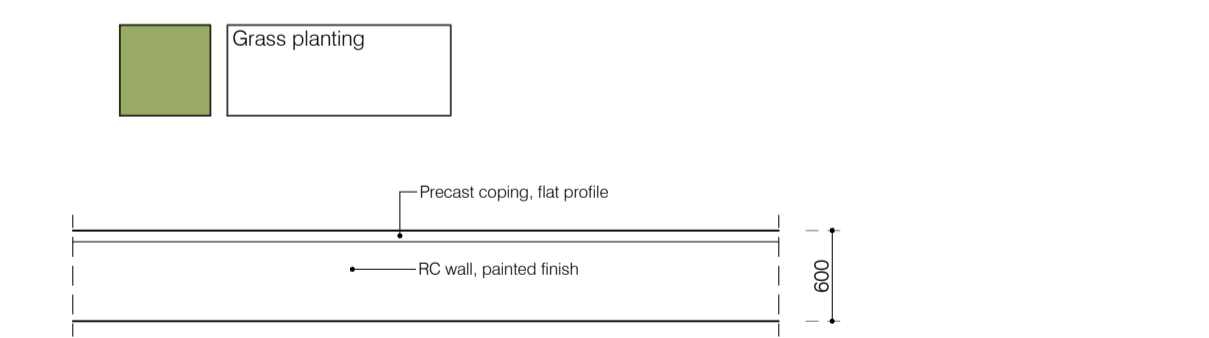
**Proposed Planting / landscaping:**

**Proposed trees:**

Species:	Key nr:	Size / Girth (mm):	Presentation:	Height (m):
Acer Platanoides (maple)	t1	180 -200mm	Transplanted in 120ltr pots	4.2 - 5.0m
Prunus Semula (rowan)	t2	100 -120mm	Transplanted in 75ltr pots	3.5 - 4.2m
Sorbus Aria Lutescens (birch)	t3	180 -200mm	Transplanted in 120ltr pots	4.2 - 5.0m

**Proposed native species hedgerow:**

Species	Size	Height	Spec	Density	%
Crataegus monogyna	BR	40-60cm	2+1	7/in m	60
Prunus spinosa	BR	40-60cm	2+1	7/in m	15
Corylus avellana	BR	40-60cm	2+1	7/in m	15
Ilex aquifolium	C	30-40cm	Bushy	7/in m	10



**Proposed Retaining Detail F'**  
Concrete Wall Scale 1:50

Walls:  
600mm high RC wall with paint finish to match dwelling

**A1**

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**LEGEND**

- Application area
- Land under applicants control
- Existing buildings
- Proposed buildings
- NIE / BT overhead cables
- Items to be demolished
- 2.4 x 80m visibility splays
- Proposed incoming NW connection
- Proposed incoming NIE connection
- Proposed incoming BT connection
- Proposed package treatment plant & sub surface irrigation. Refer to Lisbane Consultants drawing 25-110-B50c
- Proposed storm soakaway. Refer to Lisbane Consultants drawing 25-110-B50c
- Main site entrance
- Proposed hardstanding to driveway / laneway
- Proposed hardstanding to patio / pathway access
- Proposed concrete hardstanding
- Proposed grass planting
- Existing grass planting
- Proposed capping layer. Refer to GORA & remedial strategy report by RSK Engineers.
- Existing trees to be retained
- Proposed trees
- Existing hedgerow to be retained
- Proposed native species hedgerow planting
- Existing shrubbery
- Proposed storm. Refer to Lisbane Consultants drawing 25-110-B50c
- Proposed foul. Refer to Lisbane Consultants drawing 25-110-B50c
- Existing boundary detail A
- Proposed boundary detail A
- Existing boundary detail B
- Proposed boundary detail B
- Existing boundary detail C
- Proposed boundary detail C
- Existing retaining wall
- Proposed boundary detail D
- Proposed Site levels
- Proposed boundary detail E
- Existing Site levels
- Proposed retaining wall detail F

REVISION	DESCRIPTION	INITIALS	DATE
-	DH	-	-
Revision	Drawn By	Chkd By	Date

**Roy Elliot**

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**88 Greencastle Road**  
Kilkeel, BT34 4JL

**Proposed Dwelling & Garage**

**Proposed Site Layout Plan**

**4339 PL03**

Scale	Date
As Shown @ A1	March 2026



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**A1**

**LEGEND**

REVISION	DESCRIPTION	INITIALS	DATE
-	DH	-	-
Revision	Drawn By	Chkd By	Date

Roy Elliot

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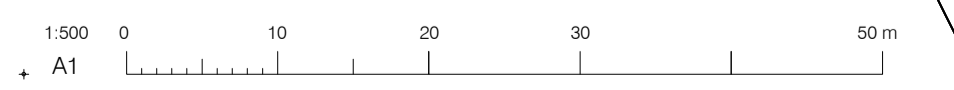
88 Greencastle Road  
 Kilkeel, BT34 4JL

Proposed Dwelling & Garage

Existing Site Layout Plan

**4339 PL02**

Scale: 1:500 @ A1 Date: March 2026





**Mr. Roy Elliott**

# **Generic Quantitative Risk Assessment & Remedial Strategy**

88 Greencastle Road, Kilkeel, Co Down BT34 4JL

604936 – R1 (01)

**MARCH 2026**





## RSK GENERAL NOTES

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**Project No.:** 604936 – R1 (01)

**Title:** Generic Quantitative Risk Assessment & Remedial Strategy - 88 Greencastle Road, Kilkeel, Co Down BT34 4JL

**Client:** Mr. Roy Elliott

**Date:** 12/03/2026

**Office:** Belfast

**Status:** Final

**Author:** Richard Smyth

**Technical reviewer:** Michael Walls

Signature:

Signature:

Date: 12/03/2026

Date:

12/03/2026

Revision control sheet		
Revision ref.	Date	Reason for revision
(00)	20/11/2023	First issue
(01)	12/03/2026	Report updated to reflect most up to date proposed site layout plan

RSK Environment Limited (RSK) has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and RSK. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by RSK for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK Environment Ltd.

Mr. Roy Elliott  
GQRA & Remedial Strategy - 88 Greencastle Road, Kilkeel, Co Down BT34 4JL  
604936 – R1 (01)

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- Figure 2: Proposed site layout plan (Vision Design Drawing No. 4339 PL03)
- Figure 3: Borehole locations (Ground Check Ltd Drawing No. 23-3287/Figure 2)
- Figure 4: Conjectured extent of made ground at the site

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- Table 1: Linkages for generic quantitative risk assessment
- Table 2: Maximum hazardous gas flow rates ( $Q_{hg}$ ) and implied CS for each borehole
- Table 3: Worst case hazardous gas flow rates ( $Q_{hg}$ ) and implied CS for the site

## APPENDICES

- Appendix A: Service constraints
- Appendix B: Newry, Mourne and Down District Council & NIEA's consultation responses
- Appendix C: Site walkover photographs
- Appendix D: Extract from Table 2 in Ground Check Ltd's PRA report
- Appendix E: Borehole logs
- Appendix F: Soil laboratory analysis results
- Appendix G: Ground gas monitoring data
- Appendix H: Generic Assessment Criteria for human health
- Appendix I: Ground gas assessment methodology
- Appendix J: GQRA data screening table – soils
- Appendix K: Radon Risk Report
- Appendix L: Photographs of pipework beneath dwelling
- Appendix M: Laboratory analysis schedule

# 1 INTRODUCTION

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## 1.1 Commissioning

RSK Ireland Limited (RSK) was instructed by Planning Permission Experts on behalf of Mr. Roy Elliott to prepare a Generic Quantitative Risk Assessment (GQRA) in relation to the construction of a new detached residential dwelling and garage at 88 Greencastle Road, Killeel (hereafter referred to as the “site”).

## 1.2 Aims

It is understood that the original planning application for a residential development at the site (Planning Ref: LA07/2018/0097/F) was granted planning permission; however, this was superseded by a more recent application (Planning Ref: LA07/2022/0885/F) following a change in the proposed house type to be constructed at the site. The Environmental Health Department of Newry, Mourne and Down District Council subsequently raised concerns regarding the potential for contamination to be present at the site and, as such, requested that a site investigation be undertaken to determine the nature and extent of any contamination at the site. As a result, construction works at the site were put on hold and Ground Check Ltd completed an intrusive site investigation in August and October 2023.

A copy of Newry, Mourne and Down District Council’s consultation response dated 18<sup>th</sup> August 2022 requesting that a site investigation be undertaken at the site is attached in Appendix B. It is understood that DAERA were also consulted in relation to the current planning application to build a new residential dwelling at the site and have confirmed that they have no objection to the application. A copy of DAERA’s consultation response dated 23<sup>rd</sup> August 2022 is also attached in Appendix B.

The GQRA presented in this report aims to satisfy Newry, Mourne and Down District Council’s requirements with specific regard to determining the existence, nature, extent and concentration of any contaminant sources together with the identification of any remediation works required at the site.

## 1.3 Scope of works

The assessment of the contamination status of the site is in line with the technical approach presented in Land Contamination Risk Management (LCRM) (Environment Agency, 2025) – which supersedes CLR11 Model Procedures for Land Contamination – and in general accordance with BS 10175: 2011 + A2 2017 (BSI, 2017).

This report follows on from the Preliminary Risk Assessment (PRA) completed by Ground Check Ltd in September 2023 and the GQRA is based solely on the site investigation data obtained by Ground Check Ltd between August to October 2023.



## 1.4 Existing reports

Three existing reports prepared by Ground Check Ltd that relate to the site have been reviewed as part of this assessment. These comprise:

- Preliminary Site Investigation Letter Report dated 31<sup>st</sup> August 2023 (Project Ref: 23-3287);
- Preliminary Risk Assessment dated September 2023 (Project Ref: 23-3287); and,
- Ground Investigation Report dated October 2023 (Project Ref: 23-3287).

The findings of these reports are discussed in Sections 3 to 5 of this report.

## 1.5 Limitations

The comments given in this report and the opinions expressed are based on the information available during the completion of the GQRA. However, there may be conditions pertaining to the site that have not been disclosed by the assessment and therefore could not be taken into account.

This report is subject to RSK's service constraints given in Appendix A.

## 2 SITE DETAILS

---

### 2.1 Site location

The site is located at 88 Greencastle Road, c. 2km west of Killeel town centre (centred at Irish Grid Reference 329325, 312821). The site location is shown on Figure 1.

### 2.2 Site description

A site walkover was completed on 9<sup>th</sup> November 2023 by RSK and a selection of photographs is included in Appendix C.

The south western half of the site currently comprises a construction site, whereas the north eastern portion is primarily undeveloped shrubland (Photograph 7). The south western part of the site is situated at a much higher elevation than the north eastern area of the site and the surrounding land. A steep bank separates the south western part of the site from the lower lying north eastern area (Photograph 8). Similarly, a steep bank is also located along the western site boundary (Photograph 5).

The south western part of the site is currently occupied by a new two storey detached residential dwelling (Photograph 1) and separate double garage (Photograph 2), which are both under construction. In addition, two older shed buildings remain on-site (Photographs 3 & 4); one located to the south of the new dwelling and a second in the southern western corner of the site. It is understood that a dwelling was also located in the southwestern corner of the site but this has been demolished.

### 2.3 Surrounding land uses

The site is bordered to the north by a mixture of shrubland and agricultural fields (Photograph 6) and to the south by Greencastle Road. A neighbouring residential property, 84 Greencastle Road, is located immediately adjacent to the eastern site boundary (Photograph 7) and a cluster of residential properties and agricultural buildings are located to the west of the site.

### 2.4 Development Proposals

The proposed development comprises the demolition of the original dwelling (already demolished) and subsequent construction of a two storey detached residential dwelling and separate double garage (both already partially constructed) in the southwestern portion of the site. It is understood that both the dwelling and garage buildings are constructed on precast concrete ring beams, which are supported by piled foundations. In addition, both buildings have Bison precast hollowcore concrete floors.

The areas around the new buildings will be finished with a new tarmac driveway and lawn areas. It is understood that the two existing shed buildings will be retained and the



northeastern part of the site will remain unchanged. The proposed site layout plan is presented as Figure 2.

## 3 SUMMARY OF PRELIMINARY RISK ASSESSMENT

---

The following sections are based on the PRA prepared by Ground Check Ltd and aim to summarise the potential contaminant sources identified at the site and any sensitive receptors at, or in its immediate vicinity. Full details of the PRA are presented in Ground Check Ltd's PRA report dated September 2023 (Project Ref: 23-3287).

### 3.1 Environmental Setting

The PRA revealed that the site is underlain by glacial sand and gravel deposits, which would be considered to represent a potential superficial aquifer and have a high groundwater vulnerability rating (4e). It is possible that the sand and gravel deposits are underlain by glacial till. The bedrock beneath the glacial deposits comprises Silurian greywacke of the Hawick Group, which is classified as an aquifer of limited potential productivity (BI(f)) with low yields common.

In addition to Ground Check Ltd's PRA, RSK also completed a search of the NIEA Water Information Request Viewer and Drinking Water Inspectorate (DWI) Viewer, which revealed that there are no groundwater abstraction sites or private drinking water supplies within a 1km radius of the site.

An unnamed tributary of the White Water River is the nearest watercourse located approximately 250m to the west of the site.

### 3.2 Potential sources of contamination

The PRA revealed that a former licensed inert landfill is located to the north of the site (see Photograph 6 in Appendix C & map attached as Appendix D). It is understood that the landfill comprised an historical sand and gravel pit, which was infilled with inert waste during the 1990s (Planning Application Reference: P/1989/0602) and was subsequently restored for use as agricultural grassland upon surrender of the licence. Planning Application P/1989/0602 was submitted on 16<sup>th</sup> May 1989 and was granted planning approval on 8<sup>th</sup> March 1990. The conjectured extent of the landfill shown in Appendix D (shaded pink) is based on the application area map for Application P/1989/0602 recorded on the Northern Ireland Planning Portal.

Ground Check Ltd surmised that the landfill may extend beneath the south western part of the subject site as ground levels in this area are much higher than the remainder of the site and the area is bounded by steep earth banks (see Photographs 5 & 8 in Appendix C). Consequently, there is potential that the new dwelling could be underlain by waste materials/made ground.

Ground Check Ltd concluded that any made ground present at the site could represent a potential source of soil contamination and ground gases (carbon dioxide and methane). The PRA also revealed that the site is located in an area with high radon potential.

### **3.3 Receptors and exposure pathways**

#### **3.3.1 Risk to future residential site users**

The PRA completed by Ground Check Ltd concluded that the only receptor that could be affected by the potential contaminant sources identified at the site (made ground & radon) would be the future residential site users via the following exposure pathways:

- Dermal contact, ingestion and inhalation exposure with contaminated soil and dust; and,
- Ingress of ground gases, hydrocarbon vapours and radon into on-site buildings, build-up in confined spaces and explosion/ inhalation.

Construction workers were not identified as receptors because any risks posed to workers can be fully managed through adherence to appropriate health and safety procedures including CDM regulations during the construction works.

#### **3.3.2 Risk to environmental receptors**

Ground Check Ltd concluded that there are no sensitive environmental receptors present at the site or in its immediate vicinity, which could be impacted by the identified potential sources of contamination. This reflects the following:

- The nearest watercourse is located a significant distance from the site;
- The underlying bedrock is an aquifer of limited potential productivity;
- Any shallow groundwater present in the glacial sand and gravel deposits beneath the site and surrounding area is vulnerable to the ingress of surface contaminants and, as such, would not be suitable for use as a potable water supply; and,
- No groundwater abstractions are known to be present within 1km of the site.

Ground Check Ltd also make the point that the construction of a new dwelling on the site will have no impact upon the quality of any groundwater present within the glacial sand and gravel. This position is also supported by DAERA's Planning Response Team (specifically the Regulation Unit Land and Groundwater Team) who stated the following in their consultation response dated 23<sup>rd</sup> August 2022 regarding the current planning application:

*“Regulation Unit Land and Groundwater Team note the history of land filling on site and adjacent. RU further note however that the proposed development is for a single dwelling and relocation of a garage and is therefore considered to be a low risk to the water environment. RU would have no objection to any planning application subject to the recommended Conditions and Informatives as detailed.”*

A copy of DAERA's consultation response dated 23<sup>rd</sup> August 2022 is also attached in Appendix B.

#### **3.3.3 Risk to adjacent site users**

Although not identified by Ground Check Ltd as a receptor, Newry, Mourne and Down District Council raised concerns regarding the potential for the off-site migration of contamination from the site onto 84 Greencastle Road. In their consultation response dated 3<sup>rd</sup> October 2023, the Council stated the following:



*“during construction of the dwelling it is possible that pollution pathways may have been altered and for this reason Environmental Health would recommend another sampling borehole near the boundary of the site where it borders the dwelling of 84 Greencastle Road to ensure no offsite pollution has occurred. “*

A copy of Newry, Mourne and Down District Council’s consultation response dated 3<sup>rd</sup> October 2023 is also attached in Appendix B.

### **3.4 Outcome of Preliminary risk assessment**

In light of the findings of the PRA, Ground Check Ltd completed a site investigation and subsequent period of gas monitoring between August and October 2023 in order to fully assess the risks posed to future residential site users and adjacent site users.

## 4 SITE INVESTIGATION WORKS

---

Full details of Ground Check Ltd's site investigation, sampling and testing rationale is presented in their three reports listed in Section 1.4 above; however, the following sections provide a summary of the site investigation works completed by Ground Check Ltd at the site between August and October 2023.

### 4.1 Boreholes

Ground Check Ltd drilled four boreholes (BH01-04) to a maximum depth of 3.5m below ground level (mbgl) using a Dando 2002 Terrier window sampling rig on 11th August 2023. The boreholes were sited adjacent to and around the new dwelling and three of the boreholes (BH01-03) were installed with standpipes to facilitate subsequent gas monitoring.

In their consultation response dated 3<sup>rd</sup> October 2023 (attached in Appendix B), Newry, Mourne and Down District Council appear to have approved the four boreholes drilled at the site by Ground Check Ltd (i.e. "*Environmental Health would have no objections to this submission*") but they also recommended that another borehole be sited "*near the boundary of the site where it borders the dwelling of 84 Greencastle Road to ensure no offsite pollution has occurred.*"

In response to this, Ground Check Ltd drilled two further boreholes (BH05 & 06) to 1.0mbgl along the boundary with of 84 Greencastle Road on 24<sup>th</sup> October 2023 using hand digging and flight auguring equipment.

The borehole locations are shown in Figure 3 and all borehole logs are attached as Appendix E.

### 4.2 Laboratory analysis

A total of six soil samples comprising 3no. made ground samples from BH01-03 and 3no. samples of the natural glacial deposits from BH04-06 were analysed for the following suite of common contaminants typically associated with made ground:

- Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium and Zinc;
- Petroleum hydrocarbons (TPH CWG);
- Polycyclic aromatic hydrocarbons (PAHs);
- Asbestos; and,
- Organic Matter.

Laboratory testing was undertaken at a UKAS accredited laboratory with ISO17025 and MCERTS accredited test methods were specified where applicable for contamination testing and as shown in the laboratory test certificates attached as Appendix F.

### **4.3 Ground gas monitoring**

Six gas monitoring rounds were undertaken at BH01-03 by Ground Check Ltd between August and October 2023. A calibrated infrared gas meter was used to measure gas flow, concentrations of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and oxygen (O<sub>2</sub>) in percentage by volume. In addition, all wells were screened with a PID to determine the presence of any Volatile Organic Compounds (VOCs)/hydrocarbon vapours, and atmospheric pressure was also recorded.

All ground gas monitoring results are attached as Appendix G.

## 5 SITE INVESTIGATION FINDINGS

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The findings of the site investigation works completed by Ground Check Ltd between August and October 2023 are summarised below.

The descriptions of the strata encountered, notes regarding visual or olfactory evidence of contamination, list of samples taken, field observations of soil and groundwater and details of monitoring well installations are included on the borehole logs presented in Appendix E.

### 5.1 Encountered Strata

#### 5.1.1 Made ground

A thin layer (0.1-0.3m thick) of angular gravel (hardcore) was encountered at ground level in the boreholes located around the new dwelling in the south western part of the site (BH01-04), which would not be unexpected given this area is an active construction site. The hardcore layer was found to be underlain by a significant thickness of made ground at BH01 (3.0m+) and BH02 (3.2m+) with a much lesser thickness at BH03 (0.4m). No made ground was recorded in BH04 apart from the surface layer of hardcore. The made ground encountered at BH01, BH02 and BH03 typically comprised a mixture of gravel and reworked silt with occasional pieces of concrete, wood, cinder, glass, plastic, paper and roof tiles.

A thin layer of made ground (0.3m thick) was recorded in BH05 and BH06 located along the boundary with 84 Greencastle Road. The made ground encountered in these boreholes typically comprised topsoil with occasional pieces of broken crockery and brick, which would not be considered to be representative of landfill type waste.

Based on the ground conditions encountered in the boreholes and the observed site levels, Ground Check Ltd have estimated the area of the site that is occupied by made ground, which is shown in Figure 4.

#### 5.1.2 Glacial deposits

Natural glacial deposits comprising firm to stiff brown sandy gravelly silt with cobbles were encountered beneath the made ground layer at BH03-06. Glacial deposits were not recorded at BH01 or BH02 as these boreholes refused on obstructions within the made ground layer.

### 5.2 Groundwater

No groundwater strikes were encountered during the drilling works and the standpipe installations at BH01-03 were found to be dry during all subsequent gas monitoring visits.

### **5.3 Visual / olfactory evidence of contamination**

No visual and/or olfactory evidence of potential contamination was observed during the site investigation works.

### **5.4 Ground gas**

No gas flow was recorded at any of the boreholes on any occasion and no VOCs were detected by PID at any of the monitoring boreholes. Methane was consistently recorded at BH02 at concentrations ranging from 1.0 to 3.4% and was also recorded at BH01 but only on one occasion at 4.5%. Carbon dioxide was consistently recorded at all three boreholes at concentrations ranging from 0.4 to 19.3%.

## 6 QUANTITATIVE RISK ASSESSMENT

### 6.1 Linkages for assessment

As described in LCRM (Environment Agency, 2021), there are two stages of quantitative risk assessment (QRA), Tier 2 generic (GQRA) and Tier 3 detailed (DQRA). The following GQRA comprises the comparison of the soil and ground gas results obtained by Ground Check Ltd with generic assessment criteria (GAC) that are appropriate to the linkage being assessed.

The potential contaminant linkages that require further assessment (as detailed in section 3.2) and the methodology of assessment are presented in Table 1 below.

**Table 1: Linkages for generic quantitative risk assessment**

Potentially relevant contaminant linkage	Assessment method
<b>Future residential site users</b>	
Dermal contact, ingestion and inhalation exposure with contaminated soil and dust	Comparison of soil analysis data to human health GAC in Appendix H for a proposed residential end use with home-grown produce since the proposed development includes lawn/garden areas.
Ingress of hydrocarbon vapours into on-site buildings	Comparison of soil analysis data for potentially volatile contaminants to human health GAC in Appendix H and assessment of VOC data recorded during gas monitoring.
Ingress of radon into on-site buildings	Qualitative assessment based on construction of on-site building
Ingress of ground gases into on-site buildings	Calculation of borehole hazardous gas flow rates ( $Q_{hg}$ ) using maximum (peak) methane and carbon dioxide concentrations and steady state flow rates in accordance with BS8485. See Appendix I for further details on guidance and approach to ground gas assessment.
<b>Adjacent site users</b>	
Off-site migration of contamination from the site to 84 Greencastle Road	Qualitative assessment of all available site data

### 6.2 Assessment of risk posed to future residential site users by contaminated soil and dust

In order to assess the dermal contact, ingestion and inhalation linkage, the soil analysis results have been directly compared against GAC for a residential with home-grown produce end use and a soil organic matter (SOM) of 1% has been selected. The soil screening output spreadsheet is presented as Appendix J.

One of the three samples of made ground analysed (BH01 0.5m) was found to contain concentrations of arsenic, lead and nickel that exceed the residential GAC. No elevated

levels of metals were recorded in the remaining two made ground samples (BH02 & BH03) or the three samples of natural soil analysed (BH04-06).

The concentrations of petroleum hydrocarbons and PAHs detected in the six soil samples analysed are below the residential GAC (and often below laboratory detection limits) and no asbestos fibres were detected in any of the samples analysed.

Based on this assessment, it is considered that the made ground present beneath the southwestern part of the site is not of significantly reduced chemical quality; however, the shallow made ground encountered at BH01 poses a potential risk to future residential site users due to the presence of elevated levels of heavy metals, which will require further consideration (see Section 9).

### **6.3 Assessment of risk posed to future residential site users by hydrocarbon vapours**

No elevated concentrations of any potentially volatile contaminants (TPH <C16, acenaphthene, acenaphthylene and naphthalene) were detected in the six soil samples analysed. Furthermore, no VOCs were detected at any of the monitoring boreholes on any occasion during the ground gas monitoring completed by Ground Check Ltd.

Consequently, it is considered that the made ground present beneath the southwestern part of the site does not pose a risk to future residents through vapour release.

### **6.4 Assessment of risk posed to future residential site users by radon**

Review of the UK map of radon prone areas produced by the UK Health Security Agency (UHS) and the British Geological Survey (BGS) (available to view at UKradon.org) revealed that the site is located in an area with elevated radon potential, where the probability of the site being above the Action Level for radon is estimated to be greater than 30%.

Consequently, RSK obtained Radon Risk Report for the site. This report indicates that the site is actually located in an area with lower radon potential i.e. the probability of the site being above the Action Level for radon is estimated to be between 5 - 10%. A copy of the Radon Risk Report is included in Appendix K.

Although the report only provides the estimated probability that the site is above the Action Level for radon and this does not necessarily mean there is a radon problem at the site, the UHS recommend that basic radon protection measures are installed in any new dwellings to be constructed at the site.

The client has confirmed that basic radon protection measures have been incorporated into the new dwelling comprising the installation of a grid of perforated pipework overlain by a 1200 gauge polythene membrane beneath the precast hollowcore floor. The pipework is connected to a solitary vent point located at ground level on the eastern side of the dwelling. A series of photographs provided by the client showing the installation of the pipework and vent point are attached in Appendix L.

The client advises that Newry, Mourne and Down District Council's Building Control Department previously inspected and signed off the radon protection measures installed

within the new dwelling. On this basis, radon is not considered to pose a risk to the future residents of the new dwelling.

## 6.5 Assessment of risk posed to future residential site users by ground gases

### 6.5.1 Summary of borehole hazardous gas flow rates

The maximum steady state gas flow rate and maximum gas concentrations recorded at each borehole over the six monitoring rounds have been used to calculate the  $Q_{hg}$  for methane and carbon dioxide, which in turn have been used to derive the implied maximum CS for each borehole, as shown in Table 2 below.

**Table 2: Maximum hazardous gas flow rates ( $Q_{hg}$ ) and implied CS for each borehole**

BH no.	Max. steady State Flow Rate (l/hr)	Max. CH <sub>4</sub> (%)	Max. CO <sub>2</sub> (%)	$Q_{hg}$ CH <sub>4</sub> (l/hr)	$Q_{hg}$ CO <sub>2</sub> (l/hr)	Implied CH <sub>4</sub> CS*	Implied CO <sub>2</sub> CS*
BH01	0.1**	4.5	18.7	0.0045	0.0187	1	1
BH02	0.1**	3.4	19.3	0.0034	0.0193	1	1
BH03	0.1**	0.0	7.0	0.0000	0.007	1	1

\* Implied CS from Table 2 of BS8485 using  $Q_{hg}$  flow rates, although Table 2 is for assigning site (or zone) CS based on site characteristic GSV

\*\* Limit of detection of instrument used as no flow measured

### 6.5.2 Worst case check

In accordance with BS8485, the worst case CS the site has also been calculated in Table 3 below by combining the maximum observed flow rate and maximum gas concentrations recorded at any of the boreholes during the six monitoring rounds.

**Table 3: Worst case hazardous gas flow rates ( $Q_{hg}$ ) and implied CS for the site**

Max. steady State Flow Rate (l/hr)	Max. CH <sub>4</sub> (%)	Max. CO <sub>2</sub> (%)	$Q_{hg}$ CH <sub>4</sub> (l/hr)	$Q_{hg}$ CO <sub>2</sub> (l/hr)	Implied CH <sub>4</sub> CS	Implied CO <sub>2</sub> CS
0.1	4.5	19.3	0.0045	0.0193	1	1

### 6.5.3 Designation of site gas screening value (GSV)

Based on the above, the GSV for the site is taken to be 0.019l/hr, which is the worst case for both methane and carbon dioxide. A GSV of 0.019l/hr lies within the range of GSV values for CS1 (<0.07l/hr - Very low risk). However, BS8485 advises that consideration should be given to increasing a site classified as CS1 where methane concentrations exceed 1% and carbon dioxide concentrations exceed 5%.

In light of the above, the ground gas regime at the site and ultimately the requirement for gas protection measures within the new dwelling are considered further in Section 7.

## **6.6 Assessment of risk posed to adjacent site users by contamination migrating from the site**

Based on review of all of the available site data, it is considered highly unlikely that any significant contamination is migrating off-site to 84 Greencastle Road. This reflects the following:

- The made ground present beneath the southwestern part of the site (encountered in BH01-03) primarily comprises reworked silt and no visual and/or olfactory evidence of contamination was observed within this material during the site investigation works.
- Laboratory analysis of the soil samples retrieved from the site by Ground Check Ltd revealed that the made ground is not of significantly reduced chemical quality.
- The made ground present in the southwestern part of the site (conjectured extent shown on Figure 4) is located a significant distance (c. 70m) from the site boundary with 84 Greencastle Road.
- Glacial deposits comprising firm to stiff silt were encountered at shallow depth (below 0.3mbgl) in BH05 and BH06 located along the boundary with 84 Greencastle Road. These low permeability glacial deposits will limit the potential for the migration of any contaminants (in the form of contaminated groundwater, vapours or ground gases) from the site onto the property at 84 Greencastle Road.

## 7 FURTHER GAS ASSESSMENT

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As discussed in Section 6.5, the GSV for the site (or more accurately the south western part of the site) has been calculated to be 0.019l/hr, which lies within the range of GSV values for CS1 (<0.07l/hr - Very low risk). However, BS8485 advises that consideration should be given to increasing a site classified as CS1 where methane concentrations exceed 1% and carbon dioxide concentrations exceed 5%.

Based upon a review of all available site data and current ground gas assessment guidance, we believe that increasing the site classification to CS2 would be overly conservative as discussed in the following sections.

### 7.1 Limited organic matter present in made ground

As discussed in Section 5.1, the made ground encountered at BH01, BH02 and BH03 typically comprises a mixture of gravel and reworked silt with occasional pieces of concrete, wood, cinder, glass, plastic, paper and roof tiles. Whilst it is clear some organic matter is present in the made ground, the amounts recorded in the form of wood and paper appears to be negligible. This is not unexpected given the historical landfill was only licensed to accept inert waste.

In addition, the three samples of made ground retrieved from BH01-03 were tested for organic matter and returned concentrations of 6.4%, <0.4% and <0.4% (see laboratory test certificates attached as Appendix F). This corresponds to a calculated average organic matter content of 2.4%, which would not be considered particularly elevated. For reference the calculated average organic matter content of the three samples of glacial deposits retrieved from BH04-06 is 2.5%.

The composition of made ground encountered beneath the south western part of site would not be representative of a significant source of ground gas. In guidance published by the Chartered Institute of Environmental Health (*The Local Authority Guide to Ground Gas (2008)*, Table 3.1), the gassing potential of made ground with a low degradable organic content (i.e. <5%) is classed as very low and the level of risk for on-site development is classified as very low with a negligible risk of lateral migration.

Furthermore, recent guidance published by the NHBC (*Hazardous ground gas - an essential guide for housebuilders*, April 2023) considers that made ground is unlikely to be a significant source of ground gas, specifically making the following comments:

- *“Made Ground soils are not inherently a significant source of hazardous ground gas. Typically, substantial proportions of putrescible materials such as vegetation, food waste, paper, cardboard, wood are required to be a source of gas in the ground.”*
- *“Made Ground comprising reworked natural soils is very unlikely to be a significant source of gas.”*

- *“Made Ground comprising mostly soil without significant proportions of degradable materials is not likely to be a significant gas source.”*

## 7.2 Low ground gas pressure

It is noted that in soils where ground gas generation is very low, ground gas pressures are also according low. This scenario is evidenced at the site by the absence of any gas flow recorded during the gas monitoring programme within the three installed boreholes (all flow rates recorded to be 0.0l/hr). In this scenario, ground gas is effectively trapped in the pore spaces of the soil and it is migrating out of the ground very slowly; however, the installation of monitoring boreholes can disturb and release the gases trapped in the pore spaces resulting in elevated concentrations of methane being recorded, which do not necessarily pose a risk to the future development of the site.

Furthermore, a research bulletin from CL:AIRE (RB17, 2012) notes that *“gas wells are an artificial construction in the ground that can in some specific instances cause high flow rates or gas concentrations from or in the well headspace that are not necessarily representative of sustained surface gas emissions”*.

## 7.3 Limited detections of methane

Methane was only consistently recorded at BH02 at concentrations ranging from 1.0 to 3.4%. Methane was only recorded on one occasion at BH01 and was not recorded during any monitoring round at BH03.

## 7.4 Over conservatism of gas assessments

Recent guidance published by the NHBC (*Hazardous ground gas - an essential guide for housebuilders*, April 2023) is particularly critical of over conservatism seemingly adopted by many ground gas assessors across the UK. The NHBC state that a key issue frequently identified are *“overly conservative assessments on Low Risk sites”* and that the purpose of the new guidance is *“to avoid unnecessary gas protection on low/minimal risk sites”*.

With specific respect to the increasing the Characteristic Situation of a site, NHBC state the following on Page 46 of the guidance, *“BS8485 advises that there is a requirement to consider an increase from CS1 to CS2 if methane concentrations exceed 1% v/v or carbon dioxide concentrations exceed 5% v/v however, increasing the classification is not mandatory. It is only necessary to increase the classification where a high risk source of gas is present such as from domestic landfills and open mine workings, or where there are consistently elevated methane concentrations in a number of wells across a site in Made Ground. It is not normally appropriate to increase the classification when there are sporadic and isolated elevated methane results and the source of gas is Made Ground with limited organic content, Alluvium or similar sources. For example, natural carbon dioxide concentrations can be up to 30% and methane in Made Ground can be up to 30% with no risk to development and no requirement to increase from CS1 to CS2.”*

NHBC's new guidance strongly suggests that to increase the Characteristic Situation for the site from CS1 to CS2 due to the presence of methane concentrations of up to 4.5% at essentially one borehole and carbon dioxide concentrations of up to 19.3% would be over conservative, particularly given the limited organic content of the made ground and the absence of any gas flow from the monitoring boreholes.

## **7.5 Requirement for gas protection measures**

We would consider that the classification of the site as CS1 with respect to ground gas generation is appropriate in this instance. This primarily reflects that the made ground present across the south western part of the site does not represent a significant source of ground gas. Therefore, it is considered that no gas protection measures need to be installed within the new dwelling.

Regardless of the above, it should be noted the radon protection measures installed within the new dwelling (described in Section 6.4) will also inherently provide some level of ground gas protection.

## 8 CONCLUSIONS

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The following sections summarise the findings to the risk assessment undertaken for the site.

### 8.1 Risk posed to future residential site users

The PRA completed by Ground Check Ltd identified potential risks to future residential site users via dermal contact, ingestion and inhalation pathways with potentially reduced quality made ground, ground gases, vapours and radon.

These pollutant linkages were further assessed by targeted intrusive site investigation works, laboratory analysis of soil samples and ground gas monitoring. Soil analysis results were then compared against the RSK derived GAC for a residential end use with home-grown produce and the gas monitoring results assessed in accordance with BS8485.

Basic radon protection measures have already been incorporated into the new dwelling and the site has been classified as Characteristic Situation 1 (Very Low Risk) with respect to ground gas potential. Furthermore, no volatile hydrocarbon contamination or vapours have been identified at the site. Therefore, the site is not considered to pose a risk to future residents through ground gas, vapour or radon generation.

In general, the made ground identified beneath the southwestern part of the site is not considered to be of significantly reduced chemical quality; however, the shallow made ground encountered at BH01 poses a potential risk to future residential site users due to the presence of elevated levels of heavy metals.

**Given the above findings, it would be considered prudent to install a capping layer of clean soil across any proposed garden/lawn areas to be located in the southwestern part of the site around the new dwelling as part of the current development proposal. The details of this capping layer are outlined in Section 9.**

### 8.2 Risk posed to adjacent site users

Although not identified by Ground Check Ltd as a receptor, Newry, Mourne and Down District Council raised concerns regarding the potential for the off-site migration of contamination from the site onto 84 Greencastle Road.

Based on review of all of the available site data, it is considered highly unlikely that any significant contamination is migrating off-site to 84 Greencastle Road. This reflects the made ground identified beneath the southwestern part of the site was not found to be of significantly reduced chemical quality and is located a significant distance from 84 Greencastle Road. Furthermore, the presence of low permeability glacial deposits beneath the site and surrounding area will limit the potential for the off-site migration of any contaminants from the site.

## 9 REMEDIAL STRATEGY

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### 9.1 Capping layer

It is recommended that a physical barrier, in the form of a 600mm thick capping layer, be emplaced across any proposed garden/lawn areas to be located within the area of the site that is potentially underlain by made ground as shown in Figure 4. The thickness of 600mm is recommended as disturbance /mixing of soils is unlikely to exceed 600mm in a typical garden as detailed in BRE465. The area requiring emplacement of the capping layer is shown on Figure 2 (see hatched red area).

An appropriately qualified person should supervise the works to ensure the capping layer is installed with appropriate material and that the works are appropriately verified to ensure the remedial measures adopted are effective. The proposed method and sequence of the remedial works are set out below.

- If required due to site levels, the contractor should excavate to 600mm below finished levels in the proposed garden areas. The excavated materials should be classified for removal off site in accordance with current waste management legislation;
- Where appropriate, the excavated materials may be retained onsite for re-use beneath areas of hardstanding such as the new driveway, as the placing of the material under hardstanding will break any potential pollutant linkage and reduce the requirement for material to be disposed of in a landfill;
- The contractor should identify an appropriate source(s) of material to reinstate the excavations/form the capping layer. Prior to using the material, a desk-based assessment of the source site should be undertaken, and representative samples analysed for the suite of analysis as detailed in Appendix M. One sample should be tested approximately every 100m<sup>3</sup> of material imported to the site. The results of the analysis should be compared to the Generic Assessment Criteria (GAC) included in Appendix H and only used providing the data does not exceed the relevant criteria;
- The capping layer should comprise a minimum of 400mm of suitable material and 200mm of topsoil; and,
- A photographic record of the works should be maintained and presented as part of the validation report for the proposed remedial works.

### 9.2 Validation report

In line with current best practice, a validation report should be produced for the remedial works at the site in line with LC:RM.

The Validation Report should be prepared upon completion of the remediation works and should incorporate photographic records and the quality assurance laboratory data demonstrating the chemical suitability of the imported material, as well as records of the on-site reuse or off-site disposal of any contaminated materials removed from the shared amenity space and landscaped areas in order to facilitate the emplacement of the capping layer.

In addition to the provision of factual data, the Validation Report should confirm that the remediation measures comply with relevant legislation, any relevant planning conditions for the site and that the outcome of the project has met its remediation objectives and criteria to ensure the protection of future residential site users.

### **9.3 Previously unidentified Contamination**

In the event that previously unidentified contamination is uncovered during the development works, the following procedure should be implemented in accordance with LCRM:

- The Contractor will make the area secure and seek the advice of an appropriately qualified environmental engineer and inform the client or their representative;
- The environmental engineer will inspect the area, develop and implement an investigation to establish the nature and extent of the impacted area, this may include intrusive site investigation and laboratory analysis in accordance with LCRM and other relevant guidance;
- Upon establishing the potential associated risks to the identified receptors and if necessary an appropriate remedial strategy will be developed and implemented;
- Remedial works will be agreed with the appropriate regulator; and,
- The impacted area will be validated and a report will be prepared in accordance with LCRM.

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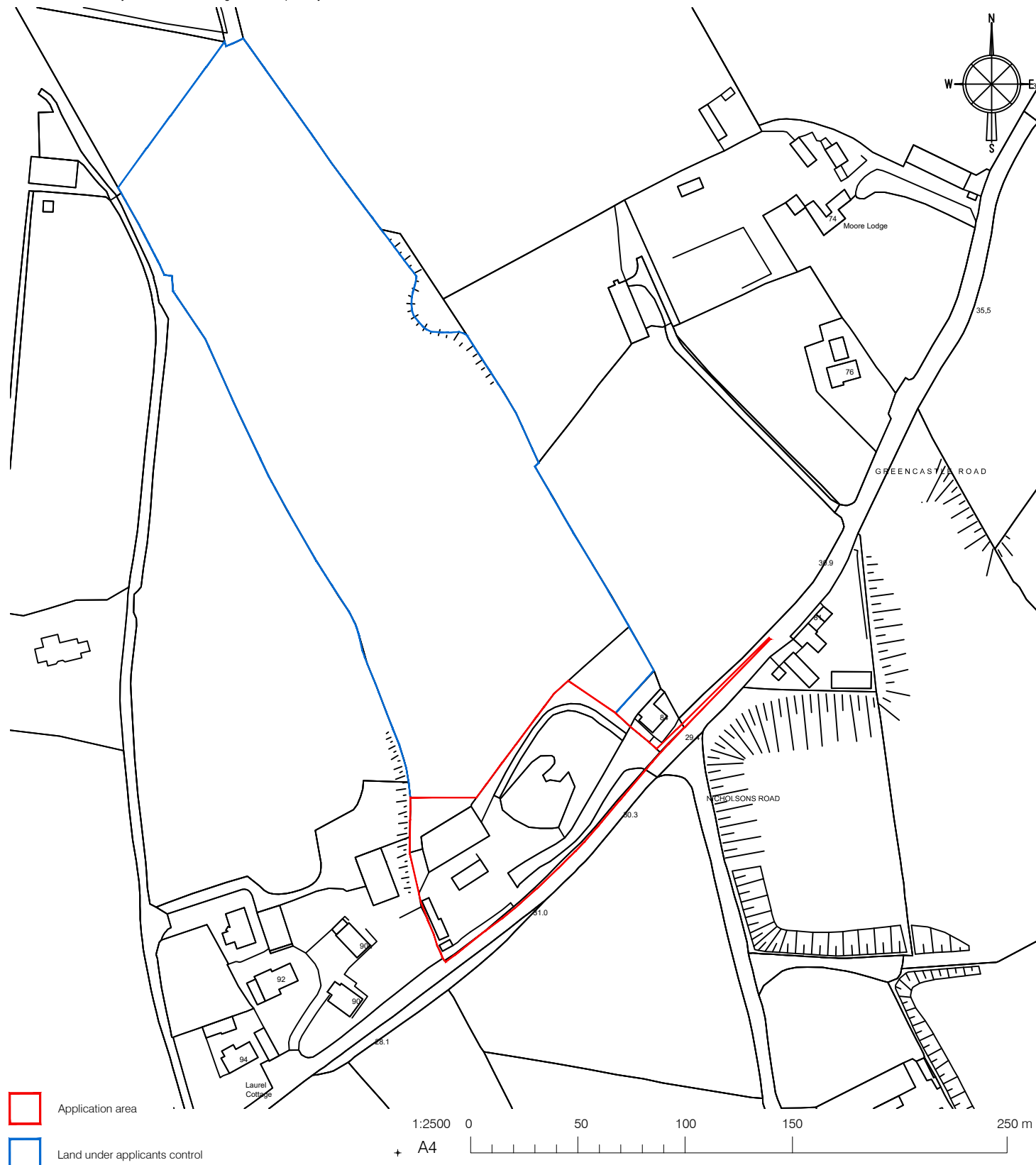
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## FIGURES

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© Copyright rests with Vision Design. This drawing may not be reproduced wholly or in part without the express written permission of Vision Design. All drawings issued prior to the relevant Planning and Building Regulations have been obtained are to be deemed preliminary. Any works carried out based on preliminary drawings are entirely at the clients risk. Vision Design cannot be held responsible for additional works/expense incurred on this basis. Contractors to carry out their own due diligence and report any errors to this office.



 Application area  
 Land under applicants control

1:2500 0 50 100 150 250 m  
 + A4

Roy Elliot		88 Greencastle Road Kilkeel, BT34 4JL			Location Plan	
<b>VISION</b> DESIGN   ARCHITECTURE 31 Rainey Street Magherafelt N. Ireland BT45 5DA visiondesign.org.uk tel: 028 7930 0866		Proposed Dwelling & Garage			4339 PL01	
		-	DH	-	-	Scale 1:2500 @ A4
		Revision	Drawn By	Chkd By	Date	Comments
					Area 0.71 ha	IG -

**DII ROADS NOTES**

**PARKING / TURNING**  
The required vehicle parking and turning areas to be provided with in the curtilage of the site. Provision must be made for vehicles to reverse and exit in forward gear. (Private drive 18 m x 3.2 m. Over 3 bedrooms require 24 m x 3.2 m).

**VISIBILITY SPLAYS**  
Visibility splays must be retained in perpetuity.

**VISIBILITY SPLAYS**  
The area within the visibility splays shall be cleared to provide a level surface no higher than 250mm above the level of the adjoining carriageway and shall be retained and kept clear thereafter.

**POLES/COLUMNS**  
Any pole or column materially affecting visibility must also be removed. A maximum of 1 No. pole or column is acceptable in each visibility splay. The cost of removing columns/poles is borne by the Applicant.

**HEDGES, ETC**  
Any hedges/walls/fences/trees/shrubs (of any height) located in front of the visibility splays shall be removed.

**FENCE/WALL**  
The line of any new fence or wall must be positioned behind the visibility splays. It is recommended that any new trees or shrubs be planted at least 1.0m back from the visibility splays to allow for future growth and some species will require additional set back.

**DRAINAGE**  
Drainage shall be provided where necessary to prevent water from the access flowing onto the public road. Similarly the existing road drainage must be accommodated where appropriate and measures must be taken to prevent road surface water from flowing onto the access.

It is the Applicant's responsibility to ensure that surface water from the roof of the development does not flow onto the public road, including the footway.

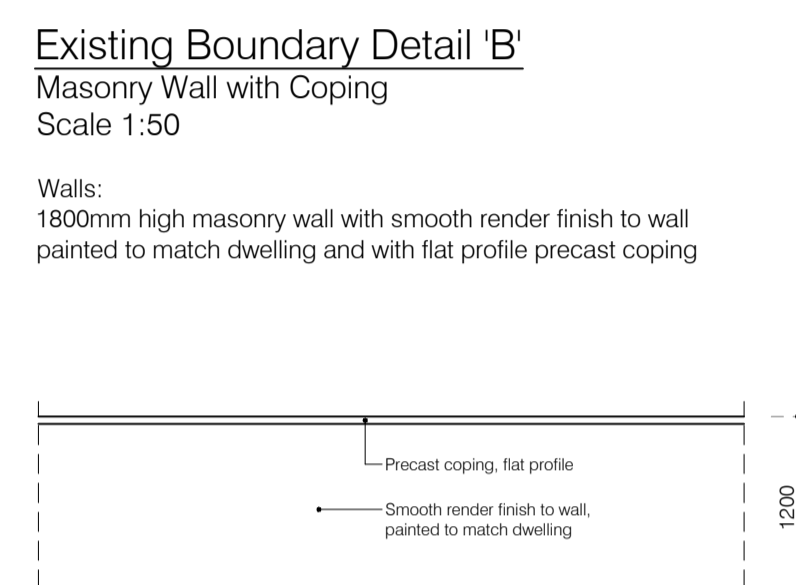
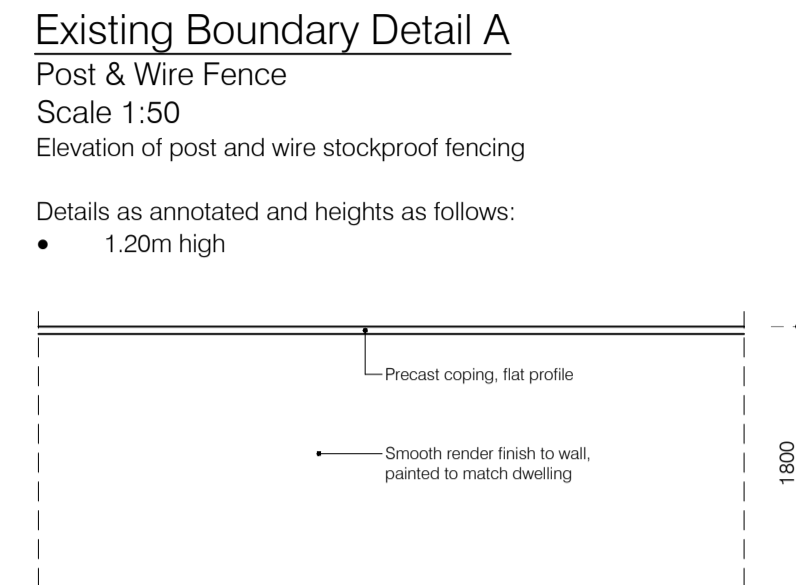
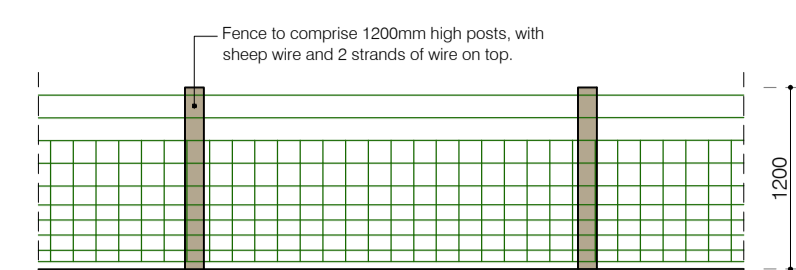
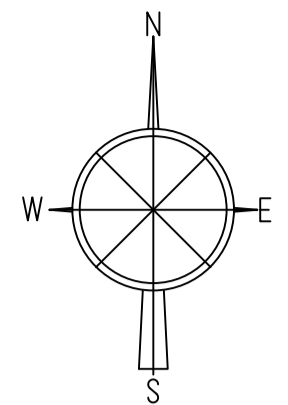
**GRADIENT**  
Gradient of the access shall not exceed 1:12.5 (8%) over the first 5 metres outside the road boundary, i.e. from the back of the verge/ back of footway / fence-line / edge of carriageway. Where vehicular access crosses the footway, the access gradient shall be between 1:25 (4%) maximum and 1:40 (2.5%) minimum and shall be formed so that there is no abrupt change of slope along the footway

**GATES / SECURITY BARRIERS**  
Entrance gates, where erected, should be sited at least 5 metres from the edge of the carriageway. Where this is not possible, they shall be sited so that when open they do not project over the footway, verges, or carriageway.

**DRIVEWAY WIDTH**  
Minimum width 3.2 m. Maximum - 5.0m

Proposed storm soakaway for access road. Refer to Lisbane Consultants drawing 25-110-B50c for drainage details & levels

Note - area with cross hatching denotes areas that require remedial actions as per GORA & remedial strategy report by RSK Engineering regarding placement of 600mm capping layer to any proposed lawn / garden areas. Areas that require the capping layer are to be dug out / filled in to allow for placement of 600mm deep of suitable materials & top soil to then form finished ground levels.



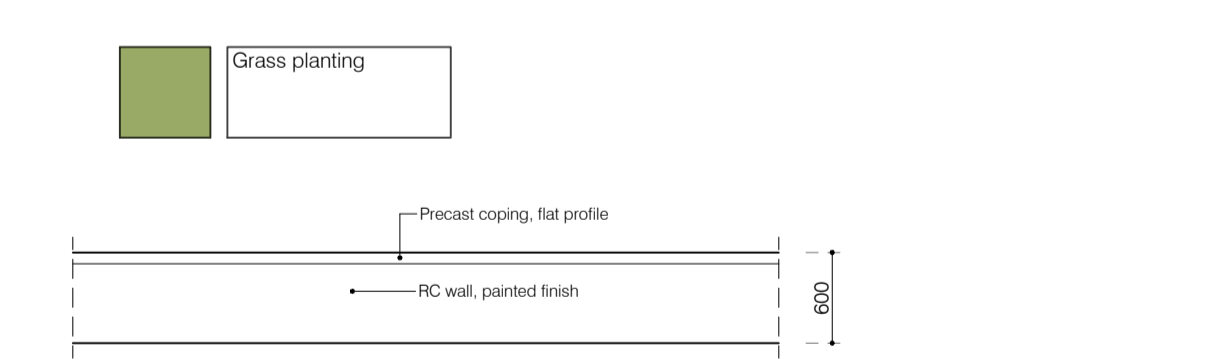
**Proposed Planting / landscaping:**

**Proposed trees:**

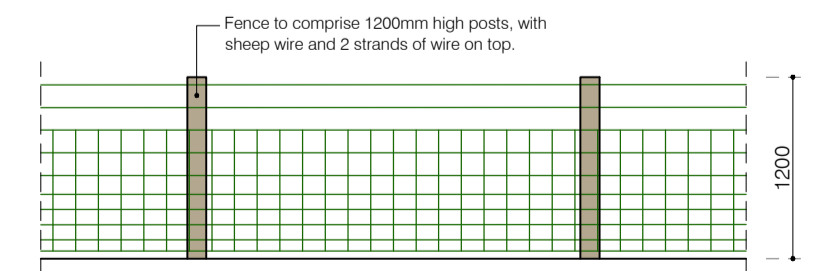
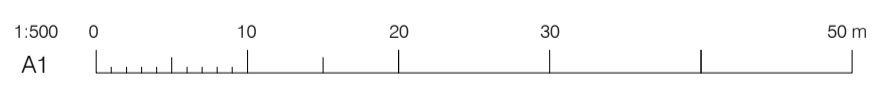
Species:	Key nr:	Size / Girth (mm):	Presentation:	Height (m):
Acer Platanoides (maple)	t1	180 -200mm	Transplanted in 120ltr pots	4.2 - 5.0m
Prunus Semula (rowan)	t2	100 -120mm	Transplanted in 75ltr pots	3.5 - 4.2m
Sorbus Aria Lutescens (birch)	t3	180 -200mm	Transplanted in 120ltr pots	4.2 - 5.0m

**Proposed native species hedgerow:**

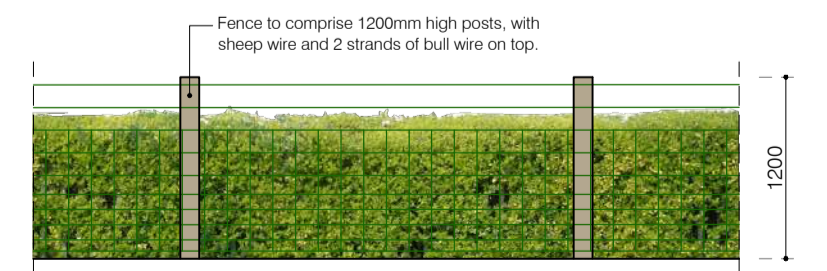
Species	Size	Height	Spec	Density	%
Crataegus monogyna	BR	40-60cm	2+1	7/in m	60
Prunus spinosa	BR	40-60cm	2+1	7/in m	15
Corylus avellana	BR	40-60cm	2+1	7/in m	15
Ilex aquifolium	C	30-40cm	Bushy	7/in m	10



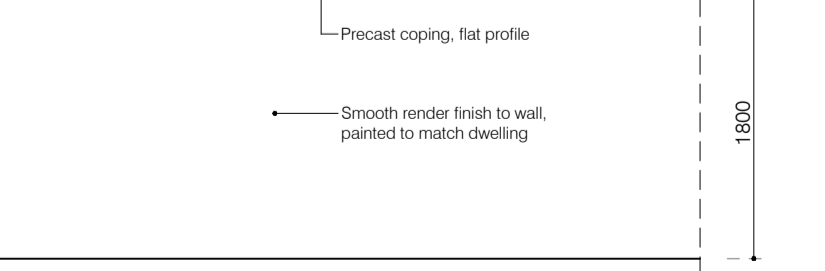
**Proposed Site Layout Plan**  
Scale 1:500



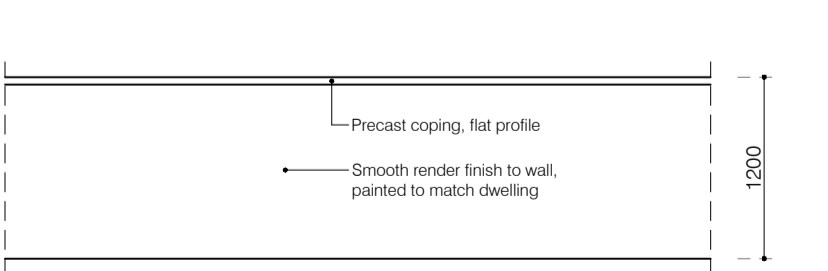
**Proposed Boundary Detail A**  
Post & Wire Fence  
Scale 1:50  
Elevation of post and wire stockproof fencing  
Details as annotated and heights as follows:  
• 1.20m high



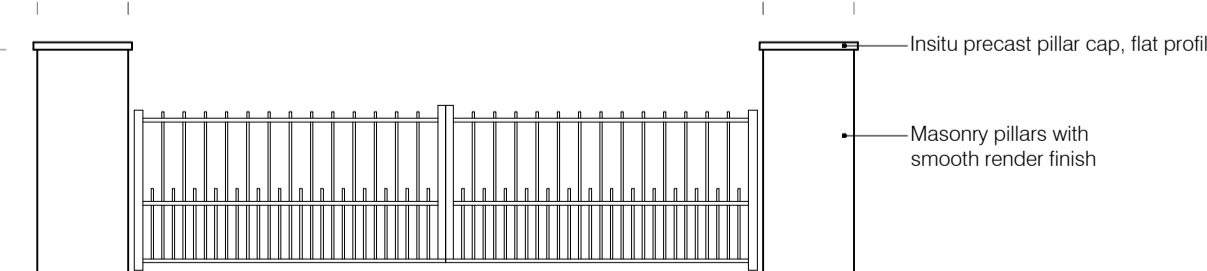
**Proposed Boundary Detail B**  
Post & Wire Fence with Hedgerow Planting  
Scale 1:50  
Elevation of post and wire stockproof fencing with hedgerow planting  
Details as annotated and heights as follows:  
• 1.20m high



**Proposed Boundary Detail C**  
Masonry Wall with Coping  
Scale 1:50  
Walls: 1800mm high masonry wall with smooth render finish to wall painted to match dwelling and with flat profile precast coping



**Proposed Boundary Detail D**  
Masonry Wall with Coping  
Scale 1:50  
Walls: 1200mm high masonry wall with smooth render finish to wall painted to match dwelling and with flat profile precast coping



**Proposed Boundary Detail E**  
Access Gate & Pillars  
Scale 1:50  
Gates / Pillars: Elevation of galvanised steel gate, colour black, with 1500mm high masonry pillars with smooth render finish painted to match dwelling and with flat profile precast pillar caps

- Copyright rests with Vision Design. This drawing may not be reproduced wholly or in part without the express written permission of Vision Design.
- All drawings issued prior to the relevant Planning and Building Regulations have been obtained are to be deemed preliminary. Any works carried out based on preliminary drawings are entirely at the clients risk. Vision Design cannot be held responsible for additional works/expense incurred on this basis.
- Contractors to carry out their own due diligence and report any errors to this office.
- All dimensions are in mm unless stated otherwise

**LEGEND**

- Application area
- Land under applicants control
- Existing buildings
- Proposed buildings
- NIE / BT overhead cables
- Items to be demolished
- 2.4 x 80m visibility splays
- Proposed incoming NW connection
- Proposed incoming NIE connection
- Proposed incoming BT connection
- Proposed package treatment plant & sub surface irrigation. Refer to Lisbane Consultants drawing 25-110-B50c
- Proposed storm soakaway. Refer to Lisbane Consultants drawing 25-110-B50c
- Main site entrance
- Proposed hardstanding to driveway / laneway
- Proposed hardstanding to patio / pathway access
- Proposed concrete hardstanding
- Proposed grass planting
- Existing grass planting
- Proposed capping layer. Refer to GORA & remedial strategy report by RSK Engineers.
- Existing trees to be retained
- Proposed trees
- Existing hedgerow to be retained
- Proposed native species hedgerow planting
- Existing shrubbery
- Existing boundary detail A
- Existing boundary detail B
- Existing boundary detail C
- Existing retaining wall
- Proposed storm. Refer to Lisbane Consultants drawing 25-110-B50c
- Proposed foul. Refer to Lisbane Consultants drawing 25-110-B50c
- Proposed boundary detail A
- Proposed boundary detail B
- Proposed boundary detail C
- Proposed boundary detail D
- Proposed boundary detail E
- Proposed retaining wall detail F

**REVISION DESCRIPTION INITIALS DATE**

Revision	Drawn By	Chkd By	Date	Comments
-	DH	-	-	

**Roy Elliot**

**VISION**  
DESIGN | ARCHITECTURE

31 Rainey Street  
Magherafelt  
N. Ireland  
BT45 5DA  
visiondesign.org.uk  
tel: 028 7930 0866

**88 Greencastle Road  
Kilkeel, BT34 4JL**

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**Proposed Dwelling & Garage**

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**Proposed Site Layout Plan**

---

**4339 PL03**

Scale As Shown @ A1	Date March 2026
------------------------	--------------------



Legend Key

- ◆ Locations By Type - Empty
- ◆ Locations By Type - BH



Drawing Title

Figure 2 Borehole Locations

Project ID

23-3287

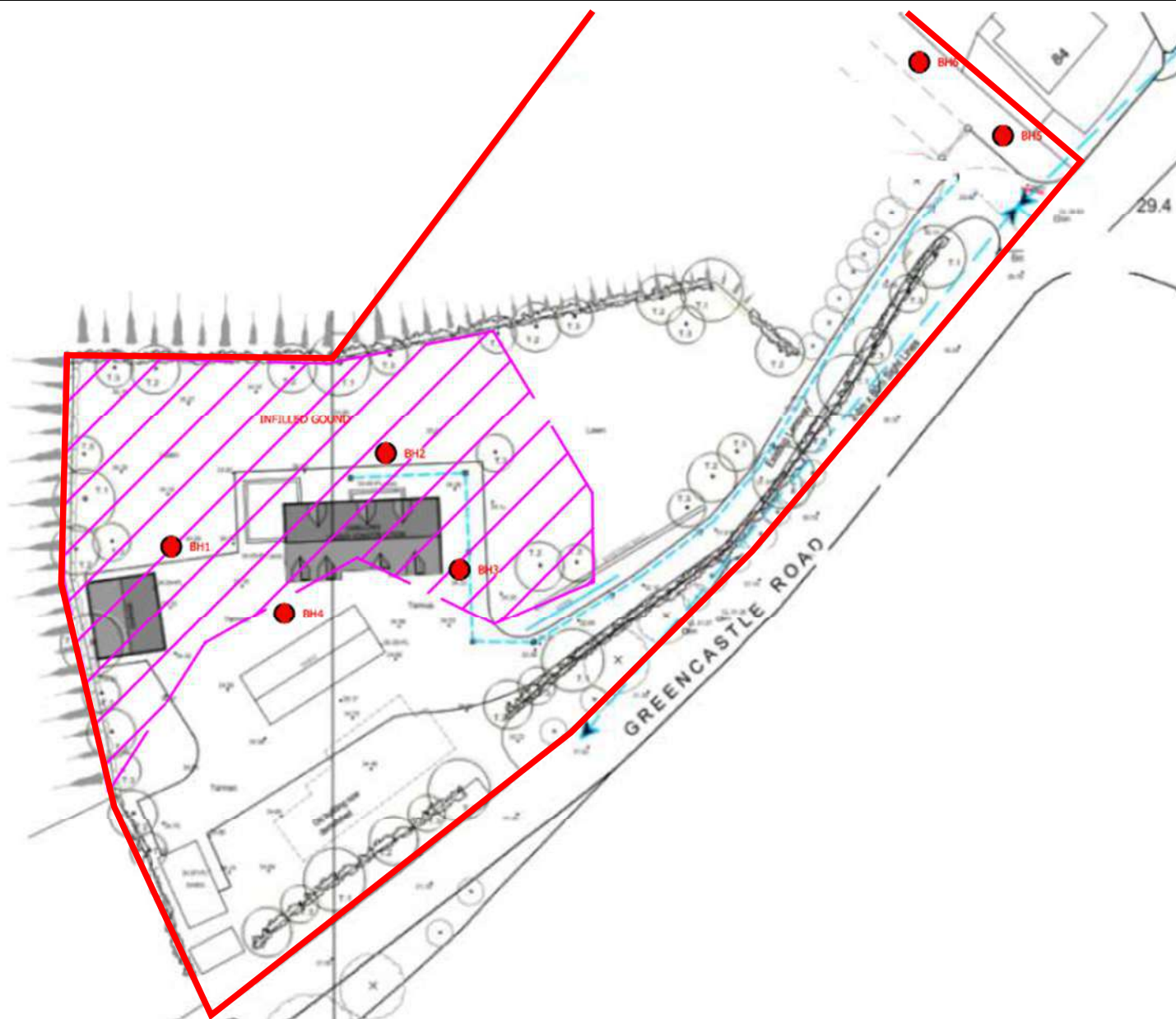
Project Name

Preliminary Risk Assessment

Project Location

88 Greencastle Road, Kilkeel,  
Co. Down

Scale: 1:750



- Redline Boundary
- Extent of made ground



Figure 4

Figure Name  
 Conjectured extent of made ground at the site  
 (extract from Figure 3 in Ground Check's PRA report dated Sept 2023)

Site Name  
 88 Greencastle Road,  
 Kilkeel

Project Number 604936	Date 12/03/2026
--------------------------	--------------------

Revision 01	Drawing by RS
----------------	------------------



# APPENDIX A: SERVICE CONSTRAINTS

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## RSK ENVIRONMENT LIMITED SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Mr. Roy Elliott (the "client") in accordance with the terms of a contract between RSK and the "client", dated 30<sup>th</sup> October 2023. The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.
2. Other than that expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date hereof, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a walk-over survey of the site together with RSK's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The Services are also based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely. The Services clearly are limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the walk-over survey. Further RSK was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.
8. The phase II or intrusive environmental site investigation aspects of the Services is a limited sampling of the site at pre-determined borehole and soil vapour locations based on the operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information,] and it should not be inferred that other chemical species are not present.
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site.



# **APPENDIX B: NEWRY, MOURNE AND DOWN DISTRICT COUNCIL & NIEA'S CONSULTATION RESPONSES**

---



**Newry, Mourne and Down District Council Environmental Health**

**Environmental Health Ref:** 4449/22

**Planning Application Ref:** LA07/2022/0885

**Date Received:** 4/08/2022

1. <b><u>NOISE (includes vibration)</u></b> a) Potential to cause adverse impact. b) Proposal may be adversely affected.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. <b><u>AIR POLLUTION</u></b> a) Potential to cause adverse impact. (eg odour, dust) b) Proposal may be adversely affected.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
3. <b><u>GENERAL AMENITY</u></b> a) Potential to cause adverse impact (vermin/litter) b) Proposal may be adversely affected.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
4. <b><u>AMBIENT AIR QUALITY</u></b> a) Potential to cause adverse impact. b) Proposal may be adversely affected.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
5. <b><u>CONTAMINATED LAND</u></b> Potentially contaminated due to: a) a previous use of the site b) use, or a previous use, of adjacent land c) naturally occurring levels of contamination.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
6. <b><u>OTHER CONSIDERATIONS</u></b> a) Other Environmental Health considerations	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Accompanied by Environmental Statement (ES) Has ES Been considered.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Has 3 <sup>rd</sup> party (eg objector/EHS) comment been received Has 3 <sup>rd</sup> party (eg objector/EHS) comment been considered	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Should Other agencies be involved as additional consultees? (Please Specify) E.g. NIEA, Land Resources Unit, IPRI, HSENI, etc.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>  NIEA Contaminated Land Unit



### Environmental Health Recommendation

No Issues of Concern Arising	
Essential Information Not Provided	X
Substantive Response Provided	
Considered – No Comment Necessary	
Superseded by Further Consultation	
Issues to be Addressed in Future ES	
Issues to be Addressed in Future Application	
Consulted on Error	

#### Comments

This dwelling footprint is near a closed waste management site. In order to ensure that the proposed site for the dwelling has been suitably investigated for potential contamination sources the following condition shall be imposed:

No development approved shall be commenced until further assessment is undertaken as follows:

- A site investigation is undertaken in sufficient detail to determine the existence, nature, extent and concentration of any contaminant sources; in order to appropriately identify any necessary remediation works required.
- Prior to commencement of any proposed site investigation works written details of the proposed site investigation strategy shall be submitted to Planning Service (in consultation with the Environmental Health Department of Newry Mourne and Down District Council) in the form of a site investigation report for prior written approval.
- The applicant shall have full regard to all relevant and current guidance and standards during the site investigation process and shall incorporate such detail within any site investigation report to be submitted for prior approval by Planning Service (in consultation with the Environmental Health Department of Newry Mourne and Down District Council).
- A written report, which contains the investigation strategy, findings and conclusions of the site investigation works, shall be submitted to Planning Service (in consultation with the Environmental Health Department of Newry Mourne and Down District Council) for prior written approval.
- If required, a written remediation scheme for the site in order to ensure that the site is suitable for its intended development end-use is submitted to Planning Service (in consultation with the Environmental Health Department of Newry Mourne and Down District Council) for prior written approval.



This response has been provided on behalf of Environmental Health, Newry, Mourne and Down District Council.

Date 18 August 2022

**NOTE:** Any consultation response provided by the Environmental Health Service is based on:

- information supplied by the applicant, and
- other information currently available.



**Newry, Mourne and Down District Council Environmental Health**

**Planning Application Ref: LA07/2022/0885**

**Date Received: 5/09/2023**

<p><b>1. NOISE (includes vibration)</b> a) Potential to cause adverse impact. b) Proposal may be adversely affected.</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>
<p><b>2. AIR POLLUTION</b> a) Potential to cause adverse impact. (eg odour, dust) b) Proposal may be adversely affected.</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>
<p><b>3. GENERAL AMENITY</b> a) Potential to cause adverse impact (vermin/litter) b) Proposal may be adversely affected.</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>
<p><b>4. AMBIENT AIR QUALITY</b> a) Potential to cause adverse impact. b) Proposal may be adversely affected.</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>
<p><b>5. CONTAMINATED LAND</b> Potentially contaminated due to: a) a previous use of the site b) use, or a previous use, of adjacent land c) naturally occurring levels of contamination.</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>
<p><b>6. OTHER CONSIDERATIONS</b> a) Other Environmental Health considerations</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>
<p>Accompanied by Environmental Statement (ES) Has ES Been considered.</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>
<p>Has 3<sup>rd</sup> party (eg objector/EHS) comment been received Has 3<sup>rd</sup> party (eg objector/EHS) comment been considered</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> <b>No comments visible on the new consultation</b></p>
<p>Should Other agencies be involved as additional consultees? (Please Specify) E.g. NIEA, Land Resources Unit, IPRI, HSENI, etc.</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>  NIEA Contaminated Land Unit</p>



### Environmental Health Recommendation

No Issues of Concern Arising	
Essential Information Not Provided	
Substantive Response Provided	X
Considered – No Comment Necessary	
Superseded by Further Consultation	
Issues to be Addressed in Future ES	
Issues to be Addressed in Future Application	
Consulted on Error	

#### Comments

Environmental Health notes the submission of a site investigation report dated 31 August 2023. It would appear this document contains the detail of the proposed site investigation strategy for this site which was required to be submitted for approval before the findings are reported on.

Environmental Health would have no objections to this submission but would request the following to be included in the forthcoming reports,

1 that the reports have regard to all relevant guidance considering CLR11 has been withdrawn by government.

2 during construction of the dwelling it is possible that pollution pathways may have been altered and for this reason Environmental Health would recommend another sampling borehole near the boundary of the site where it borders the dwelling of 84 Greencastle Road to ensure no offsite pollution has occurred. This location should be agreed with Environmental health prior to any works being carried out.

This response has been provided on behalf of Environmental Health, Newry, Mourne and Down District Council.

Date 3 October 2023

**NOTE:** Any consultation response provided by the Environmental Health Service is based on:

- information supplied by the applicant, and
- other information currently available.

Planning Response Team  
Klondyke Building  
Cromac Avenue  
Gasworks Business Park  
Lower Ormeau Road  
Belfast BT7 2JA  
Telephone: 028 9056 9604

Date: 23 August 2022

Dear Sir/Madam,

**Planning Application Ref.:** LA07/2022/0885/F  
**Location:** 88 Greencastle Road  
Kilkeel  
Newry  
Co. Down  
BT34 4ST

**Proposal:**

Change of house type and garage together with relocation of garage previously approved under planning reference LA07/2018/0097/F

Thank you for your consultation on the above which was received by the Department on 04/08/2022.

This letter provides a single combined response for your consultation request across all of DAERA's area of environmental responsibility. Summary comments in relation to the reason for consultation are provided in the table below at Annex A, and, where appropriate, more detailed advice is enclosed and attached to this letter.

You should be aware that, in the absence of comment, no inference can be made on DAERA's position with regard to other environmental matters. It is the responsibility of the planning authority to ensure that all risks to the environment and requirements under environmental legislation and planning policy have been considered.

*Sustainability at the heart of a living, working, active landscape valued by everyone.*

If you are deaf or have a hearing difficulty you can contact the Department via the Next Generation Text Relay Service by dialling 18001 + telephone number.



This advice and guidance will enable you to identify and consider if there are other potential risks to the environment due to impacts from the construction and operation of the proposed development and also its location.

In addition, we would also refer you to DAERA's published advice and guidance on development proposals where there is potential for effects on the natural and marine environments and fisheries interests, available at: <https://www.daera-ni.gov.uk/topics/environmental-advice-planning>.

As the Planning Authority is the competent authority under The Conservation (Natural Habitats, etc.) Regulations 1995 (as amended), this responsibility extends to the carrying out of Habitat Regulations Assessments (HRAs) before a planning decision is made.

Should you require assistance or if you wish to discuss anything further, please do not hesitate to contact the Planning Response Team using the contact details below.

Kind regards.

**Planning Response Team**

**On behalf of DAERA**

**Email: [planningresponse.team@daera-ni.gov.uk](mailto:planningresponse.team@daera-ni.gov.uk)**

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If you are deaf or have a hearing difficulty you can contact the Department via the Next Generation Text Relay Service by dialling 18001 + telephone number.



## Annex A

Advice Provided By:	Summary
Regulation Unit	Regulation Unit Land and Groundwater Team note the history of land filling on site and adjacent. RU further note however that the proposed development is for a single dwelling and relocation of a garage and is therefore considered to be a low risk to the water environment. RU would have no objection to any planning application subject to the recommended Conditions and Informatives as detailed.

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If you are deaf or have a hearing difficulty you can contact the Department via the Next Generation Text Relay Service by dialling 18001 + telephone number.



## Regulation Unit

**Planning Reference:** LA07/2022/0885/F

**Location:** 88 Greencastle Road Kilkeel Newry Co. Down BT34 4ST

### Considerations

**Regulation Unit (RU) Land and Groundwater Team note the history of landfilling on site and adjacent. RU further note however that the proposed development is for a single dwelling and relocation of a garage and is therefore considered to be a low risk to the water environment. RU would have no objection to any planning application subject to the recommended Conditions and Informatives as detailed below.**

### Explanatory note

1. The priority of RU in assessing this application is to consider the potential for contamination to be present at the site that could impact on environmentally sensitive receptors including groundwater and surface water. However, it should be noted that Newry, Mourne and Down District Council is the authoritative body with respect to environmental health matters and we would ask that you ensure they have an opportunity to comment on all relevant information.
2. Regulation Unit (RU) Land and Groundwater Team note the history of landfilling on site and adjacent. RU further note however that the proposed development is for a single dwelling and relocation of a garage and is therefore considered to be a low risk to the water environment due to the small scale. RU would have no objection to any planning application subject to the recommended Conditions and Informatives as detailed below.
3. Further guidance and information is available and the applicant should consult the Environmental Advice for Planners guidance available at:  
<https://www.daera-ni.gov.uk/topics/environmental-advice-planning>  
<https://www.daera-ni.gov.uk/articles/contaminated-land>  
This provides guidance as to what specific information is required for a given development type and includes 'The Practice Guide – Re-developing land affected by contamination' that includes detail on required reports and minimum reporting requirements etc.

### Conditions

Wording for proposed conditions concerning the management of land contamination are provided below and should you wish to discuss or have further clarity then do not hesitate to get in touch with the Regulation Unit (RU) Land and Groundwater Team.

- 1. If during the development works, new contamination or risks are encountered which have not previously been identified, works should cease and the Planning Authority shall be notified immediately. This new contamination shall be fully investigated in accordance with the Land Contamination: Risk Management (LCRM) guidance. In the event of unacceptable risks being identified, a Remediation Strategy shall be agreed with the Planning Authority in writing, and subsequently implemented and verified to its satisfaction. This strategy should be completed by competent persons in accordance with the Land Contamination: Risk Management (LCRM) guidance.**

## Regulation Unit

**Reason: Protection of environmental receptors to ensure the site is suitable for use.**

2. **After completing the remediation works under Condition 1 and prior to occupation of the development, a Verification Report needs to be submitted in writing and agreed with Planning Authority. This report should be completed by competent persons in accordance with the Land Contamination: Risk Management (LCRM) guidance. The Verification Report should present all the remediation and monitoring works undertaken and demonstrate the effectiveness of the works in managing all the risks and achieving the remedial objectives.**

**Reason: Protection of environmental receptors to ensure the site is suitable for use.**

### Informatives

1. The purpose of Conditions 1 and 2 are to ensure that the site risk assessment and remediation work is undertaken to a standard that enables safe development and end-use of the site such that it would not be determined as contaminated land under the forthcoming Contaminated Land legislation i.e. Part 3 of the Waste and Contaminated Land Order (NI) 1997. It remains the responsibility of the developer to undertake and demonstrate that the works have been effective in managing all risks.
2. The applicant should ensure that the management of all waste materials onto and off this site are suitably authorised through the Waste and Contaminated Land (Northern Ireland) Order 1997, the Waste Management Licensing Regulations (Northern Ireland) 2003 and the Water Order (Northern Ireland) 1999. Further information can be obtained from:  
<https://www.daera-ni.gov.uk/articles/waste-management-licensing>  
<https://www.daera-ni.gov.uk/topics/waste/waste-management-licensing-exemptions>  
<https://www.daera-ni.gov.uk/articles/regulating-water-discharges>
3. RU recommend that the applicant consult with the Water Management Unit within the NIEA regarding any potential dewatering that may be required during the redevelopment works including the need for discharge consent. Discharged waters should meet appropriate discharge consent Conditions.



## **APPENDIX C: SITE WALKOVER PHOTOGRAPHS**

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**PHOTOGRAPHIC LOG**

<b>Photo no.</b>	<b>Date:</b>
1	09/11/23



**Description:**  
New dwelling under construction (looking south)

<b>Photo No.</b>	<b>Date:</b>
2	09/11/23




**Description:**  
New double garage under construction (looking south)


<b>Photo No.</b> 3	<b>Date:</b> 09/11/23	
<b>Description:</b> Shed building no. 1 (looking east)		

<b>Photo No.</b> 4	<b>Date:</b> 09/11/23	
<b>Description:</b> Shed building no. 2 (looking south)		

<b>Photo No.</b> 5	<b>Date:</b> 09/11/23	
<b>Description:</b> Western site boundary marked by a steep bank (looking north)		

<b>Photo No.</b> 6	<b>Date:</b> 09/11/23	
<b>Description:</b> Land to north of site – former landfill (looking north)		

<b>Photo No.</b> 7	<b>Date:</b> 09/11/23	
<b>Description:</b> North eastern part of site with 84 Greencastle Road in background (looking north east)		

<b>Photo No.</b> 8	<b>Date:</b> 09/11/23	
<b>Description:</b> Steep bank separating the south western part of the site from the lower lying north eastern area (looking south)		



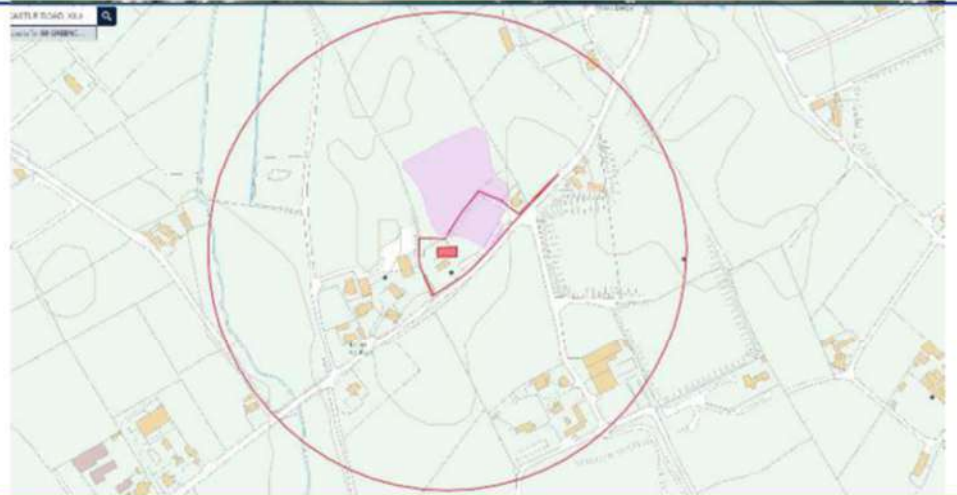
## **APPENDIX D: EXTRACT FROM TABLE 2 IN GROUND CHECK LTD'S PRA REPORT**

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**OSNI Spatial  
Mapviewer  
(c.2023)**

- No apparent land-use changes – as reflected by Orthophotograph c.2023. Location of new house is shown as shaded red block.

- No apparent land-use changes – as reflected by Orthophotograph c.2023
- Extents of historical landfill reflected by Planning Portal Map (P/1989/0602) reflected by PINK SHADED AREA (NIEA Industrial ID 22361.00).





## **APPENDIX E: BOREHOLE LOGS**

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# Borehole Log

Location ID:

**BH01**

Page 1/2

Date Start: 11/08/2023	Location Type: Undefined	Project ID: 23-3287	Project Name: Preliminary Risk Assessment	Easting: 329304	Northing: 312809
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Date Finish: 11/08/2023	Logged By: S. Thompson	Site Location: 88 Greencastle Road, Kilkeel, Co. Down	Elevation: 34.09(m) OD
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Samples & In-situ Testing		Results & Information	Wells	Water	Legend	Stratum Description	Scale	Depth (m)	Reduced Level (m)
Type	Depth (m)								
ES	0.50					Greyish brown and brownish grey, clayey, very silty, sandy, fine to coarse, angular to sub-angular GRAVEL with occasional pieces of concrete, wood and cinder. Sand is fine to coarse. [MADE GROUND]			
ES	1.00							1.0	

Continued on Next Page

Water Monitoring		Water Strikes			Shift Information				Depth Related Remarks			Backfill		
Depth	Date	Struck	Date	Flow	Depth	Water	Remarks	Date Time	Top	Base	Remarks	Top	Base	Type
					3.00		DRY	11/08/2023 16:30	0.00	1.20	Obstruction time - Hand dug inspection pit.	0.00	0.20	
												0.20	0.50	
												0.50	3.00	

Termination Reason: Virtual refusal to boring.	General Remarks:		Scale: 1:10
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# Borehole Log

Location ID:

**BH01**

Page 2/2

Date Start: 11/08/2023	Location Type: Undefined	Project ID: 23-3287	Project Name: Preliminary Risk Assessment	Easting: 329304	Northing: 312809
Date Finish: 11/08/2023	Logged By: S. Thompson	Site Location: 88 Greencastle Road, Kilkeel, Co. Down		Elevation: 34.09(m) OD	

Samples & In-situ Testing		Results & Information	Wells	Water	Legend	Stratum Description	Scale	Depth (m)	Reduced Level (m)
Type	Depth (m)								
ES	2.00					Greyish brown and brownish grey, clayey, very silty, sandy, fine to coarse, angular to sub-angular GRAVEL with occasional pieces of concrete, wood and cinder. Sand is fine to coarse. [MADE GROUND]	2.0	2.00	32.09
ES	3.00					Dark brownish grey, gravelly, very sandy, slightly organic, clayey SILT. Sand is fine to coarse. Gravel is fine to coarse, sub-angular. [MADE GROUND]	3.0	3.00 3.00	31.09 31.09
[OBSTRUCTION]						End of Borehole at 3.00m			

Water Monitoring		Water Strikes			Shift Information				Depth Related Remarks			Backfill		
Depth	Date	Struck	Date	Flow	Depth	Water	Remarks	Date Time	Top	Base	Remarks	Top	Base	Type
					3.00		DRY	11/08/2023 16:30				0.00	0.20	
												0.20	0.50	
												0.50	3.00	

Termination Reason: Virtual refusal to boring.	General Remarks:		Scale: 1:10
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# Borehole Log

Location ID:

**BH02**

Page 1/2

Date Start: 11/08/2023	Location Type: Undefined	Project ID: 23-3287	Project Name: Preliminary Risk Assessment	Easting: 329326	Northing: 312821
Date Finish: 11/08/2023	Logged By: S. Thompson	Site Location: 88 Greencastle Road, Kilkeel, Co. Down		Elevation: 33.91(m) OD	

Samples & In-situ Testing		Results & Information	Wells	Water	Legend	Stratum Description	Scale	Depth (m)	Reduced Level (m)
Type	Depth (m)								
ES	0.50					Light brownish grey, silty, sandy, fine to coarse, angular to sub-angular GRAVEL containing broken concrete. Sand is fine to coarse. [MADE GROUND]		0.30	33.61
ES	1.00					Light greyish brown, mottled orange brown, in pockets grey, gravelly, sandy, clayey SILT with occasional pieces of wood, glass and plastic. Sand is fine to medium. Gravel is fine to coarse, sub-angular to sub-rounded. [MADE GROUND]		1.0	
						Greyish brown and brownish grey, gravelly, sandy, organic, clayey SILT containing plywood, plastic, paper and tile. Sand is fine to coarse, gravel is fine to coarse, sub-angular. [MADE GROUND]		1.50	32.41

Continued on Next Page

Water Monitoring		Water Strikes			Shift Information				Depth Related Remarks			Backfill		
Depth	Date	Struck	Date	Flow	Depth	Water	Remarks	Date Time	Top	Base	Remarks	Top	Base	Type
					3.50		DRY	11/08/2023 16:30	0.00	1.20	Obstruction time - Hand dug inspection pit.	0.00	0.20	
												0.20	0.50	
												0.50	3.50	

Termination Reason: Virtual refusal to boring.	General Remarks:		Scale: 1:10
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# Borehole Log

Location ID:

**BH02**

Page 2/2

Date Start: 11/08/2023	Location Type: Undefined	Project ID: 23-3287	Project Name: Preliminary Risk Assessment	Easting: 329326	Northing: 312821
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Date Finish: 11/08/2023	Logged By: S. Thompson	Site Location: 88 Greencastle Road, Kilkeel, Co. Down	Elevation: 33.91(m) OD
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Samples & In-situ Testing		Results & Information	Wells	Water	Legend	Stratum Description	Scale	Depth (m)	Reduced Level (m)
Type	Depth (m)								
ES	2.00					Greyish brown and brownish grey, gravelly, sandy, organic, clayey SILT containing plywood, plastic, paper and tile. Sand is fine to coarse. gravel is fine to coarse, sub-angular. [MADE GROUND]		2.0	
ES	3.00							3.0	
ES	3.50					[OBSTRUCTION]		3.50	30.41
						End of Borehole at 3.50m		3.50	30.41

Water Monitoring		Water Strikes			Shift Information				Depth Related Remarks			Backfill		
Depth	Date	Struck	Date	Flow	Depth	Water	Remarks	Date Time	Top	Base	Remarks	Top	Base	Type
					3.50		DRY	11/08/2023 16:30				0.00	0.20	
												0.20	0.50	
												0.50	3.50	

Termination Reason: Virtual refusal to boring.	General Remarks:		Scale: 1:10
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# Borehole Log

Location ID:

**BH03**

Page 1/1

Date Start: 11/08/2023	Location Type: Undefined	Project ID: 23-3287	Project Name: Preliminary Risk Assessment	Easting: 329339	Northing: 312808
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Date Finish: 11/08/2023	Logged By: S. Thompson	Site Location: 88 Greencastle Road, Kilkeel, Co. Down	Elevation: 34.32(m) OD
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Samples & In-situ Testing		Results & Information	Wells	Water	Legend	Stratum Description	Scale	Depth (m)	Reduced Level (m)
Type	Depth (m)								
ES	0.50					Grey, slightly silty, sandy, fine to coarse, angular GRAVEL. Sand is fine to coarse. [MADE GROUND?]		0.20	34.12
						Light greyish brown, slightly mottled orange brown and light grey, gravelly, very sandy, clayey SILT containing cobbles. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded. [MADE GROUND?]		0.60	33.72
ES	1.00					Light greyish brown, gravelly, very sandy, clayey SILT containing cobbles. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded. [GLACIAL?]		1.00	
ES	1.60					[COBBLES/BOULDER?] End of Borehole at 1.60m		1.60	32.72

Water Monitoring		Water Strikes			Shift Information				Depth Related Remarks			Backfill		
Depth	Date	Struck	Date	Flow	Depth	Water	Remarks	Date Time	Top	Base	Remarks	Top	Base	Type
					1.60		DRY	11/08/2023 16:30	0.00	1.20	Obstruction time - Hand dug inspection pit.	0.00	0.20	
												0.20	0.50	
												0.50	1.60	

Termination Reason: Virtual refusal to boring.	General Remarks:		Scale: 1:10
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# Borehole Log

Location ID:

**BH04**

Page 1/1

Date Start: 11/08/2023	Location Type: Undefined	Project ID: 23-3287	Project Name: Preliminary Risk Assessment	Easting: 329317	Northing: 312800
Date Finish: 11/08/2023	Logged By:	Site Location: 88 Greencastle Road, Kilkeel, Co. Down		Elevation: 34.40(m) OD	

Samples & In-situ Testing		Results & Information	Wells	Water	Legend	Stratum Description	Scale	Depth (m)	Reduced Level (m)
Type	Depth (m)								
ES	0.50				[MADE GROUND]	Grey, slightly sandy, fine to coarse angular GRAVEL (Hardcore). Sand is fine to coarse. [MADE GROUND]		0.10	34.30
ES	1.00				[GLACIAL]	Light greyish brown, gravelly, very sandy, clayey SILT containing cobbles. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded. [GLACIAL]		1.00	
					[COBBLES/BOULDER?]	End of Borehole at 1.10m		1.10	33.30

Water Monitoring		Water Strikes			Shift Information				Depth Related Remarks			Backfill		
Depth	Date	Struck	Date	Flow	Depth	Water	Remarks	Date Time	Top	Base	Remarks	Top	Base	Type
					1.10		DRY	01/01/2020 16:30	0.00	1.20	Obstruction time - Hand dug inspection pit.			

Termination Reason: Virtual refusal to boring.	General Remarks:		Scale: 1:10
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# Borehole Log

Location ID:

**BH05**

Page 1/1

Date Start: 24/10/2023	Location Type: Undefined	Project ID: 23-3287	Project Name: Preliminary Risk Assessment	Easting: 329397	Northing: 312858
Date Finish: 24/10/2023	Logged By:	Site Location: 88 Greencastle Road, Kilkeel, Co. Down		Elevation: 29.80(m) OD	

Samples & In-situ Testing		Results & Information	Wells	Water	Legend	Stratum Description	Scale	Depth (m)	Reduced Level (m)	
Type	Depth (m)									
ES	0.50					Reworked TOPSOIL with cobbles and occasional pieces of broken crockery.[]		0.10	29.70	
								Dark greyish brown, gravelly, sandy, slightly clayey SILT with cobbles and occasional pieces of broken brick. Gravel is fine to coarse sub-angular. Sand is fine to coarse. [MADE GROUND]	0.30	29.50
								Firm to stiff, dark orange brown to reddish brown, gravelly, very sandy, clayey SILT with cobbles. Gravel is fine to coarse sub-rounded. Sand is fine to coarse. [GLACIAL]		
ES	1.00					End of Borehole at 1.00m		1.00	28.80	

Water Monitoring		Water Strikes			Shift Information				Depth Related Remarks			Backfill		
Depth	Date	Struck	Date	Flow	Depth	Water	Remarks	Date Time	Top	Base	Remarks	Top	Base	Type
					1.00		DRY	01/01/2020 16:30						

Termination Reason: Hand Auger Borehole	General Remarks:		Scale: 1:10
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# Borehole Log

Location ID:

**BH06**

Page 1/1

Date Start: 24/10/2023	Location Type: Undefined	Project ID: 23-3287	Project Name: Preliminary Risk Assessment	Easting: 329389	Northing: 312867
Date Finish: 24/10/2023	Logged By:	Site Location: 88 Greencastle Road, Kilkeel, Co. Down		Elevation: 29.90(m) OD	

Samples & In-situ Testing		Results & Information	Wells	Water	Legend	Stratum Description	Scale	Depth (m)	Reduced Level (m)
Type	Depth (m)								
ES	0.50				[Pattern]	Reworked TOPSOIL with cobbles and occasional pieces of broken crockery.[]		0.30	29.60
ES	1.00				[Pattern]	Firm to stiff, dark orange brown to reddish brown, gravelly, very sandy, clayey SILT with cobbles. Gravel is fine to coarse sub-rounded. Sand is fine to coarse. [GLACIAL]		1.00	28.90
						End of Borehole at 1.00m		1.00	28.90

Water Monitoring		Water Strikes			Shift Information				Depth Related Remarks			Backfill		
Depth	Date	Struck	Date	Flow	Depth	Water	Remarks	Date Time	Top	Base	Remarks	Top	Base	Type
					1.00		DRY	01/01/2020 16:30						

Termination Reason: Hand Auger Borehole	General Remarks:		Scale: 1:10
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# APPENDIX F: SOIL LABORATORY ANALYSIS RESULTS

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# Final Report

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**Report No.:** 23-35917-1

**Initial Date of Issue:** 10-Nov-2023

**Re-Issue Details:**

**Client** Ground Check Ltd

**Client Address:** 70A Old Mill Industrial Estate  
 Muckamore  
 Antrim  
 County Antrim  
 BT41 4QE

**Contact(s):** Rodger Wells  
 S Thompson

**Project** 23-3287 Greencastle Road, Kilkeel

**Quotation No.:** **Date Received:** 26-Oct-2023

**Order No.:** **Date Instructed:** 27-Oct-2023

**No. of Samples:** 6

**Turnaround (Wkdays):** 5 **Results Due:** 02-Nov-2023

**Date Approved:** 10-Nov-2023

**Approved By:**



**Details:** Stuart Henderson, Technical  
 Manager

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## Results - Soil

**Project: 23-3287 Greencastle Road, Kilkeel**

Client: Ground Check Ltd		Chemtest Job No.:		23-35917	23-35917	23-35917	23-35917	23-35917	23-35917
Quotation No.:		Chemtest Sample ID.:		1722757	1722758	1722759	1722760	1722761	1722762
Sample Location:		BH01	BH02	BH03	BH05	BH04	BH06		
Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Top Depth (m):		0.50	0.50	0.50	0.50	1.00	0.50		
Date Sampled:		25-Oct-2023	25-Oct-2023	25-Oct-2023	25-Oct-2023	25-Oct-2023	25-Oct-2023		
Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY		
Determinand	Accred.	SOP	Units	LOD					
ACM Type	U	2192		N/A	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	12	8.7	8.4	8.3	11
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones and Roots	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand
Arsenic	U	2455	mg/kg	0.5	180	20	4.0	6.4	3.3
Cadmium	U	2455	mg/kg	0.10	4.5	0.89	< 0.10	0.20	< 0.10
Chromium	U	2455	mg/kg	0.5	110	50	20	26	27
Copper	U	2455	mg/kg	0.50	1000	110	20	44	9.4
Mercury	U	2455	mg/kg	0.05	0.16	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	180	46	17	24	22
Lead	U	2455	mg/kg	0.50	460	52	18	58	9.9
Selenium	U	2455	mg/kg	0.25	2.2	0.94	0.45	0.35	0.45
Zinc	U	2455	mg/kg	0.50	1400	170	44	90	39
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	U	2690	mg/kg	2.00	< 2.0	2.2	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16	U	2690	mg/kg	1.00	1.8	3.4	< 1.0	< 1.0	< 1.0
Aliphatic EPH >C16-C21	U	2690	mg/kg	2.00	3.2	2.5	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C21-C35	U	2690	mg/kg	3.00	17	15	43	9.6	< 3.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10	18	< 10	< 10
Total Aliphatic EPH >C10-C35	U	2690	mg/kg	5.00	24	23	43	9.6	< 5.0
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	24	23	61	< 10	< 10
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	< 2.0	< 2.0	5.1	5.8	5.7
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	62	11	43	15	< 2.0
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	21	7.5	29	5.3	1.4

## Results - Soil

**Project: 23-3287 Greencastle Road, Kilkeel**

Client: Ground Check Ltd		Chemtest Job No.: 23-35917											
Quotation No.:		Chemtest Sample ID.:											
Sample Location:		BH01		BH02		BH03		BH05		BH04		BH06	
Sample Type:		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
Top Depth (m):		0.50		0.50		0.50		0.50		1.00		0.50	
Date Sampled:		25-Oct-2023		25-Oct-2023		25-Oct-2023		25-Oct-2023		25-Oct-2023		25-Oct-2023	
Asbestos Lab:		COVENTRY		COVENTRY		COVENTRY		COVENTRY		COVENTRY		COVENTRY	
Determinand	Accred.	SOP	Units	LOD									
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	64	11	48	21	6.6	8.6			
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	85	18	77	26	< 10	< 10			
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
Total EPH >C10-C35	U	2690	mg/kg	10.00	87	34	91	30	< 10	11			
Total EPH >C10-C40	N	2690	mg/kg	10.00	110	41	140	35	< 10	12			
Organic Matter	U	2625	%	0.40	6.2	< 0.40	< 0.40	2.9	2.1	2.4			
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Phenanthrene	U	2700	mg/kg	0.10	0.11	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Fluoranthene	U	2700	mg/kg	0.10	0.26	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Pyrene	U	2700	mg/kg	0.10	0.36	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Chrysene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0			

## Test Methods

SOP	Title	Parameters included	Method summary
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection

## **Report Information**

### **Key**

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U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

### **Sample Deviation Codes**

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- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

### **Sample Retention and Disposal**

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All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

[customerservices@chemtest.com](mailto:customerservices@chemtest.com)



## **APPENDIX G: GROUND GAS MONITORING DATA**

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Project ID		Project Title		Date								
23-3287		Residential Dwelling		28/08/2023								
Monitoring Visit		Project Location										
01		88 Greencastle Road, Kilkeel										
Gas Monitoring - Recording Sheet												
Location ID	Time Start 24h	Atmospheric Pressure mbar	Flow Peak l/hr	Flow Steady l/hr	Time Elapsed s	CH <sub>4</sub> % vol	CH <sub>4</sub> % LEL	CO <sub>2</sub> % vol	O <sub>2</sub> % vol	CO ppm	H <sub>2</sub> S ppm	PID ppm
BH01	12:20:00	1004	0	0	15	0.0	0.0	0.5	20.6	0.0	0.0	0 Dry
					30	0.0	0.0	0.2	20.8	0.0	0.0	
					60	0.0	0.0	0.2	20.8	0.0	0.0	
					90	0.0	0.0	0.1	20.8	0.0	0.0	
					120	0.0	0.0	0.1	20.8	0.0	0.0	
					150	0.0	0.0	0.1	20.8	0.0	0.0	
180	0.0	0.0	0.1	20.8	0.0	0.0						
BH02	12:10:00	1004	0	0	15	0.4	0.0	0.7	16.7	0.0	0.0	0 Dry
					30	1.0	34.7	3.4	10.2	0.0	0.0	
					60	2.0	45.3	7.9	4.7	0.0	0.0	
					90	2.6	66.5	16.5	0.0	0.0	0.0	
					120	2.8	67.0	17.5	0.0	0.0	0.0	
					150	2.9	67.7	18.0	0.0	0.0	0.0	
180	2.9	67.9	18.9	0.0	0.0	0.0						
BH03	12:30:00	1004	0	0	15	0.0	0.0	2.4	16.6	0.0	0.0	0 Dry
					30	0.0	0.0	3.2	14.9	0.0	0.0	
					60	0.0	0.0	3.9	13.9	0.0	0.0	
					90	0.0	0.0	4.0	13.7	0.0	0.0	
					120	0.0	0.0	4.1	13.7	0.0	0.0	
					150	0.0	0.0	4.1	13.6	0.0	0.0	
180	0.0	0.0	4.1	13.6	0.0	0.0						

Project ID		Project Title		Date								
23-3287		Residential Dwelling		06/09/2023								
Monitoring Visit		Project Location		88 Greencastle Road, Kilkeel								
02												
Gas Monitoring - Recording Sheet												
Location ID	Time Start 24h	Atmospheric Pressure mbar	Flow Peak l/hr	Flow Steady l/hr	Time Elapsed s	CH <sub>4</sub> % vol	CH <sub>4</sub> % LEL	CO <sub>2</sub> % vol	O <sub>2</sub> % vol	CO ppm	H <sub>2</sub> S ppm	PID ppm
BH01	09:40:00	1013	0	0	15	0.0	0.0	0.3	20.6	0.0	0.0	0 Dry
					30	0.0	0.0	0.3	20.6	0.0	0.0	
					60	0.0	0.0	0.3	20.6	0.0	0.0	
					90	0.0	0.0	0.3	20.6	0.0	0.0	
					120	0.0	0.0	0.3	20.6	0.0	0.0	
					150	0.0	0.0	0.4	20.5	0.0	0.0	
180	0.0	0.0	0.4	20.5	0.0	0.0						
BH02	09:30:00	1014	0	0	15	1.3	31.0	14.7	9.7	0.0	0.0	0 Dry
					30	1.4	33.7	17.2	3.2	0.0	0.0	
					60	1.7	39.2	18.5	0.7	0.0	0.0	
					90	1.7	40.4	18.8	0.0	0.0	0.0	
					120	1.8	41.1	18.9	0.0	0.0	0.0	
					150	1.8	41.4	18.9	0.0	0.0	0.0	
180	1.9	41.5	18.9	0.0	0.0	0.0						
BH03	09:20:00	1013	0	0	15	0.0	0.0	3.6	19.6	0.0	0.0	0 Dry
					30	0.0	0.0	4.4	14.0	0.0	0.0	
					60	0.0	0.0	4.6	13.3	0.0	0.0	
					90	0.0	0.0	4.7	13.1	0.0	0.0	
					120	0.0	0.0	4.7	13.0	0.0	0.0	
					150	0.0	0.0	4.7	13.0	0.0	0.0	
180	0.0	0.0	4.7	12.9	0.0	0.0						

Project ID		Project Title		Date								
23-3287		Residential Dwelling		12/09/2023								
Monitoring Visit		Project Location										
03		88 Greencastle Road, Kilkeel										
Gas Monitoring - Recording Sheet												
Location ID	Time Start 24h	Atmospheric Pressure mbar	Flow Peak l/hr	Flow Steady l/hr	Time Elapsed s	CH <sub>4</sub> % vol	CH <sub>4</sub> % LEL	CO <sub>2</sub> % vol	O <sub>2</sub> % vol	CO ppm	H <sub>2</sub> S ppm	PID ppm
BH01	09:40:00	1014	0	0	15	0.0	0.0	6.5	14.6	0.0	0.0	0 Dry
					30	0.0	0.0	6.7	12.2	0.0	0.0	
					60	0.0	0.0	6.8	11.3	0.0	0.0	
					90	0.0	0.0	6.9	11.1	0.0	0.0	
					120	0.0	0.0	8.0	10.7	0.0	0.0	
					150	0.0	0.0	8.2	10.0	0.0	0.0	
BH02	09:50:00	1014	0	0	15	0.7	18.5	4.8	6.7	0.0	0.0	0 Dry
					30	0.8	20.1	15.2	0.5	0.0	0.0	
					60	0.9	21.0	18.6	0.0	0.0	0.0	
					90	0.9	21.4	18.9	0.0	0.0	0.0	
					120	1.0	22.6	19.0	0.0	0.0	0.0	
					150	1.0	23.9	19.1	0.0	0.0	0.0	
BH03	10:00:00	1013	0	0	15	0.0	0.0	5.2	14.4	0.0	0.0	0 Dry
					30	0.0	0.0	5.3	14.0	0.0	0.0	
					60	0.0	0.0	5.3	14.0	0.0	0.0	
					90	0.0	0.0	5.3	13.9	0.0	0.0	
					120	0.0	0.0	5.3	13.9	0.0	0.0	
					150	0.0	0.0	5.3	13.9	0.0	0.0	
					180	0.0	0.0	5.3	13.9	0.0	0.0	

Project ID		Project Title		Date								
23-3287		Residential Dwelling		15/09/2023								
Monitoring Visit		Project Location										
04		88 Greencastle Road, Kilkeel										
Gas Monitoring - Recording Sheet												
Location ID	Time Start 24h	Atmospheric Pressure mbar	Flow Peak l/hr	Flow Steady l/hr	Time Elapsed s	CH <sub>4</sub> % vol	CH <sub>4</sub> % LEL	CO <sub>2</sub> % vol	O <sub>2</sub> % vol	CO ppm	H <sub>2</sub> S ppm	PID ppm
BH01	09:20:00	1009	0	0	15	0.0	0.0	0.8	20.3	0.0	0.0	0.0 Dry
					30	0.0	0.0	0.8	19.8	0.0	0.0	
					60	0.0	0.0	0.8	19.7	0.0	0.0	
					90	0.0	0.0	0.8	19.7	0.0	0.0	
					120	0.0	0.0	0.9	19.6	0.0	0.0	
					150	0.0	0.0	0.9	19.5	0.0	0.0	
BH02	09:30:00	1009	0	0	15	1.7	36.0	17.8	7.5	0.0	0.0	0.0 Dry
					30	1.7	40.9	18.6	0.0	0.0	0.0	
					60	1.8	41.5	18.9	0.0	0.0	0.0	
					90	1.8	41.8	19.1	0.0	0.0	0.0	
					120	1.8	42.3	19.2	0.0	0.0	0.0	
					150	1.8	42.7	19.2	0.0	0.0	0.0	
BH03	09:40:00	1010	0	0	15	0.0	0.0	4.5	17.1	0.0	0.0	0.0 Dry
					30	0.0	0.0	4.8	14.9	0.0	0.0	
					60	0.0	0.0	4.8	14.7	0.0	0.0	
					90	0.0	0.0	4.7	14.7	0.0	0.0	
					120	0.0	0.0	4.7	14.6	0.0	0.0	
					150	0.0	0.0	4.7	14.6	0.0	0.0	
180	0.0	0.0	4.7	14.6	0.0	0.0						

Project ID		Project Title		Date								
23-3287		Residential Dwelling		19/09/2023								
Monitoring Visit		Project Location		88 Greencastle Road, Kilkeel								
05												
Gas Monitoring - Recording Sheet												
Location ID	Time Start 24h	Atmospheric Pressure mbar	Flow Peak l/hr	Flow Steady l/hr	Time Elapsed s	CH <sub>4</sub> % vol	CH <sub>4</sub> % LEL	CO <sub>2</sub> % vol	O <sub>2</sub> % vol	CO ppm	H <sub>2</sub> S ppm	PID ppm
BH01	09:20:00	988	0	0	15	0.0	0.0	4.4	13.0	0.0	0.0	0 Dry
					30	0.0	0.0	10.4	10.2	0.0	0.0	
					60	0.0	0.0	10.7	9.9	0.0	0.0	
					90	0.0	0.0	10.8	9.8	0.0	0.0	
					120	0.0	0.0	11.0	9.7	0.0	0.0	
					150	0.0	0.0	11.4	9.6	0.0	0.0	
BH02	09:30:00	987	0	0	15	2.0	42.2	7.2	5.6	0.0	0.0	0 Dry
					30	2.2	50.4	17.1	0.4	0.0	0.0	
					60	2.3	53.9	18.1	0.0	0.0	0.0	
					90	2.4	55.8	18.7	0.0	0.0	0.0	
					120	2.4	56.4	18.9	0.0	0.0	0.0	
					150	2.4	56.5	19.0	0.0	0.0	0.0	
BH03	09:40:00	986	-5.4	0	15	0.0	0.0	4.9	15.7	0.0	0.0	0 Dry
					30	0.0	0.0	5.3	13.1	0.0	0.0	
					60	0.0	0.0	5.4	13.0	0.0	0.0	
					90	0.0	0.0	5.5	12.9	0.0	0.0	
					120	0.0	0.0	5.5	12.9	0.0	0.0	
					150	0.0	0.0	5.5	12.8	0.0	0.0	
					180	0.0	0.0	5.5	12.8	0.0	0.0	

Project ID		Project Title		Date								
23-3287		Residential Dwelling		24/10/2023								
Monitoring Visit		Project Location										
06		88 Greencastle Road, Kilkeel										
Gas Monitoring - Recording Sheet												
Location ID	Time Start	Atmospheric Pressure	Flow Peak	Flow Steady	Time Elapsed	CH <sub>4</sub>	CH <sub>4</sub>	CO <sub>2</sub>	O <sub>2</sub>	CO	H <sub>2</sub> S	PID
BH01	14:30:00	991 (Falling)	0	0	15	3.1	76.7	15.2	4.0	0.0	0.0	0 Dry
					30	4.0	94.5	14.6	3.3	0.0	0.0	
					60	4.3	100.0	15.8	2.1	0.0	0.0	
					90	4.5	100.0	17.2	0.4	0.0	0.0	
					120	4.4	100.0	18.1	0.0	0.0	0.0	
					150	4.4	99.9	18.5	0.0	0.0	0.0	
BH02	14:20:00	992	0	0	15	3.0	67.5	17.5	10.5	0.0	0.0	0 Dry
					30	3.2	75.9	18.3	0.0	0.0	0.0	
					60	3.3	76.7	18.4	0.0	0.0	0.0	
					90	3.4	77.7	18.4	0.0	0.0	0.0	
					120	3.4	78.3	18.5	0.0	0.0	0.0	
					150	3.4	79.1	18.5	0.0	0.0	0.0	
BH03	14:10:00	994	0	0	15	0.0	0.0	4.5	14.5	0.0	0.0	0 Dry
					30	0.0	0.0	6.6	10.5	0.0	0.0	
					60	0.0	0.0	6.8	10.0	0.0	0.0	
					90	0.0	0.0	6.9	9.9	0.0	0.0	
					120	0.0	0.0	6.9	9.8	0.0	0.0	
					150	0.0	0.0	7.0	9.8	0.0	0.0	
					180	0.0	0.0	7.0	9.8	0.0	0.0	



## **APPENDIX H: GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH**

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## Generic assessment criteria for human health: residential scenario with home-grown produce

### Background

RSK's generic assessment criteria (GAC) were initially prepared following the publication by the Environment Agency (EA) of soil guideline value (SGV) and toxicological (TOX) reports, and associated publications in 2009<sup>(1)</sup>. RSK GAC were updated following the publication of GAC by LQM/CIEH in 2009<sup>(2)</sup>. RSK GAC are periodically revised when updated information on toxicological, land use or receptor parameters is published.

### Updates to the RSK GAC

In 2014, the publication of Category 4 Screening Levels (C4SL)<sup>(3,4)</sup>, as part of the Defra-funded research project SP1010, included modifications to certain exposure assumptions documented within EA Science Report SC050221/SR3 (herein after referred to as SR3)<sup>(5)</sup> used in the generation of SGVs.

C4SL were initially published for six substances (cadmium, arsenic, benzene, benzo(a)pyrene, chromium VI and lead) for a sandy loam soil type with 6% soil organic matter, based on a low level of toxicological concern (LLTC; see Section 2.3 of research project report SP1010<sup>(3)</sup>). Further C4SL were published in 2021 for vinyl chloride, tetrachloroethene (PCE) and trichloroethene (TCE). Where a C4SL has been published, the RSK GAC duplicates the C4SL using all input parameters within the SP1010 final project report<sup>(3)</sup> and associated chemical specific reports<sup>(6)</sup>, and adopts them as GAC for these substances. Due to the use of decimal places rather than significant figures applied to the Contaminated Land Exposure Assessment (CLEA) tool outputs, the GAC presented may be marginally differently to the C4SL values, however any differences between the values are minimal and would not equate to an unacceptable risk.

For all other substances the C4SL exposure modifications, with the exception of the “top two” produce type approach taken in the C4SL, have been applied to the current RSK GAC. These include alterations to daily inhalation rates for residential and commercial scenarios, reducing soil adherence factors in children (age classes 1 to 12 only) for residential land use, reducing exposure frequency for dermal contact outdoors for residential land use, and updated produce type consumption rates (90<sup>th</sup> percentile) based on recent data from the National Diet and Nutrition Survey.

The RSK GAC have also been revised with updated toxicology published by LQM/CIEH in 2015<sup>(7)</sup> or by the USEPA<sup>(14)</sup>, where a C4SL has not been published.

### RSK GAC derivation for metals and organic compounds

#### *Model selection*

Soil assessment criteria (SAC) were calculated using the CLEA tool v1.071, supporting EA guidance<sup>(5,8,9)</sup> and revised exposure scenarios published for the C4SL<sup>(3)</sup>. The SAC are also termed GAC.

### *Conceptual model*

In accordance with SR3<sup>(5)</sup>, the residential with home-grown produce scenario considers risks to a female child between the ages of 0 and 6 years old as the highest risk scenario. In accordance with Box 3.1 of SR3<sup>(5)</sup>, the pathways considered for production of the SAC in the residential with home-grown produce scenario are

- direct soil and dust ingestion
- consumption of home-grown produce
- consumption of soil attached to home-grown produce
- dermal contact with soil and indoor dust
- inhalation of indoor and outdoor dust and vapours.

Figure 1 is a conceptual model illustrating these linkages.

In line with guidance in the EA SGV report for cadmium<sup>(1)</sup>, the RSK GAC for cadmium has been derived based on estimates representative of lifetime exposure. Although young children are generally more likely to have higher exposures to soil contaminants, the renal toxicity of cadmium, and the derivation of the TDI<sub>oral</sub> and TDI<sub>inh</sub>, are based on considerations of the kidney burden accumulated over 50 years or so. It is therefore reasonable to consider exposure not just in childhood but averaged over a longer period.

With respect to volatilisation, the CLEA model assumes a simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase<sup>(9)</sup>. The upper boundaries of this partitioning are represented by the maximum aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA model estimates saturated soil concentrations where these limits are reached<sup>(9)</sup>. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous- or vapour-based soil saturation limits. Model output cells are flagged red where the saturated soil concentration has been exceeded and the contribution of the indoor and outdoor vapour pathway to total exposure is greater than 10%. In this case, further consideration of the following is required<sup>(9)</sup>:

- Free phase contamination may be present.
- Exposure from the vapour pathways will be over-predicted by the model, as in reality the vapour phase concentration will not increase at concentrations above saturation limits
- Where the vapour pathway contribution is greater than 90%, it is unlikely the relevant health criteria value (HCV) will be exceeded at soil concentrations at least a factor of ten higher than the relevant HCV.

Where the vapour pathway is the predominant pathway (contributes greater than 90% of exposure) or the only exposure route considered and the cell is highlighted red (SAC exceeds saturation limit), the risk based on the assumed conceptual model is likely to be negligible as the vapour risk is assumed to be tolerable at maximum possible soil concentrations. In such circumstances, the vapour pathway exposure should be considered based on the presence of free phase or non-aqueous phase liquid sources and the measured concentrations of volatile organic compounds (VOC) in the vapour phase. Screening could be considered based on setting the SAC as the modelled soil saturation limits. However, as stated within the CLEA handbook<sup>(9)</sup>, this is likely to not be practical in many cases because of the very low saturation limits and, in any case, is highly conservative.

It should also be noted that for mixtures of compounds, free phase may be present where soil (or groundwater) concentrations are well below saturation limits for individual compounds.

Where the vapour pathway is only one of the exposure pathways considered, an additional approach can then be utilised as detailed within Section 4.12 of the CLEA model handbook<sup>(9)</sup>, which explains how to calculate an effective assessment criterion manually.

SR3<sup>(5)</sup> states that, as a general rule of thumb, it is recognised that estimating vapour phase concentrations from dissolved and sorbed phase contamination by petroleum hydrocarbons are at least a factor of ten higher than those likely to be measured on-site. RSK has therefore applied an empirical subsurface to indoor air correction factor of 10 into the CLEA model chemical database for all petroleum hydrocarbon fractions (including BTEX, trimethylbenzenes and the polycyclic aromatic hydrocarbons (PAH) naphthalene, acenaphthene and acenaphthylene) to reduce this conservatism.

### *Input selection*

The most up-to-date published chemical and toxicological data was obtained from EA Report SC050021/SR7<sup>(10)</sup>, the EA TOX<sup>(1)</sup> reports, the C4SL SP1010 project report and associated appendices<sup>(3,6)</sup>, the 2015 LQM/CIEH report<sup>(7)</sup> or the USEPA IRIS database<sup>(14)</sup>. Where a LLTC<sup>(3,6)</sup> has been published for a substance, RSK has used these input parameters to derive the RSK GAC. Toxicological and specific chemical parameters for 1,2,4-trimethylbenzene, barium, methyl tertiary-butyl ether (MTBE), 1,1,2-trichloroethane, 1,1-dichloroethene, 1,2-dichloropropane, 2-chloronaphthalene, chloroethane, chloromethane, cis 1,2-dichloroethene, dichloromethane, hexachloroethane and trans 1,2-dichloroethene were obtained from the CL:AIRE Soil Generic Assessment Criteria report<sup>(11)</sup>.

For TPH, aromatic hydrocarbons C<sub>5</sub>–C<sub>8</sub> were not modelled, as this range comprises benzene (>EC5-EC7) and toluene (>EC7-EC8), which are modelled separately.

### *Physical parameters*

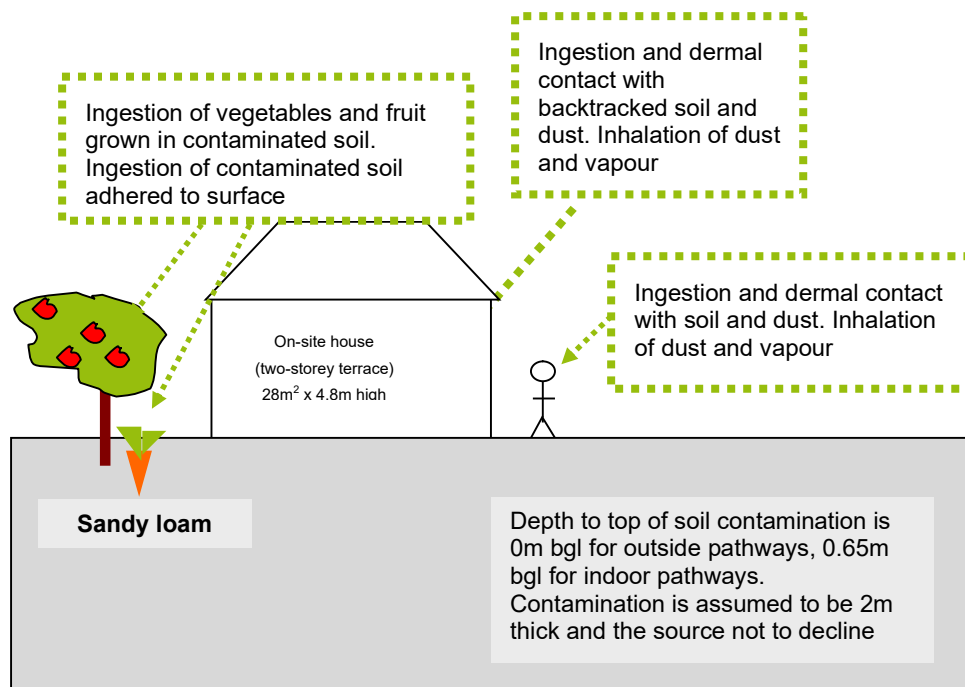
For the residential with home-grown produce scenario, the CLEA default building is a small, two-storey terrace house with a concrete ground-bearing slab. The house is assumed to have a 100m<sup>2</sup> private garden consisting of lawn and flowerbeds, incorporating a 20m<sup>2</sup> plot for growing fruit and vegetables consumed by the residents. SR3<sup>(5)</sup> notes this residential building type to be the most conservative in terms of potential for vapour intrusion. The building parameters used in the production of the RSK GACs are the default CLEA v1.06 inputs presented in Table 3.3 of SR3<sup>(3)</sup>, with a dust loading factor detailed in Section 9.3 of SR3<sup>(5)</sup>. The parameters for a sandy loam soil type were used in line with Table 4.4 of SR3<sup>(5)</sup>. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for SOM, RSK has produced an additional set of GAC for SOM of 1% and 2.5% for all substances using the CLEA tool.

### *Summary of modifications to the default CLEA SR3<sup>(5)</sup> input parameters for residential with home-grown produce land-use scenario*

In summary, the RSK GAC were produced using the default input parameters for soil properties, the air dispersion model, building properties and the vapour model detailed in SR3<sup>(5)</sup>. Modifications to the default SR3<sup>(5)</sup> exposure scenarios based on the C4SL exposure scenarios<sup>(3)</sup> are presented in Tables 2 and 3 below.

The final selected GAC are presented by pathway in Table 4 and the combined GAC in Table 5.

**Figure 1: Conceptual model for residential scenario with home-grown produce**



**Table 1: Exposure assessment parameters for residential scenario with home-grown produce – inputs for CLEA model**

Parameter	Value	Justification
Land use	Residential with homegrown produce	Chosen land use
Receptor	Female child age 1 to 6	Key generic assumption given in Box 3.1, SR3 <sup>(5)</sup>
Building	Small terraced house	Key generic assumption given in Box 3.1, SR3. Small, two-storey terraced house chosen, as it is the most conservative residential building type in terms of protection from vapor intrusion (Section 3.4.6, SR3) <sup>(5)</sup>
Soil type	Sandy Loam	Most common UK soil type (Section 4.3.1, from Table 3.1, SR3) <sup>(5)</sup>
Start AC (age class)	1	Range of age classes corresponding to key generic assumption that the critical receptor is a young female child aged 0–6. From Box 3.1, SR3 <sup>(5)</sup>
End AC (age class)	6	
SOM (%)	6	Representative of sandy loamy soil according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents' <sup>(13)</sup>
	1	To provide SAC for sites where SOM <6% as often observed by RSK
	2.5	
pH	7	Model default

**Table 2: Residential with home-grown produce – modified home-grown produce data**

Name	Consumption rate 90 <sup>th</sup> percentile (g FW kg <sup>-1</sup> BW day <sup>-1</sup> ) by age class						Dry weight conversion factor (g DW g <sup>-1</sup> FW)	Home-grown fraction (average)	Home-grown fraction (high end)	Soil loading factor (g g <sup>-1</sup> DW)	Preparation correction factor
	1	2	3	4	5	6					
Green vegetables	7.12	5.87	5.87	5.87	4.53	4.53	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	10.7	2.83	2.83	2.83	2.14	2.14	0.103	0.06	0.4	1.00E-03	1.00E+00
Tuber vegetables	16	6.6	6.6	6.6	4.95	4.95	0.21	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	1.83	3.39	3.39	3.39	2.24	2.24	0.058	0.06	0.4	1.00E-03	6.00E-01
Shrub fruit	2.23	0.46	0.46	0.46	0.19	0.19	0.166	0.09	0.6	1.00E-03	6.00E-01
Tree fruit	3.82	10.3	10.3	10.3	5.16	5.16	0.157	0.04	0.27	1.00E-03	6.00E-01
Justification	Table 3.4, SP1010 <sup>(3)</sup>						Table 6.3, SR3 <sup>(5)</sup>	Table 4.19, SR3 <sup>(5)</sup>		Table 6.3, SR3 <sup>(5)</sup>	

**Table 3: Residential with home-grown produce – modified and use and receptor data**

Parameter	Unit	Age class					
		1	2	3	4	5	6
EF (soil and dust ingestion)	day yr <sup>-1</sup>	180	365	365	365	365	365
EF (consumption of home-grown produce)	day yr <sup>-1</sup>	180	365	365	365	365	365
EF (skin contact, indoor)	day yr <sup>-1</sup>	180	365	365	365	365	365
EF (skin contact, outdoor)	day yr <sup>-1</sup>	170	170	170	170	170	170
EF (inhalation of dust and vapour, indoor)	day yr <sup>-1</sup>	365	365	365	365	365	365
EF (inhalation of dust and vapour, outdoor)	day yr <sup>-1</sup>	365	365	365	365	365	365
Justification	Table 3.5, SP1010 <sup>(3)</sup> ; Table 3.1, SR3 <sup>(5)</sup>						
Soil to skin adherence factor (outdoor)	mg cm <sup>-2</sup> day <sup>-1</sup>	0.1	0.1	0.1	0.1	0.1	0.1
Justification	Table 3.5, SP1010 <sup>(3)</sup>						
Inhalation rate	m <sup>3</sup> day <sup>-1</sup>	5.4	8.0	8.9/f	10.1	10.1	10.1
Justification	Mean value USEPA, 2011 <sup>(12)</sup> ; Table 3.2, SP1010 <sup>(3)</sup>						
Notes: For <b>cadmium</b> , the exposure assessment for a residential land use is based on estimates representative of lifetime exposure AC1-18. This is because the TDI <sub>oral</sub> and TDI <sub>inh</sub> are based on considerations of the kidney burden accumulated over 50 years. It is therefore reasonable to consider exposure not just in childhood but averaged over a longer period. See the Environment Agency Science Report SC05002/ TOX 3 <sup>(1)</sup> , Science Report SC050021/Cadmium SGV <sup>(1)</sup> and the project report SP1010 <sup>(3)</sup> for more information.							

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GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE



Table 4  
Human Health Generic Assessment Criteria by Pathway for Residential With Home-Grown Produce Scenario

Compound	Notes	SAC Appropriate to Pathway SOM 1% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 2.5% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation Limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
<b>Metals</b>													
Arsenic	(a,b)	3.71E+01	5.26E+02	NR	NR	3.71E+01	5.26E+02	NR	NR	3.71E+01	5.26E+02	NR	NR
Barium	(b)	1.34E+03	NR	NR	NR	1.34E+03	NR	NR	NR	1.34E+03	NR	NR	NR
Beryllium		1.13E+02	1.72E+00	NR	NR	1.13E+02	1.72E+00	NR	NR	1.13E+02	1.72E+00	NR	NR
Boron		3.00E+02	5.20E+06	NR	NR	3.00E+02	5.20E+06	NR	NR	3.00E+02	5.20E+06	NR	NR
Cadmium	(a)	2.30E+01	4.88E+02	2.21E+01	NR	2.30E+01	4.88E+02	2.21E+01	NR	2.30E+01	4.88E+02	2.21E+01	NR
Chromium (III) - trivalent	(c)	1.84E+04	9.07E+02	NR	NR	1.84E+04	9.07E+02	NR	NR	1.84E+04	9.07E+02	NR	NR
Chromium (VI) - hexavalent	(a,d)	5.85E+01	2.06E+01	NR	NR	5.85E+01	2.06E+01	NR	NR	5.85E+01	2.06E+01	NR	NR
Copper		2.72E+03	1.41E+04	2.47E+03	NR	2.72E+03	1.41E+04	2.47E+03	NR	2.72E+03	1.41E+04	2.47E+03	NR
Lead	(a)	2.01E+02	NR	NR	NR	2.01E+02	NR	NR	NR	2.01E+02	NR	NR	NR
Elemental Mercury (Hg <sup>0</sup> )	(d)	NR	2.35E-01	NR	4.31E+00	NR	5.60E-01	NR	1.07E+01	NR	1.22E+00	NR	2.58E+01
Inorganic Mercury (Hg <sup>2+</sup> )		3.95E+01	3.63E+03	3.91E+01	NR	3.95E+01	3.63E+03	3.91E+01	NR	3.95E+01	3.63E+03	3.91E+01	NR
Methyl Mercury (Hg <sup>+</sup> )		1.26E+01	1.87E+01	7.52E+00	7.33E+01	1.26E+01	3.62E+01	9.34E+00	1.42E+02	1.26E+01	7.68E+01	1.08E+01	3.04E+02
Nickel	(d)	1.27E+02	1.81E+02	NR	NR	1.27E+02	1.81E+02	NR	NR	1.27E+02	1.81E+02	NR	NR
Selenium	(b)	2.58E+02	NR	NR	NR	2.58E+02	NR	NR	NR	2.58E+02	NR	NR	NR
Vanadium		4.13E+02	1.46E+03	NR	NR	4.13E+02	1.46E+03	NR	NR	4.13E+02	1.46E+03	NR	NR
Zinc	(b)	3.86E+03	3.63E+07	NR	NR	3.86E+03	3.63E+07	NR	NR	3.86E+03	3.63E+07	NR	NR
Cyanide (free)		1.37E+00	1.37E+04	1.37E+00	NR	1.37E+00	1.37E+04	1.37E+00	NR	1.37E+00	1.37E+04	1.37E+00	NR
<b>Volatile Organic Compounds</b>													
Benzene	(a)	2.62E-01	9.01E-01	2.03E-01	1.22E+03	5.39E-01	1.68E+00	4.08E-01	2.26E+03	1.16E+00	3.48E+00	8.72E-01	4.71E+03
Toluene		1.53E+02	9.08E+02	1.31E+02	8.69E+02	3.49E+02	2.00E+03	2.97E+02	1.92E+03	7.95E+02	4.55E+03	6.77E+02	4.36E+03
Ethylbenzene		1.10E+02	8.34E+01	4.74E+01	5.18E+02	2.61E+02	1.96E+02	1.12E+02	1.22E+03	6.00E+02	4.58E+02	2.60E+02	2.84E+03
Xylene - m		2.10E+02	8.25E+01	5.92E+01	6.25E+02	5.01E+02	1.95E+02	1.40E+02	1.47E+03	1.15E+03	4.56E+02	3.27E+02	3.46E+03
Xylene - o		1.92E+02	8.87E+01	6.07E+01	4.78E+02	4.56E+02	2.08E+02	1.43E+02	1.12E+03	1.05E+03	4.86E+02	3.32E+02	2.62E+03
Xylene - p		1.98E+02	7.93E+01	5.66E+01	5.76E+02	4.70E+02	1.86E+02	1.33E+02	1.35E+03	1.08E+03	4.36E+02	3.10E+02	3.17E+03
Total xylene		1.92E+02	7.93E+01	5.66E+01	6.25E+02	4.56E+02	1.86E+02	1.33E+02	1.47E+03	1.05E+03	4.36E+02	3.10E+02	3.46E+03
Methyl tertiary-Butyl ether (MTBE)		1.54E+02	1.04E+02	6.22E+01	2.04E+04	2.97E+02	1.69E+02	1.08E+02	3.31E+04	6.03E+02	3.21E+02	2.10E+02	6.27E+04
1,1,1,2-Tetrachloroethane		5.39E+00	1.54E+00	1.20E+00	2.60E+03	1.27E+01	3.56E+00	2.78E+00	6.02E+03	2.92E+01	8.29E+00	6.46E+00	1.40E+04
1,1,2,2-Tetrachloroethane		2.81E+00	3.92E+00	1.64E+00	2.67E+03	6.10E+00	8.04E+00	3.47E+00	5.46E+03	1.36E+01	1.76E+01	7.67E+00	1.20E+04
1,1,1-Trichloroethane		3.33E+02	9.01E+00	8.77E+00	1.43E+03	7.26E+02	1.84E+01	1.80E+01	2.92E+03	1.62E+03	4.04E+01	3.94E+01	6.39E+03
1,1,2 Trichloroethane		1.95E+00	1.25E+00	7.62E-01	4.03E+03	4.21E+00	2.55E+00	1.59E+00	8.21E+03	9.35E+00	5.59E+00	3.50E+00	1.80E+04
1,1-Dichloroethene		1.93E+01	3.29E-01	3.23E-01	2.23E+03	3.85E+01	5.82E-01	5.74E-01	3.94E+03	8.15E+01	1.17E+00	1.16E+00	7.94E+03
1,2-Dichloroethane		3.17E-02	9.20E-03	7.13E-03	3.41E+03	5.73E-02	1.33E-02	1.08E-02	4.91E+03	1.09E-01	2.28E-02	1.88E-02	8.43E+03
1,2,4-Trimethylbenzene		NR	1.76E+00	NR	4.74E+02	NR	4.26E+00	NR	1.16E+03	NR	9.72E+00	NR	2.76E+03
1,3,5-Trimethylbenzene	(e)	NR	NR	NR	2.30E+02	NR	NR	NR	5.52E+02	NR	NR	NR	1.30E+03
1,2-Dichloropropane		4.28E+00	3.40E-02	3.37E-02	1.19E+03	8.44E+00	6.00E-02	5.96E-02	2.11E+03	1.77E+01	1.21E-01	1.20E-01	4.24E+03
Carbon Tetrachloride (tetrachloromethane)		3.10E+00	2.58E-02	2.57E-02	1.52E+03	7.11E+00	5.65E-02	5.62E-02	3.32E+03	1.62E+01	1.28E-01	1.27E-01	7.54E+03
Chloroethane		NR	1.17E+01	NR	2.61E+03	NR	1.59E+01	NR	3.54E+03	NR	2.57E+01	NR	5.71E+03
Chloromethane		NR	1.17E-02	NR	1.91E+03	NR	1.38E-02	NR	2.24E+03	NR	1.85E-02	NR	2.99E+03
Cis 1,2 Dichloroethene		1.56E-01	NR	NR	3.94E+03	2.66E-01	NR	NR	6.61E+03	5.18E-01	NR	NR	1.29E+04
Dichloromethane		7.04E-01	3.05E+00	6.24E-01	7.27E+03	1.27E+00	4.06E+00	1.08E+00	9.68E+03	2.33E+00	6.42E+00	1.92E+00	1.53E+04
Tetrachloroethene (PCE)		1.33E+01	3.19E-01	3.11E-01	4.24E+02	3.11E+01	7.15E-01	6.99E-01	9.51E+02	7.12E+01	1.64E+00	1.60E+00	2.18E+03
Trans 1,2 Dichloroethene		6.45E+00	2.76E-01	NR	3.42E+03	1.29E+01	4.99E-01	NR	6.17E+03	2.74E+01	1.02E+00	NR	1.26E+04
Trichloroethene (TCE)		9.30E-03	3.61E-02	NR	1.54E+03	1.95E-02	7.57E-02	NR	3.22E+03	4.34E-02	1.68E-01	NR	7.14E+03
Vinyl Chloride (chloroethene)		1.13E-02	1.47E-02	6.38E-03	1.36E+03	2.09E-02	1.90E-02	9.97E-03	1.76E+03	3.88E-02	2.91E-02	1.66E-02	2.69E+03
<b>Semi-Volatile Organic Compounds</b>													
2-Chloronaphthalene		2.76E+02	5.39E+00	5.29E+00	1.14E+02	6.59E+02	1.33E+01	1.30E+01	2.80E+02	1.45E+03	3.17E+01	3.10E+01	6.69E+02

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE



Table 4  
Human Health Generic Assessment Criteria by Pathway for Residential With Home-Grown Produce Scenario

Compound	Notes	SAC Appropriate to Pathway SOM 1% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 2.5% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation Limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Acenaphthene		2.27E+02	4.86E+04	2.26E+02	5.70E+01	5.41E+02	1.18E+05	5.38E+02	1.41E+02	1.18E+03	2.68E+05	1.17E+03	3.36E+02
Acenaphthylene		1.85E+02	4.59E+04	1.84E+02	8.61E+01	4.42E+02	1.11E+05	4.40E+02	2.12E+02	9.78E+02	2.53E+05	9.74E+02	5.06E+02
Anthracene		2.43E+03	1.53E+05	2.39E+03	1.17E+00	5.53E+03	3.77E+05	5.45E+03	2.91E+00	1.10E+04	8.76E+05	1.09E+04	6.96E+00
Benzo(a)anthracene		1.01E+01	2.47E+01	7.18E+00	1.71E+00	1.42E+01	4.37E+01	1.07E+01	4.28E+00	1.69E+01	6.26E+01	1.33E+01	1.03E+01
Benzo(a)pyrene	(a)	4.96E+00	3.51E+01	NR	9.11E-01	4.96E+00	3.77E+01	NR	2.28E+00	4.96E+00	3.89E+01	NR	5.46E+00
Benzo(b)fluoranthene		2.96E+00	1.93E+01	2.56E+00	1.22E+00	3.89E+00	2.13E+01	3.29E+00	3.04E+00	4.43E+00	2.22E+01	3.69E+00	7.29E+00
Benzo(g,h,i)perylene		3.77E+02	1.87E+03	3.14E+02	1.54E-02	4.09E+02	1.94E+03	3.38E+02	3.85E-02	4.23E+02	1.97E+03	3.48E+02	9.23E-02
Benzo(k)fluoranthene		8.92E+01	5.41E+02	7.66E+01	6.87E-01	1.10E+02	5.76E+02	9.22E+01	1.72E+00	1.21E+02	5.91E+02	1.00E+02	4.12E+00
Chrysene		1.66E+01	1.19E+02	1.46E+01	4.40E-01	2.54E+01	1.49E+02	2.17E+01	1.10E+00	3.19E+01	1.66E+02	2.67E+01	2.64E+00
Dibenzo(a,h)anthracene		2.90E-01	1.45E+00	2.41E-01	3.93E-03	3.43E-01	1.64E+00	2.84E-01	9.82E-03	3.69E-01	1.74E+00	3.04E-01	2.36E-02
Fluoranthene		2.87E+02	3.83E+04	2.85E+02	1.89E+01	5.63E+02	8.87E+04	5.60E+02	4.73E+01	9.00E+02	1.83E+05	8.96E+02	1.13E+02
Fluorene		1.77E+02	6.20E+03	1.72E+02	3.09E+01	4.19E+02	1.53E+04	4.07E+02	7.65E+01	8.98E+02	3.62E+04	8.77E+02	1.83E+02
Hexachloroethane		2.68E-01	NR	NR	8.17E+00	6.57E-01	NR	NR	2.01E+01	1.55E+00	NR	NR	4.81E+01
Indeno(1,2,3-cd)pyrene		3.09E+01	2.12E+02	2.70E+01	6.13E-02	4.22E+01	2.38E+02	3.59E+01	1.53E-01	4.92E+01	2.50E+02	4.11E+01	3.68E-01
Naphthalene		2.78E+01	2.33E+01	1.27E+01	7.64E+01	6.66E+01	5.58E+01	3.04E+01	1.83E+02	1.53E+02	1.31E+02	7.06E+01	4.32E+02
Phenanthrene		9.85E+01	7.17E+03	9.72E+01	3.60E+01	2.24E+02	1.76E+04	2.22E+02	8.96E+01	4.48E+02	4.07E+04	4.43E+02	2.14E+02
Pyrene		6.25E+02	8.79E+04	6.20E+02	2.20E+00	1.25E+03	2.04E+05	1.24E+03	5.49E+00	2.05E+03	4.23E+05	2.04E+03	1.32E+01
Phenol		1.60E+02	4.58E+02	1.20E+02	2.42E+04	2.96E+02	6.95E+02	2.09E+02	3.81E+04	5.86E+02	1.19E+03	3.93E+02	7.03E+04
<b>Total Petroleum Hydrocarbons</b>													
Aliphatic hydrocarbons EC <sub>2</sub> -EC <sub>6</sub>		4.99E+03	4.24E+01	4.23E+01	3.04E+02	1.13E+04	7.79E+01	7.78E+01	5.58E+02	2.50E+04	1.61E+02	1.60E+02	1.15E+03
Aliphatic hydrocarbons >EC <sub>2</sub> -EC <sub>3</sub>		1.49E+04	1.04E+02	1.03E+02	1.44E+02	3.43E+04	2.31E+02	2.31E+02	3.22E+02	7.11E+04	5.29E+02	5.28E+02	7.36E+02
Aliphatic hydrocarbons >EC <sub>7</sub> -EC <sub>10</sub>		1.61E+03	2.68E+01	2.67E+01	7.77E+01	2.91E+03	6.55E+01	6.51E+01	1.90E+02	4.26E+03	1.56E+02	1.54E+02	4.51E+02
Aliphatic hydrocarbons >EC <sub>10</sub> -EC <sub>12</sub>		4.57E+03	1.33E+02	1.32E+02	4.75E+01	5.51E+03	3.31E+02	3.26E+02	1.18E+02	5.98E+03	7.93E+02	7.65E+02	2.83E+02
Aliphatic hydrocarbons >EC <sub>12</sub> -EC <sub>16</sub>		6.27E+03	1.11E+03	1.06E+03	2.37E+01	6.34E+03	2.78E+03	2.41E+03	5.91E+01	6.36E+03	6.67E+03	4.34E+03	1.42E+02
Aliphatic hydrocarbons >EC <sub>16</sub> -EC <sub>35</sub>	(b)	6.46E+04	NR	NR	8.48E+00	9.17E+04	NR	NR	2.12E+01	1.10E+05	NR	NR	5.09E+01
Aliphatic hydrocarbons >EC <sub>35</sub> -EC <sub>44</sub>	(b)	6.46E+04	NR	NR	8.48E+00	9.17E+04	NR	NR	2.12E+01	1.10E+05	NR	NR	5.09E+01
Aromatic hydrocarbons >EC8-EC <sub>10</sub>		5.76E+01	4.74E+01	3.45E+01	6.13E+02	1.38E+02	1.16E+02	8.38E+01	1.50E+03	3.07E+02	2.77E+02	1.94E+02	3.58E+02
Aromatic hydrocarbons >EC <sub>10</sub> -EC <sub>12</sub>		8.29E+01	2.58E+02	7.52E+01	3.64E+02	1.96E+02	6.39E+02	1.79E+02	8.99E+02	4.25E+02	1.52E+03	3.91E+02	2.15E+03
Aromatic hydrocarbons >EC <sub>12</sub> -EC <sub>16</sub>		1.47E+02	2.85E+03	1.45E+02	1.69E+02	3.36E+02	7.07E+03	3.32E+02	4.19E+02	6.81E+02	1.68E+04	6.74E+02	1.00E+03
Aromatic hydrocarbons >EC <sub>16</sub> -EC <sub>21</sub>	(b)	2.63E+02	NR	NR	5.37E+01	5.45E+02	NR	NR	1.34E+02	9.34E+02	NR	NR	3.21E+02
Aromatic hydrocarbons >EC <sub>21</sub> -EC <sub>35</sub>	(b)	1.09E+03	NR	NR	4.83E+00	1.47E+03	NR	NR	1.21E+01	1.70E+03	NR	NR	2.90E+01
Aromatic hydrocarbons >EC <sub>35</sub> -EC <sub>44</sub>	(b)	1.09E+03	NR	NR	4.83E+00	1.47E+03	NR	NR	1.21E+01	1.70E+03	NR	NR	2.90E+01

Notes:

EC - equivalent carbon. SAC - soil assessment criteria.

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded.

	Calculated SAC exceeds soil saturation limit and may significantly affect the interpretation of any exceedances as the contribution of the indoor and outdoor vapour pathway to total exposure is >10%.
	Calculated SAC exceeds soil saturation limit but the exceedance will not affect the SAC significantly as the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.
	Calculated SAC does not exceed the soil saturation limit.

The SAC for organic compounds are dependant upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, PAHs naphthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway (Section 10.1.1, SR3)

(a) SAC for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead are derived using the C4SL toxicology data.

(b) SAC for boron and selenium should not include the inhalation pathway as no expert group HCV has been derived; aliphatic and aromatic hydrocarbons >EC16 should not include inhalation pathway due to their non-volatile nature and inhalation exposure being minimal (oral, dermal and inhalation exposure is compared to the oral HCV); arsenic should only be based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report. The Oral SAC should be adopted for zinc and benzo(a)pyrene.

(c) SAC for CrIII should be based on the lower of the oral and inhalation SAC (see LQM/CIEH 2015 Section 6.8)

(d) SAC for elemental mercury, chromium VI and nickel should be based on the inhalation pathway only.

(e) SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4 trimethylbenzene may be used.

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE



**Table 5**  
Human Health Generic Assessment Criteria for Residential with home-grown produce

Compound	SAC for Soil SOM 1% (mg/kg)	SAC for Soil SOM 2.5% (mg/kg)	SAC for Soil SOM 6% (mg/kg)
<b>Metals</b>			
Arsenic	37	37	37
Barium	1,300	1,300	1,300
Beryllium	1.7	1.7	1.7
Boron	300	300	300
Cadmium	22	22	22
Chromium (III) - trivalent	910	910	910
Chromium (VI) - hexavalent	21	21	21
Copper	2,500	2,500	2,500
Lead	200	200	200
Elemental Mercury (Hg <sup>0</sup> )	0.2	0.6	1.2
Inorganic Mercury (Hg <sup>2+</sup> )	39	39	39
Methyl Mercury (Hg <sup>4+</sup> )	10	10	10
Nickel	130	130	130
Selenium	258	258	258
Vanadium	410	410	410
Zinc	3,900	3,900	3,900
Cyanide (free)	1.4	1.4	1.4
<b>Volatile Organic Compounds</b>			
Benzene	0.20	0.41	0.87
Toluene	130	300	680
Ethylbenzene	50	110	260
Xylene - m	59	140	327
Xylene - o	61	143	332
Xylene - p	57	133	310
Total xylene	57	133	310
Methyl tertiary-Butyl ether (MTBE)	60	110	210
1,1,1,2-Tetrachloroethane	1.20	2.78	6.46
1,1,2,2-Tetrachloroethane	1.6	3.5	7.7
1,1,1-Trichloroethane	9	18	39
1,1,2-Trichloroethane	0.8	1.6	3.5
1,1-Dichloroethane	0.32	0.57	1.16
1,2-Dichloroethane	0.007	0.011	0.019
1,2,4-Trimethylbenzene	1.8	4.3	9.7
1,3,5-Trimethylbenzene	NR	NR	NR
1,2-Dichloropropane	0.034	0.060	0.120
Carbon Tetrachloride (tetrachloromethane)	0.026	0.056	0.127
Chloroethane	11.7	15.9	25.7
Chloromethane	0.012	0.014	0.019
Cis 1,2-Dichloroethane	0.16	0.27	0.52
Dichloromethane	0.62	1.08	1.92
Tetrachloroethane (PCE)	0.31	0.70	1.60
Trans 1,2-Dichloroethane	0.28	0.50	1.02
Trichloroethane (TCE)	0.009	0.020	0.043
Vinyl Chloride (chloroethene)	0.006	0.010	0.017
<b>Semi-Volatile Organic Compounds</b>			
2-Chloronaphthalene	5	13	31
Acenaphthene	230	540	1,170
Acenaphthylene	180	440	970
Anthracene	2,400	5,500	10,900
Benzo(a)anthracene	7	11	13
Benzo(a)pyrene	5	5	5
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(g,h,i)perylene	310	340	350
Benzo(k)fluoranthene	77	92	100
Chrysene	15	22	27
Dibenzo(a,h)anthracene	0.24	0.28	0.30
Fluoranthene	290	560	900
Fluorene	170	410	880
Hexachloroethane	0.27	0.66	1.55
Indeno(1,2,3-cd)pyrene	13	30	71
Naphthalene	13	30	71
Phenanthrene	100	220	440
Pyrene	620	1,240	2,040
Phenol	120	210	390
<b>Total Petroleum Hydrocarbons</b>			
Aliphatic hydrocarbons EC <sub>7</sub> -EC <sub>5</sub>	42	78	160
Aliphatic hydrocarbons >EC <sub>6</sub> -EC <sub>9</sub>	100	230	530
Aliphatic hydrocarbons >EC <sub>8</sub> -EC <sub>10</sub>	27	65	154
Aliphatic hydrocarbons >EC <sub>10</sub> -EC <sub>12</sub>	130 (48)	330 (118)	760 (283)
Aliphatic hydrocarbons >EC <sub>12</sub> -EC <sub>16</sub>	1,100 (24)	2,400 (59)	4,300 (142)
Aliphatic hydrocarbons >EC <sub>16</sub> -EC <sub>35</sub>	65,000 (8)	92,000 (21)	110,000
Aliphatic hydrocarbons >EC <sub>35</sub> -EC <sub>44</sub>	65,000 (8)	92,000 (21)	110,000
Aromatic hydrocarbons >EC <sub>3</sub> -EC <sub>10</sub>	30	80	190
Aromatic hydrocarbons >EC <sub>10</sub> -EC <sub>12</sub>	80	180	390
Aromatic hydrocarbons >EC <sub>12</sub> -EC <sub>16</sub>	140	330	670
Aromatic hydrocarbons >EC <sub>16</sub> -EC <sub>21</sub>	260	540	930
Aromatic hydrocarbons >EC <sub>21</sub> -EC <sub>35</sub>	1,100	1,500	1,700
Aromatic hydrocarbons >EC <sub>35</sub> -EC <sub>44</sub>	1,100	1,500	1,700
<b>Minerals</b>			
Asbestos	Stage 1 test – No asbestos detected with ID; Stage 2 test - <0.001% dry weight (exceedance of either equates to an exceedance of the GAC) <sup>1</sup>		
<b>Notes:</b>			
* Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.			
NR - SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4-trimethylbenzene may be used			
EC - equivalent carbon. SAC - soil assessment criteria.			
<sup>1</sup> LOD for weight of asbestos per unit weight of soil calculated on a dry weight basis using PLM, handpicking and gravimetry.			
The SAC for organic compounds are dependent on Soil Organic Matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58.			
1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.			
SAC for TPH fractions, PAHs naphthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3.			
(VALUE IN BRACKETS)			
RSK has adopted an approach for petroleum hydrocarbons in accordance with LQM/ClEH whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the SAC with the corresponding solubility or vapour saturation limits given in brackets.			

# APPENDIX I: GROUND GAS ASSESSMENT METHODOLOGY

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## Appropriate guidance

The risks to development from ground gases have been assessed in accordance with BS8485:2015+A1:2019 (BS8485), which provides guidance on ground gas (methane and carbon dioxide) characterisation and hazard assessment, as well as providing a framework for the prescription of protection measures within new buildings.

The process involves characterising the gas hazard from combining the qualitative assessment of risk (using the CSM) with ground investigation data so that a 'characteristic situation' (CS) can be derived for the site or zones within the site. Characteristic situations range from CS1 to CS6, the higher the CS, the higher the hazard potential. Gas protection measures within new buildings can be prescribed using a point scoring system, taking into consideration the CS and the proposed building type.

For the purpose of this assessment, the empirical semi-quantitative approach above has been used to characterise the gas hazard and provide advice on the protective measures likely to be required within new buildings at the site, where necessary

## Empirical semi-quantitative approach using borehole monitoring data (Wilson and Card approach, BS8485)

The empirical semi quantitative approach using gas monitoring data requires the designation of a gas screening value (GSV) for the entire site or zones within the site, which informs the hazard potential and associated prescribed ground gas protection measures within new buildings (where necessary). BS8485 defines the GSV as the *'flow rate (l/hr) of a specific hazardous gas representative of a site or zone, derived from assessment of borehole concentration and flow rate measurements and taking account of all other influencing factors, in accordance with a conceptual site model'*.

BS8485 Section 6.3.1 outlines the process for developing a GSV for the site or a zone as follows:

- Borehole hazardous gas flow rate ( $Q_{hg}$ ) is calculated for each borehole standpipe for each monitoring event. The borehole hazardous gas flow rate is defined in BS8485 as the *'flow rate of a specific hazardous gas, either methane or carbon dioxide, from a borehole standpipe'*. The  $Q_{hg}$  is calculated from individual borehole measurements of total gas flow and the concentration of the specific hazardous gas. BS8485 states in Section 6.3.4 that the maximum gas concentration recorded during the monitoring event should be used, together with steady-state values of gas flows.
- The reliability of the measured gas flow rates and concentrations are assessed taking into account borehole construction.
- Decisions are made about how to deal with any temporal or spatial shortages in the data.
- Judgements are made about what GSV to designate for use for design purposes taking all relevant information and the conceptual site model into account.



Once the  $Q_{hg}$  has been calculated for methane and carbon dioxide, individual borehole measurements are compared to the thresholds presented in Table 2 of BS8485 which inform the CS that directly relates to each individual measurement. Taking into account the site data (i.e. borehole gas concentration and flow rate to calculate the  $Q_{hg}$ ) and all other influencing factors in accordance with the CSM, a decision can then be made regarding the GSV that is considered to be representative of the site or a zone within it.

Typical threshold concentrations of methane (1% v/v) and carbon dioxide (5% v/v), and flow rates (>70 l/h), are also considered when designating the GSV for the site or zone, which in turn dictates the hazard potential and CS. It is important to note that the site or zone characteristic GSV and maximum concentration or flow thresholds are guideline values and not absolute. The thresholds may be exceeded in certain circumstances, if the CSM indicates it is safe to do so.



## **APPENDIX J: GQRA DATA SCREENING TABLE – SOILS**

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Project name	88 Greencastle Road
Project code	604936
Client name	Mr. Roy Elliott
Address	
NGR	329325, 312821
Land use	Residential with home-grown produce
SOM	1%
GAC version	2021_00

Notes



Lab sample ID	1722757	1722758	1722759	1722761	1722760	1722762
Client sample ID	BH01	BH02	BH03	BH04	BH05	BH06
Depth to top	0.5	0.5	0.5	1	0.5	0.5
Depth to bottom						
Date sampled	25/10/23	25/10/23	25/10/23	25/10/23	25/10/23	25/10/23

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects										
<b>Metals and Inorganics</b>																		
Arsenic	mg/kg	37		180	3.3	6	6	0	180	20	4	3.3	6.4	3.5				
Cadmium	mg/kg	22		4.5	< 0.10	6	4	2	4.5	0.89	< 0.10	< 0.10	0.2	0.12				
Chromium	mg/kg	910	21	110	20	6	6	0	110	50	20	27	26	32				
Copper	mg/kg	2500		1000	9.4	6	6	0	1000	110	20	9.4	44	24				
Lead	mg/kg	200		460	9.9	6	6	0	460	52	18	9.9	58	16				
Mercury	mg/kg	39	0.2	0.16	< 0.05	6	1	5	0.16	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05				
Nickel	mg/kg	130		180	17	6	6	0	180	46	17	22	24	27				
Selenium	mg/kg	258		2.2	0.35	6	6	0	2.2	0.94	0.45	0.45	0.35	0.41				
Zinc	mg/kg	3900		1400	39	6	6	0	1400	170	44	39	90	50				
<b>Asbestos</b>																		
Asbestos in soil						6	0	6	NAD	NAD	NAD	NAD	NAD	NAD				
<b>Petroleum Hydrocarbons</b>																		
Ali >C5-C6	mg/kg	42			< 0.05	6	0	6	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05				
Ali >C6-C8	mg/kg	100			< 0.10	6	0	6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Ali >C8-C10	mg/kg	27			< 0.05	6	0	6	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05				
Ali >C10-C12	mg/kg	130	48	2.2	< 2.0	6	1	5	< 2.0	2.2	< 2.0	< 2.0	< 2.0	< 2.0				
Ali >C12-C16	mg/kg	1100	24	3.4	< 1.0	6	2	4	1.8	3.4	< 1.0	< 1.0	< 1.0	< 1.0				
Ali >C16-C21	mg/kg			3.2	< 2.0	6	2	4	3.2	2.5	< 2.0	< 2.0	< 2.0	< 2.0				
Ali >C21-C35	mg/kg			43	< 3.0	6	4	2	17	15	43	< 3.0	9.6	< 3.0				
Ali >C16-C35 calculated	mg/kg	65000	8	43	< 3.0	6	4	2	20.2	17.5	43	< 3.0	9.6	< 3.0				
Ali >C35-C40	mg/kg	65000	8	18	< 10	6	1	5	< 10	< 10	18	< 10	< 10	< 10				
Total Aliphatics	mg/kg			61	< 10	6	3	3	24	23	61	< 10	< 10	< 10				
Aro >C5-C7	mg/kg				< 0.05	6	0	6	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05				
Aro >C7-C8	mg/kg				< 0.05	6	0	6	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05				
Aro >C8-C10	mg/kg	30			< 0.05	6	0	6	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05				
Aro >C10-C12	mg/kg	80			< 1.0	6	0	6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aro >C12-C16	mg/kg	140			< 1.0	6	0	6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aro >C16-C21	mg/kg	260		5.9	< 2.0	6	4	2	< 2.0	< 2.0	5.1	5.7	5.8	5.9				
Aro >C21-C35	mg/kg	1100		62	< 2.0	6	5	1	62	11	43	< 2.0	15	2.7				
Aro >C35-C40	mg/kg	1100		29	1.1	6	6	0	21	7.5	29	1.4	5.3	1.1				
Total Aromatics	mg/kg			85	< 10	6	4	2	85	18	77	< 10	26	< 10				
TPH (Ali & Aro)	mg/kg			140	< 10	6	5	1	110	41	140	< 10	35	12				
<b>Polycyclic aromatic hydrocarbons</b>																		
Acenaphthene	mg/kg	230			< 0.10	6	0	6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Acenaphthylene	mg/kg	180			< 0.10	6	0	6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Anthracene	mg/kg	2400			< 0.10	6	0	6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Benzo(a)anthracene	mg/kg	7			< 0.10	6	0	6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Benzo(a)pyrene	mg/kg	5			< 0.10	6	0	6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Benzo(b)fluoranthene	mg/kg	2.6			< 0.10	6	0	6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Benzo(ghi)perylene	mg/kg	310			< 0.10	6	0	6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Benzo(k)fluoranthene	mg/kg	77			< 0.10	6	0	6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				

										Lab sample ID	1722757	1722758	1722759	1722761	1722760	1722762				
										Client sample ID	BH01	BH02	BH03	BH04	BH05	BH06				
										Depth to top	0.5	0.5	0.5	1	0.5	0.5				
										Depth to bottom										
										Date sampled	25/10/23	25/10/23	25/10/23	25/10/23	25/10/23	25/10/23				
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects												
Chrysene	mg/kg	15			< 0.10	6	0	6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10					
Dibenzo(ah)anthracene	mg/kg	0.24			< 0.10	6	0	6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10					
Fluoranthene	mg/kg	290		0.26	< 0.10	6	1	5	0.26	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10					
Fluorene	mg/kg	170			< 0.10	6	0	6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10					
Indeno(123-cd)pyrene	mg/kg	27			< 0.10	6	0	6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10					
Naphthalene	mg/kg	13			< 0.10	6	0	6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10					
Phenanthrene	mg/kg	100		0.11	< 0.10	6	1	5	0.11	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10					
Pyrene	mg/kg	620		0.36	< 0.10	6	1	5	0.36	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10					
Total PAH-16MS	mg/kg				< 2.0	6	0	6	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0					
Other analytes																				
Organic matter	% w/w			6.2	< 0.40	6	4	2	6.2	< 0.40	< 0.40	2.1	2.9	2.4						

## Notes for GQRA (soil) Screening Tool Output

1	Details of the <b>GAC (landuse, SOM and GAC version)</b> used in the GQRA are displayed at the top of the output screening sheet
2	Full details of the <b>GAC derivation</b> are included in a separate appendix document
3	The output screening sheet presents the reported Total Organic Carbon and the corresponding calculated Soil Organic Matter, using a conversion of TOC (%) divided by 0.58 to compute the SOM
4	Any laboratory results that are appended to the reported concentrations (e.g. Tentatively Identified Compounds, PAH Double Ratio Plots etc.) are not included in the output screening sheet.
<b>T1 First level screening threshold, equating to:</b>	
5	<div style="display: flex; align-items: flex-start;"> <div style="width: 20px; height: 15px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 20px; height: 15px; background-color: red; margin-right: 5px;"></div> <div> <p>Chromium: total Cr concentration compared to Cr VI (conservative assessment)</p> <p>Chromium: total Cr concentration compared to Cr III</p> <p><i>Comment</i> Where Cr VI has been reported, the CrVI results are compared directly to the CrVI GAC</p> </div> </div>
6	<div style="display: flex; align-items: flex-start;"> <div style="width: 20px; height: 15px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 20px; height: 15px; background-color: red; margin-right: 5px;"></div> <div> <p>Mercury : total Hg concentration compared to elemental Hg (conservative assessment)</p> <p>Mercury : total Hg concentration compared to inorganic Hg</p> <p><i>Comment</i> The tool does not screen against methyl mercury (this parameter is only reported if mercury has been speciated)</p> </div> </div>
7	<div style="display: flex; align-items: flex-start;"> <div style="width: 20px; height: 15px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 20px; height: 15px; background-color: red; margin-right: 5px;"></div> <div> <p>Petroleum Hydrocarbons: The soil saturation limit has been exceeded</p> <p>Petroleum Hydrocarbons: The modelled GAC has been exceeded</p> <p><i>Comment</i> RSK has adopted an approach for petroleum hydrocarbons whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the GAC with the corresponding solubility or vapour saturation limits given in brackets on the GAC appendix document. First level (T1) GQRA screening is against the soil saturation limit.</p> </div> </div>
8	<div style="display: flex; align-items: flex-start;"> <div style="width: 20px; height: 15px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 20px; height: 15px; background-color: red; margin-right: 5px;"></div> <div> <p>Free cyanide: Conservatively for sites where a child is the critical receptor, concentration compared to the SoBRA (2019) acute GAC for free CN</p> <p><i>Comment</i> Only applicable where the acute GAC of 24mg/kg for a child as the critical receptor is lower than the chronic GAC i.e. Residential without home-grown produce, POS Parks, POS Resi, Primary School and Secondary School land uses</p> </div> </div>
9	<div style="display: flex; align-items: flex-start;"> <div style="width: 20px; height: 15px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 20px; height: 15px; background-color: red; margin-right: 5px;"></div> <div> <p>Total cyanide: total CN compared to GAC for free CN or the SoBRA (2019) acute GAC for free CN (whichever is lowest)</p> <p><i>Comment</i> There is no GAC for total CN (risks are driven by free CN) therefore the first level GQRA screening is against free CN and no other screening is undertaken. For end uses where the critical receptor is a child the T1 is set at the acute GAC for free CN. Only applicable where the acute GAC of 24mg/kg is lower than the chronic GAC. The assumption that cyanide total comprises 100% free CN is conservative and consideration should be made on the suitability of this GAC based on the CSM.</p> </div> </div>
10	<div style="display: flex; align-items: flex-start;"> <div style="width: 20px; height: 15px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 20px; height: 15px; background-color: red; margin-right: 5px;"></div> <div> <p>Any analyte: First level screening threshold (T1) or GAC may be exceeded (e.g. lab results include a &lt; or &gt; symbol)</p> </div> </div>
11	The GQRA screening for <b>asbestos</b> is in relation to presence or absence ('detect'). Presence is reported as asbestos type or quantification >0.001%. Absence is reported as < limit of quantification of 0.001% or No Asbestos Detected (NAD).
12	Where <u>individual</u> reported concentrations are presented in grey (not black) font, the result was below the laboratory method detection limit.
13	Where cells are shaded grey, <u>all</u> results for that analyte are below the laboratory method detection limit



## **APPENDIX K: RADON RISK REPORT**

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Address searched: 88 Greencastle Road, Newry, BT34 4JL

Date of report: 10 November 2023

## **Guidance for existing properties**

### **Is this property in a radon Affected Area? - Yes**

A radon Affected Area is defined as where the radon level in at least one property in every hundred is estimated to exceed the Action Level.

### **The estimated probability of the property being above the Action Level for radon is: 5-10%**

The probability result is only valid for properties above ground. All basement and cellar areas are considered to be at additional risk from high radon levels.

The result may not be valid for buildings larger than 25 metres.

If this site is for redevelopment, you should undertake a GeoReport provided by the British Geological Survey.

This report informs you of the estimated probability that this particular property is above the Action Level for radon. This does not necessarily mean there is a radon problem in the property; the only way to find out whether it is above or below the Action Level is to carry out a radon measurement in an existing property.

Radon Affected Areas are designated by the UK Health Security Agency. UKHSA advises that radon gas should be measured in all properties within Radon Affected Areas.

If you are buying a currently occupied property in a Radon Affected Area, you should ask the present owner whether radon levels have been measured in the property. If they have, ask whether the results were above the Radon Action Level and if so, whether remedial measures were installed, radon levels were re-tested, and the results of re-testing confirmed the effectiveness of the measures.

Further information is available from UKHSA or <https://www.ukradon.org>

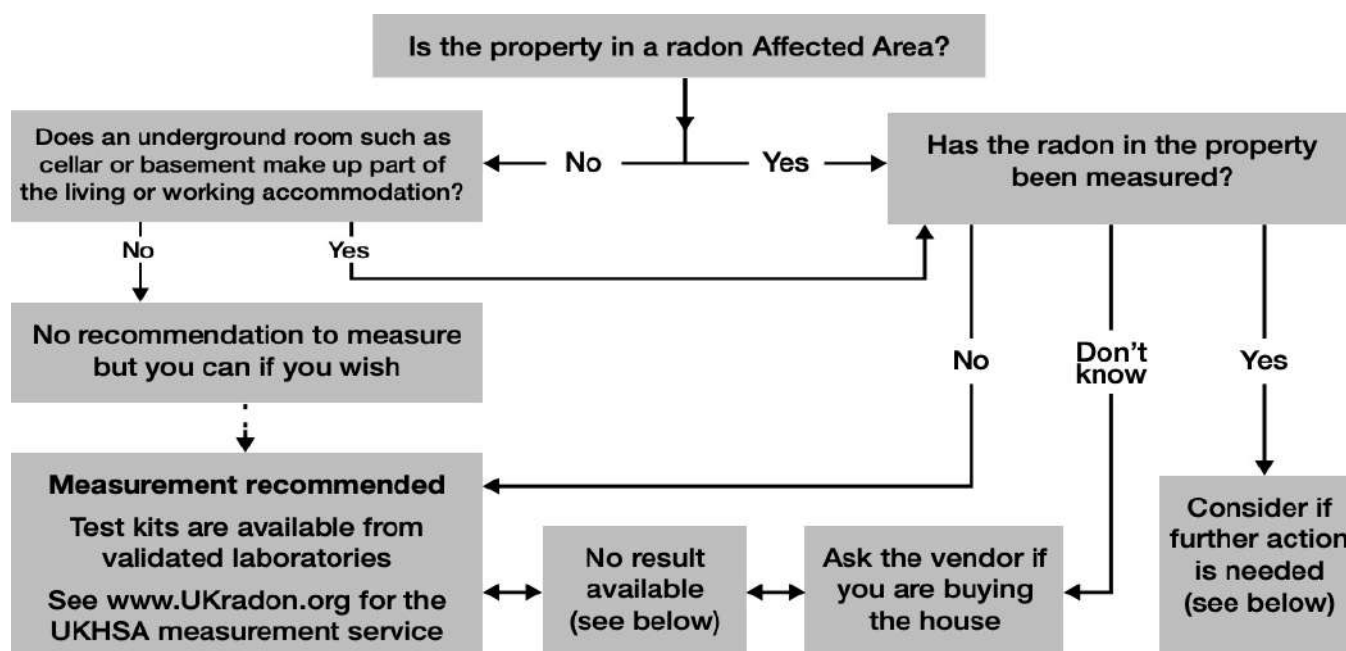
## **Guidance for new buildings and extensions to existing properties**

### **What is the requirement under Building Regulations for radon protection in new buildings and extensions at the property location? - Basic Protection**

If you are buying a new property in a Radon Affected Area, you should ask the builder whether radon protective measures were incorporated in the construction of the property.

See the Radon and Building Regulations for more details.

## UKHSA guidance for occupiers and prospective purchases



**Existing radon test results:** There is no public record of individual radon measurements. Results of previous tests can only be obtained from the seller. Radon levels can be significantly affected by changes to the building or its use, particularly by alterations to the heating and ventilation which can also be affected by changes in occupier. If in doubt, test again for reassurance.

**Radon Bond:** This is simply a retained fund, the terms of which are negotiated between the purchaser and the vendor. It allows the conveyance of the property to proceed without undue delay. The purchaser is protected against the possible cost of radon reduction work and the seller does not lose sale proceeds if the result is low. Make sure the agreement allows enough time to complete the test, get the result and arrange the work if needed.

**High Results:** Exposure to high levels of radon increases the risk of developing lung cancer. If a test in a home gives a result at or above the Action Level of 200 Becquerels per cubic metre of air (Bq/m<sup>3</sup>), formal advice will be given to lower the level. Radon reduction will also be recommended if the occupants include smokers or ex-smokers when the radon level is at or above the Target Level of 100 Bq/m<sup>3</sup>; these groups have a higher risk. Information on health risks and radon reduction work is available from UKHSA. Guidance about radon reduction work is also available from some Local Authorities, the Building Research Establishment and specialist contractors.

UKHSA designated radon website: <https://www.ukradon.org>

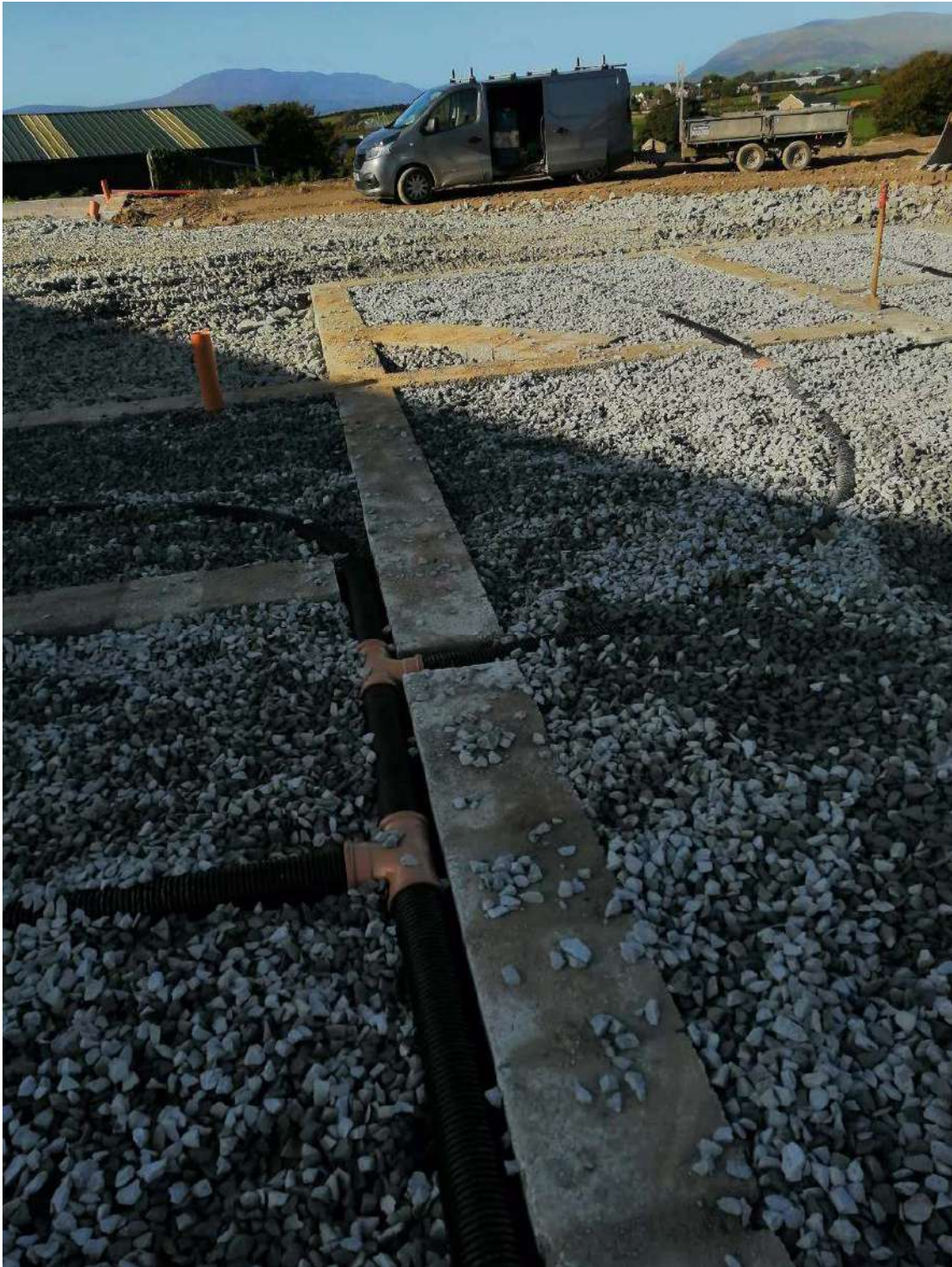
Building Research Establishment: <http://www.bre.co.uk/page.jsp?id=3137>

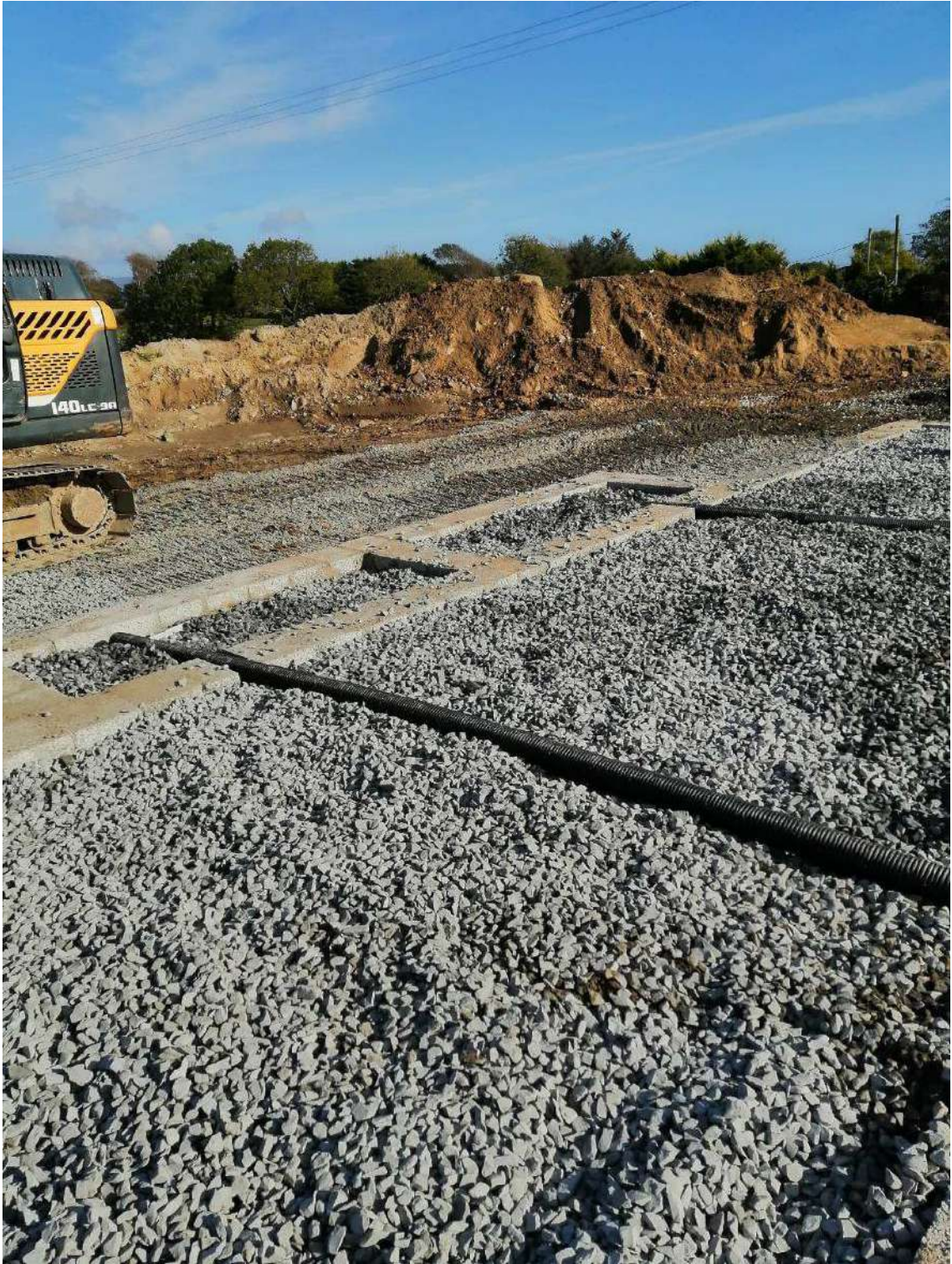


## **APPENDIX L: PHOTOGRAPHS OF PIPEWORK BENEATH DWELLING**

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Photographs provided by the client showing the installation of the perforated pipework beneath footprint of dwelling







Vent point located at ground level on the eastern side of the dwelling





## **APPENDIX M: LABORATORY ANALYSIS SCHEDULE**

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## Laboratory Analysis Schedule

Site Area	Parameters
Any materials imported to the site for infilling will be subject to the suite of analysis*	TPH-CWG Suite
	16 EPA Speciated PAHs
	VOCs
	Heavy Metals (As, Cd, Cr, Ni, Pb, Se, Hg, Zn, Cu) Chromium VI
	pH
	Asbestos

\* Note: This is the minimum suite of analyses undertaken for the site and may vary dependent on source material

Any material to be disposed off site will be done so in accordance with current waste management regulations and may include WAC testing to assess a materials suitability for disposal in an inert landfill.

11 March 2026

**Biodiversity Checklist – Ecological Statement: Greencastle Road, Kilkeel  
(Planning Ref: LA07/2022/0885/F)**

This ecology statement has been produced by Eolas Ecology to be read in conjunction with the NI biodiversity checklist completed for an application for the change of house type and garage, together with the relocation of garage previously approved under planning reference LA07/2018/0097/F at lands associated with no. 88 Greencastle Road, Kilkeel, Co. Down (central IGR J 29307 12794). Figure 1 illustrates the location of the site.

A site visit was completed by Catherine Reilly BSc (Hons), MCIEEM, who is a Principal Ecologist and Owner of Eolas Ecology. She has over 17 years' experience as working as a professional ecologist to include habitat and protected species surveys and designing site-specific mitigation proposals for a range of developments throughout NI. Catherine is a committee member of the NI Bat Group and is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

Application Details:

The current application is for a change of house type and garage (including relocation of the garage) which was previously approved under planning ref. LA07/2018/0097/F. The original application (for the construction of a replacement dwelling with domestic garage) was granted planning approval in June 2018. Since then, demolition works have been undertaken of the original dwelling along the road frontage (to the south of the site), with retention of the two existing outbuildings. Construction of the dwelling has been undertaken within the central aspect of the site, with a domestic garage located to the west. Access to the site is located along an entrance laneway to the east leading to/from Greencastle Road. All works for the construction of the building and garage have been completed. Remaining works to be undertaken (with regards to groundworks) include any landscaping of the site.

Designated Sites:

According to online GIS mapping<sup>1</sup> the site is located within the Mourne AONB. The area is designated due to its geological formation and varied landscapes, including the presence of moorland and

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<sup>1</sup> NIEA Map Viewer – available from <https://apps.daira-ni.gov.uk>



woodland. The application site is dominated by semi-improved neutral grassland, bare ground, scrub, buildings and spoil. These habitats do not contribute to the designating features of the AONB. The application for the change of house type will not have an adverse impact on the designation of the AONB. The closest statutorily designated site is Kilkeel Steps ASSI (located 1.2km east/northeast) and the White Water River ASSI (located 1.3km northwest). The site is not located within a non-statutory designated area, the closest being Cranfield Moraine Local Wildlife Site which is located 0.7km to the west.

#### Application Site:

A survey of the site was undertaken on 31<sup>st</sup> October 2025. Weather during the visit was dry and clear. The site was surveyed in line with standard guidance produced by JNCC, BCT and NIEA for habitats, bats, badgers and breeding birds. The site was walked, and habitat features were noted.

The site is currently occupied by the newly construction dwelling and associated buildings. Ground clearance works have been undertaken around the new structure and the original dwelling has been demolished. The site is bound to the north by agricultural grasslands delineated by hedgerows and treelines, to the east and west by residential dwellings and to the south by the Greencastle Road. The wider environs are dominated by improved agricultural grasslands with residential dwellings and farm holdings scattered throughout. The main residential area of Kilkeel is located 1.6km to the northeast. The site itself comprises of buildings, bare ground, scrub, grassland and spoil. A description of each of the habitats identified on site are provided below and distribution of these is illustrated in Figure 2.

#### **Habitats on Site:**

Dense scrub (JNCC A2.1) is located along an aspect of the southern boundary and to the central area of the site (photograph 1). This habitat is dominated by thickets of Bramble (*Rubus fruticosus*), Gorse (*Ulex europaeus*) and intertwined Hedge bindweed (*Calystegia sepium*) with scattered immature trees located to the southern aspect of the habitat, comprising of Sycamore (*Acer pseudoplatanus*). Areas of dense scrub provide suitable nesting locations for local passerines and are therefore assessed as being of moderate ecological value at the site level only. Development works for the construction of the dwelling have been completed. The area of dense scrub to the south will be retained, however, it is likely that areas of dense scrub to the central aspect of the site will be removed during any landscaping works. The removal of a small area of scrub will not have an adverse impact on local biodiversity (ensuring optimal timing for vegetation removal).





**Photograph 1: Dense scrub to the central area of the site**

Scattered scrub (JNCC A2.2) is present to the north and south of the site. This is present as small/individual stands of Gorse and Bramble, with immature Goat willow (*Salix caprea*) also noted throughout the areas (photograph 2). Scattered scrub is assessed as being of low ecological value due to its scattered nature and immature structure. The removal of any areas of scattered scrub (if required) will not have an adverse impact on local biodiversity.



**Photograph 2: Scattered scrub to the north**



Scattered conifer trees (JNCC A3.2) are located to the eastern aspect of the site (photograph 3) and comprise of a small number of Leyland cypress (*Cupressus x leylandii*) located along the access lane. These trees are assessed as being of low ecological value. No works are proposed to these trees, therefore no adverse impacts are predicted.



**Photograph 3: Scattered conifer trees to the east**

Areas of grassland on site are dominated by a semi-improved neutral sward (JNCC B2.2, see photograph 2 above). The habitat comprises of species such as; Cock's-foot (*Dactylis glomerata*), Yorkshire fog (*Holcus lanatus*), Perennial rye-grass (*Lolium perenne*), Bent (*Agrostis* sp.), Meadow-grass (*Poa* sp.), Creeping buttercup (*Ranunculus repens*), Soft rush (*Juncus effusus*), Ribwort plantain (*Plantago lanceolata*), Broadleaved dock (*Rumex obtusifolius*), Colt's-foot (*Tussilago farfara*), Spear thistle (*Cirsium vulgare*), Red clover (*Trifolium pratense*) and Common vetch (*Vicia sativa*). Areas of semi-improved neutral grassland are assessed as being of low ecological value. Any loss of this habitat for landscaping on still will not have an adverse impact on local biodiversity as it is likely that the seed bank will be retained in any dispersed soils.

An area of spoil (JNCC I2.2) is located along the northern aspect of the dwelling. This comprises of a mix of building rubble and excavated grounds around the dwelling. Areas of spoil are assessed as being of negligible ecological value.

There are 4 no. buildings located on site. These are associated with the new dwelling, domestic garage and 2 no. retained outbuildings. Buildings on site are assessed as being of negligible ecological value (with regards to habitats only). Additional information is provided below with regards to protected species.

Areas of bare ground (JNCC J4) on site are associated with stoned areas around the buildings and the access lane. Areas of bare ground are assessed as being of negligible ecological value.



**Protected Species:**

A ground level tree assessment (GLTA) was undertaken of all trees located within the site. Trees are confined to the east (conifer) and south (within areas of dense scrub). These were all observed to be in good health with no noticeable crevices or features present which may be utilised by roosting bats. Trees on site are therefore assessed as being of negligible roosting potential. As noted above, there are 4 buildings present on site. The dwelling (located centrally) is of block construction which has been rendered. Single storey outshoots are clad in stone. The building comprises of a gable roof covered in slate (photograph 4). This is a newly constructed structure and does not comprise of any gaps/crevice's which may be of utility to roosting bats. This building is assessed as being of negligible roosting potential. The newly constructed garage is located to the west of the dwelling and is of similar construction (photograph 5). Again, this is a newly constructed building and is assessed as being of negligible roosting potential. Outbuilding 1 is located to the south of the dwelling and is a single storey barn constructed of stone/block which is rendered. The building comprises of a gable roof covered in a mix of corrugated tin and asbestos sheets. Solar panels are also located along the southern aspect of the roof (photograph 6). Gaps are noted along wall plate/lower aspect of the roof. This building is assessed as being of low roosting potential. Outbuilding 2 is located to the southwest of the site and is constructed from block/stone which is rendered, with a gable roof covered in slate (photograph 7). There are numerous gaps along the slates which may provide access to bats for roosting. This building is assessed as being of moderate roosting potential. It should be noted that the two outbuildings are to be retained, therefore, no further survey works are required. However, should any future works be required for refurbishment/demolition of these outbuildings, these works can only be undertaken once emergence surveys have been undertaken by a suitability qualified ecologist.



**Photograph 4: Newly constructed dwelling**





**Photograph 5: Newly constructed garage**



**Photograph 6: Outbuilding 1 to the south of the dwelling**





**Photograph 7: Outbuilding 2 to the southwest**

The site and 30m buffer were surveyed for evidence of badger. No evidence of this species was noted during the survey. Adjacent embankments (created during removal of topsoil from the site) provide suitable locations for sett construction (however, no setts were currently observed). It is recommended that should works be required for the removal of these for redispersal on site, the areas should be re-checked for this species in order to ensure that no setts have been constructed in the interim.

The site provides suitable areas for breeding birds (scrub and trees). It should be noted that all species of breeding birds and their nests are protected under the Wildlife (NI) Order and also the Wildlife & Natural Environment Act. Therefore, any removal of vegetation (if required) must be undertaken outwith the breeding season which extends from 1<sup>st</sup> March to 31<sup>st</sup> August inclusive. Should these operations be required during this period, it is recommended that a qualified ecologist is appointed to survey the areas prior to construction activities for evidence of use by breeding birds. Should any breeding birds be identified, the area will need to remain undisturbed until all dependent young have fledged and the nest is no longer in use.

Signed:

Catherine Reilly BSc (Hons), MCIEEM





**Figure 1: Site Location Plan**





Figure 2: Phase I habitat map



# NI Biodiversity Checklist

Version 2 – April 2017

## Introduction

Designated sites of nature conservation importance, protected species, priority habitats, priority species and other natural heritage interests are all material considerations in the determination of planning applications. The degree to which these features may be impacted by a development proposal and any appropriate mitigation measures which may avoid, reduce or offset any impacts must be considered by the relevant planning authority before any planning permission can be granted.

The *Strategic Planning Policy Statement for Northern Ireland (SPPS)*<sup>1</sup> and *Planning Policy Statement 2: Natural Heritage (PPS2)*<sup>2</sup> set out planning policies for the protection of natural heritage interests in the Northern Ireland planning system.

Appendix 2 provides further information on the legal framework for the protection of Northern Ireland's biodiversity and natural heritage.

This Biodiversity Checklist is intended to provide a 'step by step' tool which can be used by applicants and their agents to help identify if a development proposal is likely to adversely affect any biodiversity and natural heritage interests and what information may be reasonably required to accompany a planning application in order to comply with the relevant legislation and planning policy.

A properly completed checklist will enable applicants to identify and consider potential biodiversity issues that could impact on their proposed planning application and/or influence the design of their project.

NIEA recommends the consideration of biodiversity issues at the earliest possible stage of project preparation/design to allow any necessary mitigation to be 'built in' to a project. The carrying out of any necessary ecological assessments or surveys at an early stage will also minimise the potential for any future delays in the processing of the planning application, such as through requests for further information or amendments to a proposal. This is particularly relevant when there are seasonal constraints to survey work which could significantly delay any decision being made.

A completed checklist, submitted with a planning application, will also assist planning authorities in considering the potential impacts of development proposals on biodiversity and natural heritage interests, what biodiversity information (e.g. surveys) may need to be submitted with an application, and when to consult with NIEA.

Planning applications submitted with adequate biodiversity information can help NIEA, as a statutory planning consultee, fully consider development proposals and provide substantive planning consultation responses within agreed timescales.

**'Biodiversity'** is the variety of plant and animal life in the world, or in a particular place or habitat, and includes all species of plants and animals and the habitats in which they live. Biodiversity is essential to sustaining the living networks and systems that provide us all with health, food, wealth, fuel and the vital services our lives depend on. It is therefore important to control activities which could negatively impact on Northern Ireland's rich biodiversity.

<sup>1</sup> Strategic Planning Policy Statement for Northern Ireland, September 2015:

<http://www.planningni.gov.uk/index/policy/spps.htm>

<sup>2</sup> Planning Policy Statement 2: Natural Heritage, July 2013:

[http://www.planningni.gov.uk/index/policy/planning\\_statements\\_and\\_supplementary\\_planning\\_guidance/pps2.htm](http://www.planningni.gov.uk/index/policy/planning_statements_and_supplementary_planning_guidance/pps2.htm)

## Key Aims

- To help ensure that biodiversity and natural heritage interests are adequately considered at the earliest possible stage in the planning process;
- To enable appropriate ecological advice to be obtained early in the development of a project to identify any necessary survey requirements or mitigation measures, including amendments to the location, layout and design of a proposal;
- To help speed up the application process for applicants and avoid unnecessary delays through natural heritage issues being discovered at a later date;
- To minimise the cost of ecological surveys or assessments to applicants by identifying any likely impacts to biodiversity and natural heritage interests and ensuring that only surveys which are reasonably required are carried out;
- To help ensure that development proposals comply with relevant nature conservation legislation;
- To help comply with best practice guidance such as the British Standard 42020:2013, "Biodiversity - Code of practice for planning and development".

## Scope

### Who/what is it for?

This Biodiversity Checklist is designed to be used by applicants (and/or their agents) for all local development<sup>3</sup> planning applications in Northern Ireland where another ecological assessment or survey has not already been completed. It is not intended to apply to larger developments, such as major and regionally significant applications, as it is assumed that for these an ecological assessment will be carried out.

This checklist is not intended for use on proposals that require an Environmental Statement under the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2015.

A properly completed checklist will help applicants determine what potential biodiversity impacts their development proposal may have and what ecological assessments or surveys would reasonably be required to be submitted with their planning application.

Planning applications submitted with specific flora and fauna surveys, e.g. bat, badger or habitat surveys would still benefit from the checklist being completed to rule out the requirement for other surveys, unless the ecologist completing the survey(s) has indicated that they do not consider that any further surveys are required.

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<sup>3</sup> See Development Hierarchy in *Strategic Planning Policy Statement for Northern Ireland, 2015*.

## Completing the Biodiversity Checklist

Answer all questions in Part 1 and Part 2.

If you answer **YES** to any question in Part 1 or Part 2 then the Evaluation and Ecological Statement in Part 3 must be completed by an ecologist or other suitably qualified person<sup>4</sup>.

If you answer **NO** to all questions in Part 1 and Part 2 then you can skip Part 3 and go straight to Part 4.

If you are submitting the checklist to the planning authority with your planning application then the Declaration in Part 4 must be signed and dated.

### Notes on Completing the Checklist

The person completing the checklist must have sufficient knowledge of the site and the proposed development.

The questions in Part 1 and Part 2 of this checklist can be answered by any applicant or their agent. However, if there is doubt over how to answer any question the advice of an ecologist or other suitably qualified person should be sought.

Part 1 contains questions relating to designated sites and priority habitats. Many developments have the potential to adversely impact designated sites and priority habitats through direct and indirect effects. Direct effects could include the loss of an area of habitat due to the footprint of a development or the pollution of a habitat from the release of polluted effluent or waste. Indirect effects could include changes in the hydrology of a site or habitat through drainage works carried out for a development nearby or impacts to a species associated with a site or habitat outside of the boundary of that site or habitat.

Part 2 contains questions relating to priority species and protected species. Many developments have the potential to adversely impact priority species and protected species through effects such as the damage or destruction of breeding or resting places, loss of foraging habitat and disturbance.

Part 3 requires an evaluation of the proposal and the completion of an Ecological Statement by an ecologist or other suitably qualified person. Any additional information required to support the application, such as ecological assessments or surveys, should be identified. These should be submitted to the planning authority along with the completed checklist. Appendix 1 contains guidance on the type of ecological assessment or survey which may be required and on mitigation.

NIEA has produced Standing Advice for planning applications on a range of habitats, species and development types which may help you to complete the checklist:

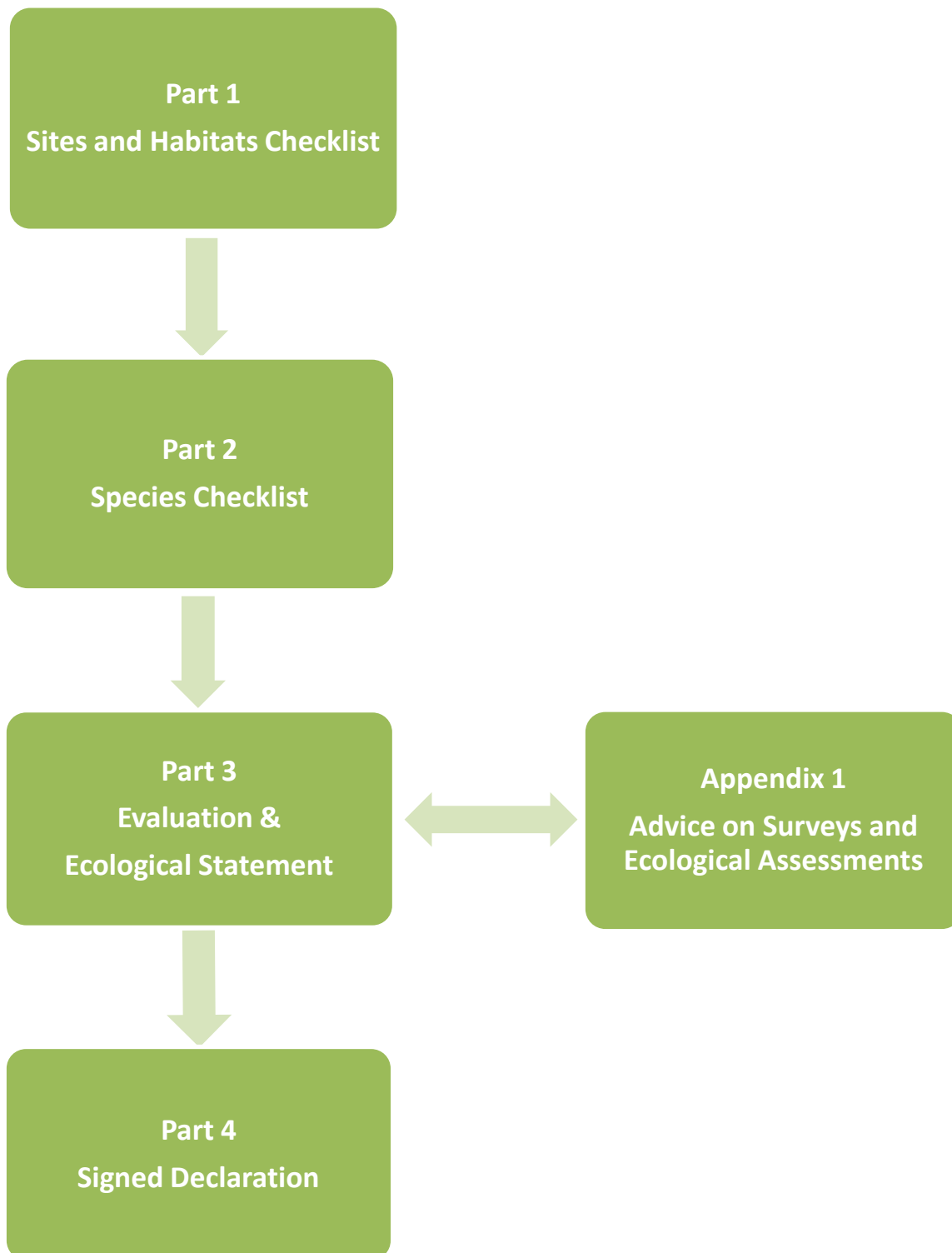
[http://www.planningni.gov.uk/index/advice/northern\\_ireland\\_environment\\_agency\\_guidance/standing\\_advice.htm](http://www.planningni.gov.uk/index/advice/northern_ireland_environment_agency_guidance/standing_advice.htm)

**NIEA recommends that fully completed checklists and any supporting ecological information be submitted with your planning application. This should help prevent any delays in the determination of your application through requests for further information.**

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<sup>4</sup> A suitably qualified person may be a planning consultant with an environmental qualification and experience of dealing with ecological issues in development proposals.

Figure 1: Process for Completing Biodiversity Checklist



## Part 1 - Designated Sites and Priority Habitats Checklist

Designated sites of national or international importance, which are legally protected, include Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Areas of Special Scientific Interest (ASSIs), National Nature Reserves (NNRs) and Ramsar Sites.

Further information on designated sites in Northern Ireland and an interactive map showing their distribution can be found at <https://www.daera-ni.gov.uk/services/protected-areas-web-viewer>

Other locally important sites for nature conservation include Local Nature Reserves (LNRs), Wildlife Refuges<sup>1</sup> and Sites of Local Nature Conservation Importance (SLNCIs)<sup>2</sup>.

Priority habitats<sup>3</sup> are those habitats in Northern Ireland which are important for biodiversity and have been identified as priorities for conservation action. Priority habitats occur throughout the country and at present there is no comprehensive dataset which shows their distribution.

	Please answer ALL questions	Please tick as appropriate
1	Is the development in or within 100m of a nationally or internationally designated site, e.g. SAC, SPA, ASSI, NNR or Ramsar site?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2	Is the development in or within 50m of a local site of nature conservation importance, e.g. SLNCI, LNR, Wildlife Refuge or any other site identified by the local Council?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
3	Are any of the following present on or within 50m of the application site: <ul style="list-style-type: none"> <li>Broad-leaved woodland or any woodland listed as Ancient or Long Established Woodland<sup>4</sup>?</li> <li>Peatland habitat, such as blanket bog, raised bog or heathland?</li> <li>Rivers or Streams?</li> <li>Lakes or ponds?</li> <li>Wetlands, fens or marshes?</li> <li>Flower rich meadows/grassland?</li> <li>Coastal habitats, including estuaries, sand dunes, rocky shore or salt marsh?</li> </ul>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
4	Will the development affect or involve the removal of: <ul style="list-style-type: none"> <li>Field hedgerows or mature tree-lines, more than 30m long, consisting mainly of native species?</li> <li>Parkland with mature trees?</li> </ul>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
5	Will the development, or any waste, effluent or run-off it produces, affect: <ul style="list-style-type: none"> <li>Minor watercourses or field drains, particularly those which are hydrologically linked to (drain into) a designated site or priority habitat?</li> </ul>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

<sup>1</sup> Wildlife Refuges are provided for under the Wildlife (Northern Ireland) Order 1985 (as amended)

<sup>2</sup> SLNCIs are identified in Local Development Plans

[http://www.planningni.gov.uk/index/policy/development\\_plans.htm](http://www.planningni.gov.uk/index/policy/development_plans.htm)

<sup>3</sup> <https://www.daera-ni.gov.uk/publications/northern-ireland-list-priority-habitats>

<sup>4</sup> See <http://www.backonthemap.org.uk/> for an inventory of Northern Ireland's ancient and long established woodland.

**NI Biodiversity Checklist - Version 2 - April 2017**

6	<p>Is the development of a type which produces air emissions, such as nitrogen<sup>5</sup>? See examples of development types below:</p> <ul style="list-style-type: none"> <li>• Intensive Livestock Units for poultry, pigs, cattle or sheep;</li> <li>• Anaerobic Digester Plants;</li> <li>• Combined Heat and Power Plants, Biomass Boilers;</li> <li>• Manure Storage Facilities.</li> </ul>	<p><b>Yes</b>      <input type="checkbox"/></p> <p><b>No</b>        <input checked="" type="checkbox"/></p>
7	<p>Is the application for any of the following:</p> <ul style="list-style-type: none"> <li>• Development in a rural location on a site greater than 0.5 hectares in area?</li> <li>• Quarrying or peat extraction?</li> <li>• Hydroelectric Scheme?</li> <li>• Wind Farm or Wind Turbine?</li> <li>• Solar Farm?</li> <li>• Any development which would require screening under the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2015?</li> </ul>	<p><b>Yes</b>      <input type="checkbox"/></p> <p><b>No</b>        <input checked="" type="checkbox"/></p>
<p><b>Proceed to Part 2</b></p>		

<sup>5</sup> NIEA has produced Standing Advice called "Livestock Installations and Ammonia". This recommends screening distances for developments which produce ammonia of 7.5km for designated sites and 2km for priority habitats. The document can be found here:

[http://www.planningni.gov.uk/index/advice/northern\\_ireland\\_environment\\_agency\\_guidance/standing\\_advice.htm](http://www.planningni.gov.uk/index/advice/northern_ireland_environment_agency_guidance/standing_advice.htm)

## Part 2 - Protected and Priority Species Checklist

Many species are protected by national and international legislation (see Appendix 2). Other species which are rare or endangered have been identified as priorities for conservation action and are listed as Northern Ireland priority species<sup>6</sup>. The following checklist identifies scenarios where development proposals may impact on these species and where survey information may reasonably be required.

	<p><b>Please answer ALL questions</b></p> <p><b>Does the development involve?:</b></p>	<p><b>Please tick as appropriate</b></p>	<p><b>If you have answered 'YES' to any question you will need to consider potential impacts to the following species:</b></p>
<p>1</p>	<p><b>The conversion, modification, demolition or removal of any building (including hotels, schools, hospitals, churches, commercial premises and derelict buildings) which are:</b></p> <ul style="list-style-type: none"> <li>• Houses in a rural location or agricultural buildings (e.g. barns and outbuildings) of traditional brick or stone construction and/or with exposed wooden beams;</li> <li>• Buildings with weather boarding and/or hanging tiles that are within 200m of woodland and/or water;</li> <li>• Pre-1960 detached buildings and structures within 200m of woodland and/or water;</li> <li>• Pre-1914 buildings within 400m of woodland and/or water;</li> <li>• Pre-1914 buildings with gable ends or slate roofs, regardless of location;</li> <li>• Located within 50m of woodland, parkland or water.</li> </ul>	<p>Yes <input type="checkbox"/></p> <p>No <input checked="" type="checkbox"/></p>	<ul style="list-style-type: none"> <li>• <b>Bats</b></li> <li>• <b>Breeding birds, particularly barn owls and swifts</b></li> </ul>
<p>2</p>	<p><b>Any development affecting built structures:</b></p> <ul style="list-style-type: none"> <li>• Tunnels, mines, kilns, ice-houses, adits, military fortifications, air raid shelters, cellars and similar underground ducts and structures;</li> <li>• unused industrial chimneys that are unlined and of brick/stone construction;</li> <li>• Bridge structures, aqueducts and viaducts or other structures over or near water.</li> </ul>	<p>Yes <input type="checkbox"/></p> <p>No <input checked="" type="checkbox"/></p>	<ul style="list-style-type: none"> <li>• <b>Bats</b></li> <li>• <b>Breeding birds</b></li> </ul>

<sup>6</sup> <https://www.daera-ni.gov.uk/articles/northern-ireland-priority-species>

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3	<p><b>Floodlighting or Lighting (excluding domestic lighting) of:</b></p> <ul style="list-style-type: none"> <li>• Woodland, parkland, mature trees, river corridors, waterbodies;</li> <li>• Green space (e.g. sports pitches) within 50m of woodland, water, field hedgerows or lines of trees with connectivity to woodland or water;</li> <li>• Churches, Listed buildings or any building meeting the criteria listed in (1) above;</li> <li>• Caves or built structures listed in (2).</li> </ul>	<p>Yes <input type="checkbox"/></p> <p>No <input checked="" type="checkbox"/></p>	<ul style="list-style-type: none"> <li>• Bats</li> <li>• Badgers</li> <li>• Birds</li> <li>• Otters</li> </ul>
4	<p><b>Felling, removal or lopping of:</b></p> <ul style="list-style-type: none"> <li>• Woodland (either broadleaved or conifer);</li> <li>• Field hedgerows or lines of trees &gt;1m high and 0.5m wide.</li> <li>• Mature trees;</li> <li>• Areas of scrub, including gorse.</li> </ul>	<p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p>	<ul style="list-style-type: none"> <li>• Bats</li> <li>• Badgers</li> <li>• Birds</li> <li>• Otters</li> <li>• Red squirrel</li> <li>• Smooth newt</li> <li>• Protected Plants</li> </ul>
5	<p><b>Development affecting or within 50m of:</b></p> <ul style="list-style-type: none"> <li>• Semi-natural woodland (broadleaved trees);</li> <li>• Rivers, streams or canals;</li> <li>• Lakes or reservoirs;</li> <li>• Peatlands (including bog and heathland);</li> <li>• Wetlands (including fen, swamp, reed beds);</li> </ul>	<p>Yes <input type="checkbox"/></p> <p>No <input checked="" type="checkbox"/></p>	<ul style="list-style-type: none"> <li>• Bats</li> <li>• Badgers</li> <li>• Birds</li> <li>• Otters</li> <li>• Red squirrels</li> <li>• Common Lizard</li> <li>• Butterflies &amp; Invertebrates</li> <li>• Fish &amp; freshwater species</li> <li>• Protected plants</li> </ul>
6	<p><b>Development affecting or within 25m of:</b></p> <ul style="list-style-type: none"> <li>• Any woodland (including broadleaf or conifer plantation);</li> <li>• Parkland or demesnes;</li> <li>• Field hedgerows (&gt;1m high and 0.5m wide), particularly near woodland or water bodies;</li> <li>• Areas of scrub, including gorse, particularly near woodland, field hedgerows or waterbodies.</li> <li>• Coastal habitats, including estuaries, sand dunes, rocky shore or salt marsh;</li> <li>• Ponds or field drains (with slow moving water);</li> <li>• Railway embankments (used or disused).</li> </ul>	<p>Yes <input checked="" type="checkbox"/></p> <p>No <input type="checkbox"/></p>	<ul style="list-style-type: none"> <li>• Bats</li> <li>• Badgers</li> <li>• Birds</li> <li>• Otters</li> <li>• Red Squirrel</li> <li>• Smooth Newt</li> <li>• Common Lizard</li> <li>• Butterflies &amp; Invertebrates</li> <li>• Seals</li> <li>• Protected Plants</li> </ul>

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<b>7</b>	<p><b>Development within or involving the modification, disturbance or removal of:</b></p> <ul style="list-style-type: none"> <li>• Mature or overgrown gardens, particularly those adjacent to woodland, parkland, field hedgerows or waterbodies;</li> <li>• Previously developed, derelict or brownfield land which is overgrown or flower rich;</li> <li>• Arable fields with hedgerows or grass margins;</li> <li>• Flower rich meadows / rough or wet grasslands.</li> </ul>	<p>Yes <input type="checkbox"/></p> <p>No <input checked="" type="checkbox"/></p>	<ul style="list-style-type: none"> <li>• Bats</li> <li>• Badgers</li> <li>• Birds</li> <li>• Smooth Newt</li> <li>• Butterflies &amp; Invertebrates</li> <li>• Protected Plants</li> </ul>
<b>8</b>	<p><b>Development within or immediately adjacent to:</b></p> <ul style="list-style-type: none"> <li>• Quarries, sand or gravel pits;</li> <li>• Natural cliff faces and rock outcrops with crevices or caves and swallets.</li> </ul>	<p>Yes <input type="checkbox"/></p> <p>No <input checked="" type="checkbox"/></p>	<ul style="list-style-type: none"> <li>• Bats</li> <li>• Badgers</li> <li>• Birds, particularly peregrines, sand martins</li> <li>• Protected Plants</li> </ul>
<b>9</b>	<p><b>Renewable Energy development, particularly:</b></p> <ul style="list-style-type: none"> <li>• Wind Turbines;</li> <li>• Solar Farms;</li> <li>• Hydroelectric Schemes.</li> </ul>	<p>Yes <input type="checkbox"/></p> <p>No <input checked="" type="checkbox"/></p>	<ul style="list-style-type: none"> <li>• Bats</li> <li>• Badgers</li> <li>• Birds</li> <li>• Otters</li> <li>• Butterflies &amp; Invertebrates</li> <li>• Fish &amp; freshwater species</li> </ul>
<b>10</b>	<p><b>Any development within or adjacent to a site where protected or priority species are known to be present?<sup>7</sup></b></p>	<p>Yes <input type="checkbox"/></p> <p>No <input checked="" type="checkbox"/></p>	<ul style="list-style-type: none"> <li>• All species</li> </ul>
<p>If you have answered <b>YES</b> to any of the above questions <b>Part 3</b> must be completed by an ecologist or other suitably qualified person.</p>			
<p>If you have answered <b>NO</b> to all questions in Part 1 and Part 2 you can go straight to Part 4.</p>			

<sup>7</sup> Confirmed as present by either a data search (for example through the Centre for Environmental Data and Recording (CEDaR) <http://nmni.com/cedar>) or as notified to the developer by the planning authority, NIEA or other nature conservation organisation.

### Part 3 - Evaluation & Ecological Statement

If you have answered **YES** to any questions in Part 1 or Part 2 please seek advice from an ecologist or other suitably qualified person to carry out an evaluation of the proposed development and complete the Ecological Statement below.

If you have answered **NO** to all questions skip this step and go to Part 4.

#### Notes

Answering YES to any questions in Part 1 or Part 2 indicates that the development may have an impact on biodiversity or natural heritage issues interests and further ecological assessments or surveys may be required. However, the nature of the development and/or any 'built in' avoidance or mitigation measures may mean that the likelihood of any significant impacts is negligible.

An ecologist or other suitably qualified person must complete the Ecological Statement below. If additional ecological assessments or surveys are being, or have been, carried out then this should be stated. If it is considered that no additional ecological assessments are necessary then clear justification for this must be provided. Please refer to Appendix 1 for further information.

#### **Ecological Statement**

A separate ecology statement is provided

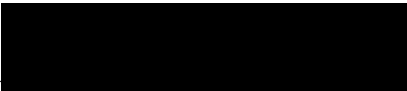
### Part 4 – Details of Proposal and Signed Declaration

This section must be completed for any checklist submitted to the planning authority with a planning application.

If only Part 1 and Part 2 of the checklist have been completed and all questions have been answered NO this declaration can be completed by the applicant or their agent.

If any questions have been answered YES this declaration must be completed by the ecologist or suitably qualified person who has completed the Ecological Statement in Part 3.

<b>Proposal (description of development)</b>	Change of house type and garage, together with the relocation of garage previously approved under planning reference LA07/2018/0097/F
<b>Location (address or location of development)</b>	88 Greencastle Road, Kilkeel
<b>Area of Site (hectares)</b>	
<b>Planning Reference (if known)</b>	LA07/2022/0885/F
<b>Name of Applicant / Agent / Ecologist* (*delete as appropriate)</b>	Catherine Reilly (Eolas Ecology)
<b>Relevant Qualifications / Experience (if applicable)</b>	BSc (Hons), MCIEEM
<b>Address</b>	
<b>Telephone</b>	
<b>E-mail</b>	catherine@eolasecology.com

I declare that this Checklist has been completed accurately to the best of my knowledge	
<b>Signed:</b>	
<b>Date:</b>	11/03/2026

## Appendix 1 - Ecological Assessments & Surveys

Where potential impacts have been identified to species and/or habitats in Parts 1 and/or 2 an appropriate ecological assessment or survey may need to be carried out and submitted with the planning application. An experienced ecologist can advise on the level of assessment or type of survey required, however, NIEA has provided guidance below.

For most developments the minimum level of assessment required is a **Preliminary Ecological Appraisal (PEA)**. This is a baseline ecological assessment, undertaken by an ecologist, which involves a desktop assessment and a site visit. It should map the habitats on a site, identify any significant ecological features, including any evidence of protected or priority species, and make recommendations for further surveys, if necessary. Where further surveys are not required the PEA may also recommend avoidance or mitigation measures to protect natural heritage interests on the site. NIEA recommends that PEA's follow the guidelines produced by the Chartered Institute of Ecology and Environmental Management (CIEEM), which can be found here:

[http://www.cieem.net/data/files/Resource\\_Library/Technical\\_Guidance\\_Series/GPEA/GPEA\\_April\\_2013.pdf](http://www.cieem.net/data/files/Resource_Library/Technical_Guidance_Series/GPEA/GPEA_April_2013.pdf)

Where the biodiversity checklist has identified potential impacts to only one particular species a single species survey may be sufficient. However, where there are potential impacts to designated sites, priority habitats and/or more than one species a more comprehensive assessment is likely to be required.

NIEA, Natural Environment Division (NED) survey specifications for different species can be found at the following link:

<https://www.daera-ni.gov.uk/articles/site-surveys>

For large or complex proposals an **Ecological Impact Assessment (EclIA)** may be required. The CIEEM document, *Guidelines for Ecological Impact Assessment in the UK and Ireland*, can be found here:

[http://www.cieem.net/data/files/Website\\_Downloads/Guidelines\\_for\\_Ecological\\_Impact\\_Assessment\\_2015.pdf](http://www.cieem.net/data/files/Website_Downloads/Guidelines_for_Ecological_Impact_Assessment_2015.pdf)

For proposals that may impact on European designated sites (SACs and SPAs) a **Habitats Regulations Assessment (HRA)** may be required to be carried out by the planning authority. Information to support the completion of the HRA may be requested from the applicant by the planning authority. An ecologist can advise on the type of information which is necessary.

Details of competent ecologists in your area that can undertake specialist survey work can be found on CIEEM's Professional Directory:

<http://www.cieem.net/members-directory>

A householders' guide for engaging the service of a professional ecologist can be found here:

<http://www.cieem.net/a-householders-guide-to-engaging-an-ecologist>

NIEA recommends that all works comply with **British Standard 42020:2013, Biodiversity - Code of practice for planning and development**. This provides recommendations and guidance for those engaged in planning and development, whose work might affect or have implications for conservation, or the enhancement of biodiversity.

<https://www.bsigroup.com/LocalFiles/en-GB/biodiversity/BS-42020-Smart-Guide.pdf>

### Mitigation

Where an ecological assessment or survey has identified potential impacts to a designated site, priority habitat, protected or priority species, or other natural heritage interest, then mitigation measures must be considered as to how these impacts can be addressed and a mitigation strategy developed to comply with the relevant legislation and planning policy. Mitigation should follow the 'mitigation hierarchy' which seeks, in order or preference, to avoid impacts, then to mitigate unavoidable impacts, and, as a last resort, to compensate for unavoidable residual impacts after avoidance and mitigation measures.

The best form of mitigation is always the avoidance of potential impacts on biodiversity and natural heritage interests in the first place. In most development situations, if important natural heritage features on a site can be retained and adequately protected impacts can generally be avoided and further survey work may not be required. This could involve, for example, the retention of mature trees and hedgerows on a site and their protection by appropriate fencing during construction works, or, the implementation of a suitable buffer, within which no works will take place, to protect natural heritage features from damage or disturbance.

The aim of any mitigation strategy should be to ensure that there is no net loss of biodiversity on a development site and to provide enhancements where possible.

Further information on mitigation best practice can be found in the British Standard 42020:2013, *Biodiversity - Code of practice for planning and development* and CIEEM's *Guidelines for Ecological Impact Assessment in the UK and Ireland*.

### Further Information

NIEA, Natural Environment Division has produced some relevant guidance for applicants and their agents which may be useful when considering development proposals on sites with natural heritage interests.

Please see the following web pages:

<https://www.daera-ni.gov.uk/articles/advice-and-information-planning-approval-land-which-nature-conservation-value>

NIEA "Bats & Development" booklet:

<https://www.daera-ni.gov.uk/publications/bats-development>

NIEA "Badgers & Development" booklet:

<https://www.daera-ni.gov.uk/publications/badgers-development>

NIEA "Otters & Development" booklet:

<https://www.daera-ni.gov.uk/publications/otters-and-development>

Guidance from NIEA on wildlife law, licensing and management can be found here:

<https://www.daera-ni.gov.uk/topics/biodiversity/wildlife-licensing-and-management>

## Appendix 2 - Legislative & Policy Context

Several pieces of legislation exist in Northern Ireland to protect biodiversity and nature conservation interests.

The European Commission's (EC) Habitats and Birds Directives<sup>8</sup> set out a framework for the protection of internationally important habitats and species. These are transposed into Northern Ireland law by the Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995 (as amended) (known as the Habitats Regulations) and the Wildlife (Northern Ireland) Order 1985 (as amended) (the Wildlife Order).

The Habitats Regulations sets out the protection afforded to European designated sites - Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) – and European protected species.

Before granting any planning approval planning authorities must consider whether a development proposal is likely to have a significant effect on a European designated site (SPA or SAC) through carrying out a Habitats Regulations Assessment (HRA). Planning authorities also have a legal duty to consider the impacts of development on European protected species. Those which occur in Northern Ireland are listed on Schedule 2 of the Habitats Regulations (includes bats and otters).

The Wildlife Order sets out the protection afforded to all wild birds and certain nationally protected species of flora and fauna. It also contains provisions for controlling the spread of invasive species. Nationally protected species in Northern Ireland, for example badgers, smooth newts and red squirrels are listed on Schedule 5 of the Wildlife Order. Protected Plants are listed on Schedule 8.

The Environment (Northern Ireland) Order 2002 (as amended) provides powers to designate, protect and manage Areas of Special Scientific Interest (ASSIs).

Other nationally and locally designated sites, such as nature reserves, are covered by the Nature Conservation and Amenity lands (Northern Ireland) Order 1985.

The Wildlife and Natural Environment Act (Northern Ireland) 2011 (known as the WANE Act) amended the Wildlife Order and introduced a biodiversity duty on all public bodies in Northern Ireland. It states that *'it is the duty of every public body, in exercising any functions, to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions'*.

The Northern Ireland planning system also plays an important role in conserving, protecting and enhancing our natural environment. The protection afforded to natural heritage interests in planning policy is additional to legislative requirements. This helps to meet national and international commitments to halt the loss of biodiversity.

The EU Biodiversity Strategy to 2020<sup>9</sup> has a headline target of *"Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss."*

The Northern Ireland Biodiversity Strategy's<sup>10</sup> mission is *"To make progress towards halting overall biodiversity loss, establish an ecosystem approach and help business and society in general have a greater understanding of the benefits that nature can bring to everyday life in Northern Ireland."*

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<sup>8</sup> Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive); and Directive 2009/147/EC on the conservation of wild birds (the Birds Directive).

<sup>9</sup> *Our life insurance, our natural capital: an EU Biodiversity Strategy to 2020:*  
<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52011DC0244>

<sup>10</sup> *Valuing Nature: A Biodiversity Strategy for Northern Ireland to 2020:*  
<https://www.daera-ni.gov.uk/publications/biodiversity-strategy-northern-ireland-2020-0>



## Consultation Details

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### Application Information

Reference: LA07/2022/0885/F  
Application Type: Full  
District Council: Newry, Mourne and Down District Council  
Planning Office: Newry, Mourne and Down District Council  
Development Hierarchy: LOCDEV  
Class: STAT  
Grid Reference: 329321/312897  
Applicant: Roy Elliot  
Agent:  
NIPP Case Officer: [REDACTED]  
Location: 88 Greencastle Road Kilkeel Newry Co. Down BT34 4ST  
Proposal: Proposed retention of change of house type and garage previously approved under planning reference LA07/2018/0097/F and ancillary site works (Amended). (Reconsideration- Amended plans and additional supporting information received).

### Consultation HPRM Reference

#### HPRM Reference

HPRM Reference: AE1-22-2980

### Consultation Information

Category: Statutory GDPO  
Development Type: Housing: Single Dwelling  
NIPP Consultation Reason: NED/RU - See a Biodiversity Checklist and QRA included in the information uploaded on the Planning Register today (16/03). PRT - Please upload the WTR single dwelling advice.

### Extended Consultation Period Information

Section Response Target Date: 01/04/2026  
NIPP Response Target Date: 06/04/2026  
Revised Target Date:  
Reason for Revised Target Date:  
Notes:

### Section Reference

Reference:

Add / Edit reference

Use the link below to maintain section reference

» [Maintain section reference](#)

## Case details

**Reference:** LA07/2022/0885/F  
**Authority:** Newry, Mourne and Down District Council  
**Address:** 88 Greencastle Road, Kilkeel, Newry, Co. Down, BT34 4ST  
**Category:** Local  
**Consultation Type:** Statutory

### Description:

Proposed retention of change of house type and garage previously approved under planning reference LA07/2018/0097/F and ancillary site works (Amended). (Reconsideration- Amended plans and additional supporting information received).

### Reason for consultation:

FAO REGULATION UNIT, WMU & NED RECONSULTATION- ADDITIONAL PLANS & SUPPORTING INFO RECEIVED FOR CONSIDERATION AND COMMENT.

## Case officer details

**Name:**

[REDACTED]

**Contact number:**

[REDACTED]

**Contact email:**

[REDACTED]