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**PRELIMINARY
ENVIRONMENTAL RISK ASSESSMENT
FOR
LAND ADJACENT TO KIRKLAND ROAD
ENNERDALE BRIDGE**

Part 1 of 4



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1.0 INTRODUCTION

This report has been prepared on the instruction of the Genesis Homes in support of an outline planning application being prepared for the development of eleven residential units with private gardens on land adjoining Kirkland Road, Ennerdale Bridge, Cumbria, CA23 3AP.

The aim of this report is to provide an understanding of the physical ground conditions and the environmental status of the site, and the constraints and implications which result. It also considers the potential liabilities which might arise due to any past uses of the site.

The report begins by providing background information on the site. The findings of the desk top study are then described, which include identification of natural and man-made environmental hazards and potential natural sensitive features such as surface water courses and groundwater, together with a review of the historical uses, based on historic mapping and other available information.

A full description of the site and surrounding area is provided, based on a site walkover inspection.

A review of the historical uses of the site and surrounding area has been used, together with contaminative land use information, to build up a list of potential contaminants and other environmental hazards which may be present. The information has been used to produce a summary or schedule of environmental hazards relating to the site, expressed in terms of sources, pathways and receptors.

A preliminary environmental risk assessment has been carried out using the source-pathway-receptor model, to categorise the site in terms of its likely environmental risks and to enable a Preliminary Conceptual Site Model to be generated. This draws together the known facts from the survey and assessment and identifies the main environmental constraints of the site, with recommendations as appropriate.

Conclusions are made about the environmental status of the site.

2.0 LIMITATIONS OF THE REPORT

The recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted industry practices. The report takes into consideration potential sources, pathways, receptors and evaluates potential pollutant linkages. Elliott Environmental Surveyors Ltd (EES) professional interpretation relies solely on the information made available by the Client, other background data and the desk top investigation which is stated in the report and the implications of the findings on the proposed use of the site.

Every care has been taken to ensure that the interpretation of the site condition is based on all known data collected and as such is not a guarantee that the site is free of unidentified hazardous or potentially hazardous materials.

EES have prepared this report for our Client. Any third party using this report does so entirely at his or her own risk. EES makes no warranty or representation whatsoever, express or implied, with respect to the use by a third party of any information contained in this report or its suitability for any purpose. EES assumes no responsibility for any costs, claims, damages or expenses (including any consequential damages) resulting from use of this report or any information contained in this report by a third party.

Report by	N F Pickard BSc CEnv MRICS	Signed	
Approved	T Elliott CEnv FRICS	Signed	
Date	16 th January 2018		

3.0 SITE BRIEFING

The site adjoins Kirkland Road on the northern edge of the village of Ennerdale Bridge, approximately 1.95km to the west of Ennerdale Water and approximately 4km to the east of Cleator Moor, Cumbria. A site location plan is attached as Appendix 1.

The site extends to an area of approximately 1ha and comprises part of an agricultural field with a slight to moderate gradient to the south.

A topographical survey plan showing the application area with existing site layout and a further plan showing the proposed site layout are presented as Appendix 2.

It is understood that the proposed development is for nine detached residential units with private gardens and a shared access onto Kirkland Road.

A walkover inspection was carried out by an EES Chartered Environmental Surveyor on 31st August 2017 and the findings are discussed in Section 6.

Photographs taken during the walkover are shown in Appendix 3.

4.0 ENVIRONMENTAL SETTING

In order to identify current land uses and natural or man-made hazards which may pose a risk to the site, and to understand the potential impacts of any contaminants from the site on the surrounding environment, desk study research has been carried out.

This has involved a review of information from a number of relevant sources, including but not restricted to, historical Ordnance Survey mapping, the British Geological Survey (BGS), Environment Agency and other organisations, some of which has been obtained as an environmental dataset in the form of a Groundsure environmental data report included as Appendix 4.

The relevant information from this review is set out in the following subsections.

4.1 Surface Water

Small localised water issues have been identified on site associated with areas of low lying land (see section 6).

The closest surface water feature to the site identified on mapping is a small watercourse emanating from 'Issues' located approximately 200m to the north which is no longer shown from a point adjoining the north eastern corner of the site. 'Issues' are also identified on the opposite side of Kirkland Road, approximately 10m to the south east of the site. The map of the river network presented on page 34 of the environmental data report (Appendix 4) shows that this represents the re-emergence from a culvert of the same watercourse described above. The culvert is shown to extend along part of the eastern boundary of the site.

The small watercourse emerging from the issues flows in a southerly direction and joins Croasdale Beck at a location approximately 80m to the south. Croasdale Beck flows through the village in a general south westerly direction from this location and joins the River Ehen at a point approximately 300m to the south west.

Reference has been made to the Environment Agency's interactive Catchment Data Explorer map which supports the Agency's River Basin Management Plan (RBMP), which is a programme of measures to meet the European Union's Water Framework Directive for the management of European rivers. The Catchment Data Explorer map confirms the site to be located within the upper Ehen Catchment.

The water body classification for this part of the Ehen shows that the ecological quality of the river for 2016 was assessed as 'Moderate' and the chemical quality was assessed as 'Good'. The good chemical quality represents an improvement since 2014, up until when some 'Fail' classifications had been recorded.

No surface water abstractions licensed by the Environment Agency have been identified from the environmental data report within a 1km radius of the site.

4.2 Flood Risk

According to the flood risk information included in the environmental data report (see Appendix 4), the site is not considered to be at risk from flooding from rivers or the sea. The highest risk of flooding on site has been determined to be 'Very Low'.

The Environment Agency Flood Map for Planning, available on the Gov.Uk website, identifies the site to be located within Flood Zone 1 which means that there is a low probability of flooding from main rivers or the sea.

The Environment Agency surface water flood risk map identifies a small linear area within the eastern part of the site where there is a 'Low' risk of surface water (pluvial) flooding. This area is located close to the line of the culvert identified in subsection 4.1 (above).

4.3 Geology

An assessment of the geology relating to the site has been made based on the following:

- The web based BGS Geology of Britain Viewer, the BGS lexicon of named rock units and BGS onshore Geoindex information;
- The 1:50,000 series BGS map, sheet 28 (Whitehaven) solid and drift edition dated 2004;
- The environmental data report for the site (see Appendix 4).

From the above it is anticipated that the sequence of strata beneath the surface of the site, in order of successive depth, is as set out below.

Artificial Ground	
None Identified	
Superficial Geology	
Glacial Till	To an unknown depth and comprising a poorly sorted sediment of a grey silty matrix with boulders and pebbles of granite, sandstone and volcanic rocks.
Solid Geology (Bedrock)	
Buttermere Formation	To an anticipated thickness possibly in excess of 1500m and comprising a chaotic mass of heterogeneous sedimentary material (olistostrome deposit) incorporating disrupted, sheared and folded mudstone, siltstone and sandstone turbidite olistoliths. There are two members near the middle of the Formation, the Goats Gill Member, a sedimentary breccia and the sandstone-dominated Robinson Member.

No areas of Artificial Ground, mass movement (landslip) deposits, faults or other linear features have been identified within a 1km radius of the site.

According to the Soilscales online viewer from the Cranfield Soil and AgriFood Institute, supported by Defra, the soils in the area are recorded as being slowly permeable, seasonally wet, slightly acid, but base rich loamy and clayey soils with impeded drainage.

4.4 Hydrogeology

The Environment Agency Aquifer Designation Map identifies the bedrock underlying the area as a Secondary B Aquifer. Secondary B aquifers are predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

The Aquifer Designation map also identifies the superficial (drift) deposits to be classified as Secondary Undifferentiated. Secondary Undifferentiated is assigned by the Environment Agency in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

In terms of groundwater vulnerability and soil leaching potential, the environmental data report identifies the report to be underlain by soils of low leaching potential.

It has also been identified from the environmental data report that superficial deposits associated with Crossdale Beck from approximately 40m to the south east and 50m to the south (and down gradient from the site) are classified as Secondary A Aquifer. Secondary A aquifers are more permeable layers capable of supporting water supplies at a local scale and will therefore be more sensitive to potential migrating contaminants.

The Environment Agency website indicates that the site is not located within 1km of any Groundwater Source Protection Zone in respect of a groundwater source (well, borehole or spring) used for public drinking water supply.

No groundwater abstractions licensed by the Environment Agency have been identified from the environmental data report within a 1km radius of the site.

4.5 Geological and Ground Working Hazards

The 'Review of Mining Instability in Great Britain' summary map dated July 1990 and prepared by Arup Geotechnics for the Department of the Environment (DoE), now Department for Environment Food and Rural Affairs (DEFRA), indicates that the area in which the site is located has been undermined for rock and that the existence of such mining is 'conclusive'.

The online Coal Authority Interactive Map Viewer shows that the site is not located within a coal mining reporting area (and therefore not located within a Development High Risk Area in terms of potential risks from coal mining legacy issues).

The environmental report (see Appendix 4) identifies the site to be located in an area where localised small scale underground mining of vein mineral may have occurred. However, the potential for difficult ground conditions is indicated to be unlikely or localised and at a level where they need not be considered.

A review of the Aditnow website <https://www.aditnow.co.uk/> identifies old ironstone mines within the higher ground in this region and a small number of lead mines on lower ground. However, the nearest historical mines in the area have been identified to be located at a reasonable distance from the site as follows:

Mine	Location
Salterhall Iron Mine	1.6km NW
Barbara Iron Mine	1.95km N
Flat-Fell Lead Mine	3km SW

With regard to natural ground stability hazards, the environmental data report refers to the six natural ground stability hazard datasets supplied by the BGS which indicates that the hazard potential from natural ground conditions across the site generally ranges from 'Negligible' to 'Low'.

However, the highest rating is a 'Moderate' hazard potential from compressible ground. This means that there is a significant potential for compressibility problems. Large differential loadings of the ground should be avoided. Ground near the property should not be drained or dewatered without technical advice. For new build, the possibility of compressible ground should be further considered in the geotechnical ground investigation, construction and building design. The effects of possible groundwater changes should also be considered. Extra construction costs are likely.

The environmental data report indicates that the site is not located within a Radon Affected Area and that no radon protection measures are necessary.

4.6 Pollution, Waste Disposal and Industry Information

The environmental data report (see Appendix 4) identifies a potentially contaminated use on site in the form of a 'Butt' from the historical map of 1863, which perpetuates in later mapping at a location approximately 8m to the south. However, interrogation of the historical maps (see Appendix 5) suggests that this relates to the place name 'Tom Butt' associated with a row of small buildings on the opposite of Kirkland Road to the south.

Other historical uses identified from the environmental data report within a 250m radius of the site include unspecified mills, a corn mill and smithy located between 85 and 160m to the east or south of the site.

The environmental data report shows that there are no records of historic or currently active landfill sites within a 500m radius and no records of current discharge consents, sites with Local Authority or Environment Agency permits, or where pollution incidents have been reported within a 500m radius of the site. The report also shows that there are currently no sites determined as Contaminated Land under Part 2A of the Environmental Protection Act 1990 within a 500m radius.

4.7 Soil Geochemistry

Reference to the on-line BGS maps on '*Contaminant distribution in soil*' for arsenic, cadmium, copper, nickel and lead dated 2013 indicates that the normal background concentrations of these elements in soil for the area in which the site is located are not elevated above levels of concern for human health currently applicable in the UK for residential use with home grown produce. However, it should be noted that these are estimated background levels for the area, and should not be relied on as reflecting the actual chemical status of the ground on site.

4.8 Surrounding uses

The site is located within a rural area on the northern edge of Ennerdale Bridge village with detached residential dwellings with gardens adjoining the site to the west, south and southeast.

The surrounding area is dominated by an open field to the north, but the environmental data report has identified one potentially contaminative industrial site within a 250m radius, the details of which are provided in the following table.

Company	Address	Activity	Category	Location
Electricity Sub Station	CA23	Electrical features	Infrastructure and facilities	173m SW

4.9 Environmental Designations

The following designated environmentally sensitive features have been identified from the environmental data report within a 1km radius of the subject site.

Designation	Name	Data Source	Location
Environmentally Sensitive Area	Lake District	Natural England	10m E
National Park	Lake District	Natural England	50m E
Special Area of Conservation	River Ehen	Natural England	275m SW
SSSI	River Ehen (Ennerdale water to Keeke Confluence)	Natural England	275m SW
SSSI	River Ehen (Ennerdale water to Keeke Confluence)	Natural England	290m SW
Ancient and Semi-Natural Woodland	Unknown	Natural England	540m W

Reference has also been made to Defra's MAgiC website which provides authoritative geographic information about the natural environment from across government. The information is managed by Natural England has identified the following habitat designations:

Designation	Name	Location
Conifer woodland on the National Forest Inventory	None given	90m NE
Deciduous woodland on the Priority Habitats Inventory	None given	140m E
	Stockhow Wood	540m W
Ancient and Semi-Natural Woodland	Stockhow Wood	540m W

4.10 Heritage Designations

A search of Defra's MAgiC website for heritage designations such as Scheduled Monuments, Registered Battlefields, Registered Parks and Gardens, World Heritage Sites and Listed Buildings, has not identified any heritage designations within a 500m radius of the subject site.

5.0 HISTORICAL REVIEW

A review of the history of the site and surrounding area has been carried out by reference to a comprehensive range of historical Ordnance Survey maps dating from between 1863 and 2014, copies of which are presented in Appendix 5.

The earliest map extract of 1863 shows the site to comprise part of 2 fields with isolated trees along the boundary between these fields and along part of the eastern site boundary with an adjoining road and the western boundary with a track.

The 1864 map extract shows a small watercourse flowing along the inside of the eastern site boundary from fields to the north. The watercourse is shown to be culverted beneath the road at a point approximately 50m from the south eastern corner of the site, before emerging on the opposite side of the road and continuing in a south easterly direction. The mapping after this date only shows the watercourse extending along the inside of a small section of the eastern site boundary within the north eastern corner of the site, with a suggestion that the section downstream from this location had been culverted (see section 4.1 for confirmation of this).

By 1898 the field boundary extending across the site had been removed when the site is seen to have formed part of a larger field. The map symbols on the 1923 map extract indicate that the field was rough pasture with parts of the same field to the north shown as furze (gorse).

The map symbol on the 1992 / 1994 map extract identifies the field as 'Bracken/rough grassland'.

No further significant changes within the site are shown since this time.

With regard to the surrounding area, the site is seen to have existed within a rural setting on the northern edge of the village of Ennerdale Bridge with a small number of residential dwellings adjoining the site to the south west and south.

Early mapping identifies Kelton corn mill approximately 155m to the east, associated with which were 2 small mill ponds located approximately 115m to the east at their closest point. The mill was disused by 1898 when the ponds were no longer evident, although another building also identified as Kilton Mill has been identified to the north of the previous mill (approximately 130m to the north east) from the map of 1969.

A smithy is identified within the village approximately 165m to the south on the extract of 1898 and whilst this is no longer identified after 1899, the building previously identified as smithy continued to be shown until 1970.

Additional Information

A review of Google Earth aerial imagery dating from 2003 to 2016 shows that the site has been used for sheep grazing. The imagery also shows areas of apparent thicker grassy vegetation extending north / south within the central and eastern parts of the site which correspond to areas of lower lying ground (shallow valleys) shown on the topographical survey plan provided in Appendix 2.

6.0 SITE WALKOVER INSPECTION

A site walkover inspection survey was carried out by an EES representative on 31st August 2017. The RICS property observation checklist for rural land uses was completed during the course of the visit to record obvious potential for contamination and representative photographs were taken which are presented as Appendix 3. The weather at the time of the inspection was dry and sunny.

6.1 Site Area

The site was observed to comprise a large field of rough grass with an overall slight to moderate gradient across the site to the south west. Site boundaries were defined as follows:

- A hedge of trees and shrubs and post and wire fencing along the eastern boundary with Kirkland Road;
- A garden hedge and the northern elevation of a residential dwelling and outbuilding along the southern boundary;
- A post and wire fence along the western boundary adjoin a vehicular track;
- Northern site boundary undefined on the ground.

No grazing animals were noted on site at the time of the inspection, although there was evidence of the site having been recently used for sheep grazing. The remains of a sheep carcass was also evident on the eastern part of the site. (See photo 11).

A low lying area of saturated ground dominated by a cover of rushy / marsh grass was observed within the eastern part of the site, from which a small issue of water emerged at a location near the eastern boundary (see photos 12 to 13). The small channel of water flowed for a short distance before sinking below ground into a possible culvert extending beneath Kirkland Road. The emergence of water within thick vegetation on the opposite side of Kirkland Road was observed from the roadside.

A small shallow valley was seen to extend down the centre of the site within an area of wet ground in which the surface vegetation was dominated by rushy / marsh grass. A small issue of water was observed to emerge from within the valley bottom near the southern site boundary, with the water disappearing beneath a stone slab before reaching the boundary (see photos 16 to 19).

There was evidence of some vegetation clearance and shallow excavation having recently taken place within this area (see photo 20) where a section of metal pipe approximately 40mm in diameter had been exposed extending east / west approximately 1m from and parallel with the southern site boundary.

A small private sewage treatment plant was noted within the south western corner of the site (see photo 21) where there was a cast iron Klargestor manhole cover with a smaller manhole cover located on the upstream side and brick constructed chamber with air vents (possible soakaway) with concrete cover located on the downstream side.

An old partially buried 205 litre rusted metal drum was noted a short distance down gradient from the brick chamber. Both ends of the drum were open from which there were no oily or chemical odours evident.

A small outfall / issue of water was observed extending from the south western corner of the site into a small shallow channel extending alongside the gravel track and flowing in a southerly direction. It is possible that the outfall is associated from the Klargester, but may also be from a shallow ditch extending along the outside of the western site boundary, much of which was hidden by vegetation.

6.2 Surrounding Area

The site is located in a rural area adjoining the northern edge of Ennerdale Bridge village with a small number of residential dwellings adjoining the site to the south west and south and areas of rough pasture adjoining the site to the north and east.

7.0 POTENTIAL CONTAMINATION AND DISCUSSION

The site is believed to have existed as agricultural fields since at least 1863 and apart from the removal of a field boundary, appears to have remained unchanged since this time.

Whilst a slight potential contaminative risk may be attributed to the site from the agricultural use, this is not considered significant for the proposed development.

An old 205 litre rusted metal drum has been identified partially buried within the south western corner of the site. Whilst drums can represent a potential source of contamination (usually oils or chemicals), the drum in this case was very old with both ends open (no contents) and from which no residual odours were evident. Whilst the drum is not considered to represent a significant potential source in terms of the proposed change of use, there may be a slight residual risk to human health and controlled waters.

In terms of potential contaminative uses within the surrounding area, these include a smithy previously located approximately 165m to the south and a corn mill with associated mill ponds previously located approximately 115m to the east. However, these are located down gradient from the site and the ponds (if backfilled) are considered too small and too old to represent a significant volume source for gas generation which in any event would tend to migrate vertically to atmosphere since they have not been capped by surface development. Potential contaminative uses from within the surrounding area are therefore not considered to represent a significant risk to the proposed development.

8.0 ENVIRONMENTAL HAZARD SCHEDULE

Using the information determined from the site inspection, desk study and other available information, it is now possible to produce an assessment of the environmental hazards relating to the site in the context of the proposed development.

Item	Aspect of Model	Valid ?	Explanation
Contaminants from on-site sources	Source	Yes	1 no. old 205 litre rusted metal drum with open ends within the south western corner of the site which is of limited concern due its location at the furthest point down gradient within the site and no evidence of residual contents.
Contaminants from off-site sources	Source	Yes	A small number of potentially contaminative uses within the wider surrounding area that are of limited concern due to their distance and down gradient location from site.
Dermal contact / ingestion of soils / waters	Pathway	Yes	These pathways are considered feasible for site workers and future occupants from soils, surface waters (issues and saturated ground) and possible perched water within the soils.
Migration and inhalation of dust	Pathway	Yes	This pathway is considered feasible on this site, but unlikely, with no significant potential sources identified.
Ingestion of home grown produce	Pathway	Yes	The development includes proposed garden areas, so the pathway could exist. However, with exception of the isolated drum, no on site sources of contamination have been identified and there are limited off site sources.
Migration and inhalation of gases / vapours	Pathway	Yes	These pathways are considered feasible on this site, but considered limited by the absence of significant gas and vapour sources.
Migration / leaching / run-off	Pathway	Yes	The runoff pathway could exist, due to topography. Run-off of soils will need to be adequately controlled to protect neighbouring property, fields and watercourses.
Water supply pipes	Pathway / Receptor	Yes	A feasible pathway, but limited by the absence of potential contamination sources with the exception of the isolated drum.
Site workers	Receptor	Yes	Site workers may be exposed to soils at the location of the isolated drum in the south western corner of the site during ground excavations.
Future site occupants	Receptor	Yes	Future residents may be exposed to soils or consume produce grown at the location of the isolated drum in the south western corner of the site.
Neighbouring occupants	Receptor	Yes	A small number of residential dwellings with gardens adjoin the site down gradient to the south. Run-off of soils will therefore need to be controlled and soil dust in dry windy conditions.
Surface water	Receptor	Yes	Surface water arising from small issues on site and emerging from the site via a culvert beyond the eastern site boundary. Care will therefore be needed to ensure that there is no run-off of soils.
Aquifers	Receptor	Yes	The presence of saturated ground and water issues in places indicates the presence of groundwater at shallow depth within the Glacial Till which has a low leaching potential and is above predominantly low permeability layers of the Secondary B bedrock aquifer.

Item	Aspect of Model	Valid ?	Explanation
Ecological systems	Receptor	Yes	No sensitive ecological receptors have been identified on site, but potentially sensitive ecological receptors have been identified within the wider surrounding area and include the Lake District National Park and River Ehen (SAC & SSSI) and areas of woodland.
Property	Receptor	Yes	Occupied residential dwellings with gardens adjoin the site to the immediate south and in close proximity to the south west and south east.

9.0 ENVIRONMENTAL RISK ASSESSMENT AND CONCEPTUAL SITE MODEL

Using information gathered in the desk top study, it is now possible to summarise the environmental hazards related to this site. These hazards are considered in terms of the linkages between sources, pathways and receptors which can be used in carrying out risk assessments. In this model, the **source** is normally a contaminant or pollutant, with the **pathway** a route for a contaminant to move within the environment towards a receptor. A **receptor** can be a natural feature such as a river, groundwater or may include humans. The validity of each aspect, based on current information available, is then given together with a justification.

9.1 Environmental Regulations & Risk Ratings

This approach is in accordance with the contaminated land provisions under Part 2A of the Environmental Protection Act 1990. Under the 2014 revised Statutory Guidance implementing these provisions, land is defined as being contaminated if:-

- Significant harm is being caused or there is a significant possibility of such harm being caused to human health, or relevant non-human (ecological or property), receptor; and / or
- Significant pollution of controlled waters is being caused, or there is a significant possibility of significant pollution of controlled waters being caused.

Therefore the stated risk values also relate to the likelihood of the site being described as contaminated.

Risk Rating	Explanation
Very High	There is a high probability that severe harm could arise to a given receptor from an identified hazard without appropriate risk management measures. There may already be evidence of an impact occurring or a high probability that the risk may be acute in nature.
High	Harm is likely to arise to a given receptor from an identified hazard at the site without appropriate risk management measures.
Medium	It is possible that without appropriate remedial action harm could arise to a given receptor but it is relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely that such harm would be relatively mild.
Low	It is possible that harm could arise to a given receptor from an identified hazard, but it is likely that at worst, that this harm if realised would normally be mild.
Very Low	The presence of an identified hazard does not give rise to the potential to cause significant harm to a designated receptor.

9.2 Conceptual Site Model

A Conceptual Site model has been used to indicate where a pollution linkage has been shown to exist or where there is incomplete information at this stage.

Whilst no significant potential sources of contamination have been identified on site, there may be slight residual risk from the remains of an old 205 litre rusted metal drum which is partially buried within the south western corner of the site.

At the time the drum is removed for appropriate offsite disposal the underlying soils should be inspected to observe for any visual or olfactory evidence of residual contamination and soil samples taken for analysis as a precaution.

Potential sources of contamination identified within the surrounding area are not considered significant in the context of the proposed development.

Whilst the risks to the environment are considered to be low, it will be necessary to ensure that construction activity does not impact on the environment, via spillages or leakages. Run-off from soils will also need to be adequately controlled to ensure that there is no impact on third party property and local watercourses.

The Conceptual Site Model and risk assessment for the proposed residential use with the consumption of home grown produce is set out in tabular form as follows:

Source	Pathway	Target	Risk Rating	Justification and Requirements for Further Assessment or Mitigation
Contaminants from on-site sources	Dermal contact / ingestion of soils / waters	Construction workers	Low	Residual risk from a single 205 litre rusted metal drum partially buried within the south western corner of the site can be mitigated by wearing the appropriate PPE.
		Future site occupants	Low	Residual risk from the partially buried metal drum within the south western corner of the site to be inspected by an environmental consultant following removal and undergo precautionary soil sampling to confirm that there is no risk to future occupants.
	Migration and inhalation of dusts	Construction workers	Very Low	No significant potential sources have been identified.
		Future site occupants and neighbours		
	Ingestion of home grown produce	Future site occupants	Low	Precautionary testing of soils beneath the partially buried metal drum required to ensure there is no risk to future occupants.
	Migration and inhalation of gases / vapours	Future site occupants	Very low	No significant gas and vapour sources have been identified.
	Migration / leaching / run-off	Surface waters	Low	Surface water has been identified on site and adjoining the site and will require adequate measures to ensure materials stored on site do not impact on the environment, via spillages or leakages and that run-off from the development is adequately controlled.
		Ecological Systems		
		Aquifers	Very low	Percolation limited by the underlying soils of low leaching potential and predominantly low permeability layers of the bedrock aquifer.
		Property	Low	Nearby property may be at risk from runoff of soils on site or spillages or leakages if not adequately controlled.

Source	Pathway	Target	Risk Rating	Justification and Requirements for Further Assessment or Mitigation
	Water supply pipe	Future site occupants	Low	No significant potential sources of contamination have been identified, but reassessment maybe required if contaminants associated with the drum are identified.
Contaminants from off-site sources	Migration / leaching / run-off / dermal contact / ingestion of soil / water / dusts / gas / vapours	Construction workers and future site occupants	Very low	Limited off-site sources, with limited potential for migration onto the site.

10.0 CONCLUSIONS AND RECOMMENDATIONS

In the context of the proposed development of the site for residential use, the overall level of risk to human health and the wider environment from on and off-site sources relating to the historical and existing uses is considered to be Low.

The site comprises a field of rough pasture with a slight to moderate gradient to the south and with saturated ground in low lying areas where there are occasional seepages at the surface.

The proposed development is for several residential dwellings with private gardens and a single shared access onto Kirkland Road.

The main risks identified from conducting this study relate to the following on-site sources:

- The remains of an old and empty 205 litre rusted metal drum partially buried within the south western corner of the site.
- The potential for surface water runoff (incorporating soil sediment) migrating offsite during periods of wet weather which may be exacerbated by the areas of wet ground within the low lying areas of the site.

Whilst a small number of off-site potentially contaminative sources have been identified, it is considered that these are of low significance in terms of their potential risk to the proposed development.

On the basis of the desk study and walkover inspection survey, a full phase 2 intrusive investigation of the site for contamination is not considered necessary. However, in order for the development to proceed with minimal risk to human health and the wider environment, the following measures are recommended:

1. Removal of the metal drum by registered waste carrier for disposal at an appropriately licensed waste management facility with the appropriate waste transfer documentation being retained for future reference.
2. Inspection of the soils beneath the drum by a suitably qualified environmental consultant following removal, to confirm that there is no risk to future occupants and the water environment, with precautionary soil sampling if necessary for laboratory analysis.
3. Measures to be provided by the developer to control run off from the site during the development which might otherwise migrate into nearby surface watercourses or adjoining property by virtue of the surface topography and wet ground conditions.

Providing the key risks are carefully managed and measures validated, the potential risks to construction workers, future site occupants and the wider environment can be adequately controlled.

As with any development site, if any contamination is exposed as a result of the work on site, it will need to be examined and assessed by a suitably qualified environmental consultant.

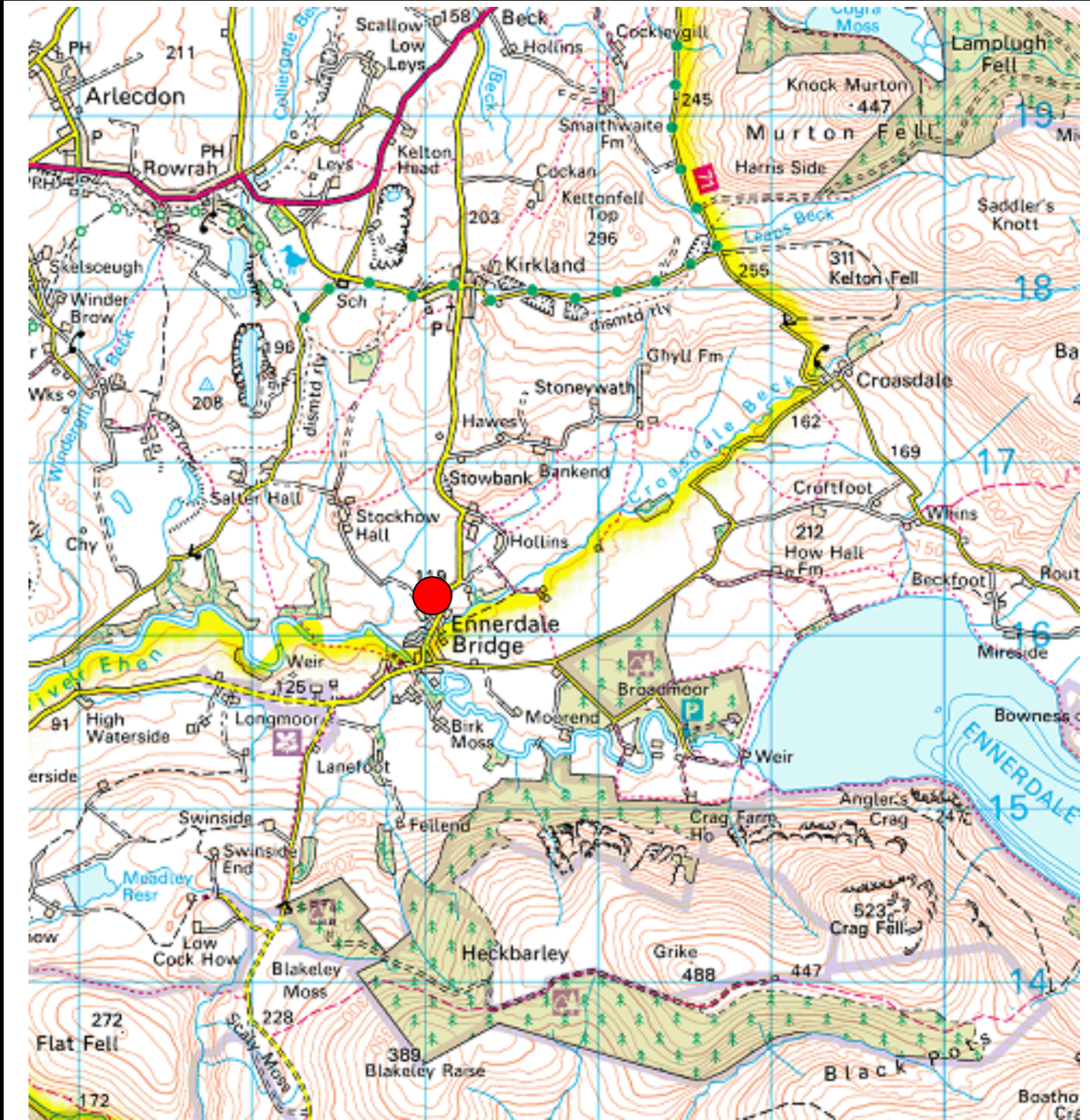
The following issues also need to be considered:

1. In terms of natural ground subsidence, a 'Moderate' hazard potential from compressible ground has been identified for the site which may have

- geotechnical implications in terms of foundation design. This information should therefore be passed on to the client's geotechnical engineer.
2. A small watercourse flows along part of the eastern site boundary from where it is believed to be culverted beneath the road before emerging on the opposite side of the road and continuing in a south easterly direction. It is therefore recommended that a plan of the public sewers for the site is acquired from the water company (believed to be United Utilities) to clarify the position of the culvert. There may also be implications for responsibility for the maintenance and upkeep of the culvert which should also be clarified.
 3. A Klargestar has been identified within the south western corner of the site. This is a small private sewage treatment plant from which there will be a discharge of treated effluent to either surface or groundwater. The properties served by the Klargestar will need to be identified, since it is anticipated that the Klargestar will need to be modified or incorporated into the sewage treatment system for the development. Since 2015 all sewage discharges have to comply with the Environment Agency General Binding Rules with which any modification to the Klargestar will need to comply. Even if no modification is proposed, there may still be requirements under the rules which would need to be checked and for which specialist advice should be sought.

APPENDIX 1 – Site Location Plan

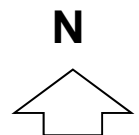
Location Plan



Project Code: EES17-099
Version Status: Final

Drawn by: J C Cooper
 Reviewed by: N Pickard
 Approved by: T Elliott

 **Site**



Scale@A4 NTS

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ELLIOTT
 Environmental Surveyors

APPENDIX 2 – Existing and Proposed Site Layout Plans

Map: OS Master Map Map Export Site Boundary Measure Undo Clear All

Aerial Image

116.7m

116.1m

109.7m

118.3m

The Strands

Kents Bank

Barlaside

Cattle Grid

Prospect House

Pasture Gate

Tom Butt

The Byers

Riverside

Croasdale


Bridge End

Fall View

Issues

v=kNnQn6yYCaM)

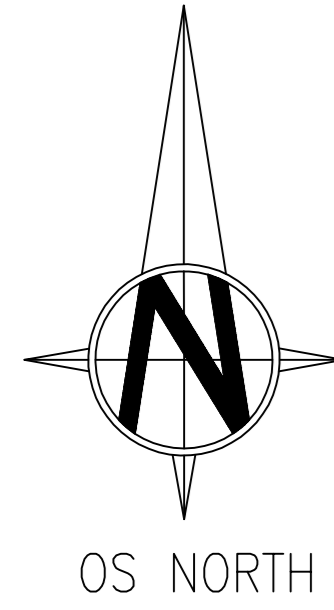
Unlimited viewing allowance

 Aerial Image and Transparency
youtube.com

(<https://www.youtube.com/watch?v=kzsPeai-ZuY>)

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Accept



DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS

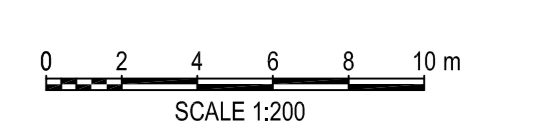
NOTES

- UNLESS NOTED OTHERWISE, ALL DIMENSIONS ON THIS DRAWING ARE IN METRES.
- ALL LEVELS ARE IN METRES AND RELATED TO NEWLYN DATUM, ALL CO-ORDINATES ARE RELATED TO ORDNANCE SURVEY NATIONAL GRID.

TOPO LEGEND

AM	AERIAL MAST	IC/WO	INSPECTION COVER WASH OUT
AC	AIR CONDITIONING UNIT	IL	INVERT LEVEL
AV	AIR VALVE	TL	TRUCK JUNT
BB	BELISHA BEACON	KO	KERS OUTLET
BL	BED LEVEL	LAD	LADDER
BM	BENCHMARK	LB	LITTER BIN
B	BUILDING	LD	LAY DOWN AREA
BH	BURDOLLE	LP	LAMP POST
BS	BUS STOP	ME	METRES EAST
CAB	CABINET	NR	MANHOLE
CAB/OT	CABINET BRITISH TELECOM	NMW	NEAR HIGH WATER LEVEL
CAB/EL	CABINET ELECTRIC	NLW	NEAR LOW WATER LEVEL
CDM	CANOPY LEVEL	MP	MARKER POST
CB	CRASH BARRIER	MP/BT	MARKER POST BRITISH TELECOM
CS	CABLE	MPEL	MARKER POST ELECTRIC
CD	CHANNEL DRAIN	MP/GA	MARKER POST GAS
CC	CONC. DUCT COVER	MP/WA	MARKER POST WATER
CHS	CHEMICAL OIL STORE	NE	NOTICE BOARD
CLM	COLUMN	NP	NAME PLATE
CNB	CONCRETE BASE	OH	OVERHEAD ITEMS
CONC.	CONCRETE	OHBT	OVERHEAD BRITISH TELECOM
CP	CATCHMENT	OH/EL	OVERHEAD CABLES
CPL	CROWN PIPE LEVEL	OH/PL	OVERHEAD POWER LINES
CPS	CONC. PIPE SUPPORT	OH/PS	OVERHEAD PIPE SUPPORT
CT	CABLE TRAY	OH/PE	OVERHEAD PEERIDGE
DB	DROP BARRIER	OH/PS	OVERHEAD PEERIDGE SUPPORT
DBB	DROP BARRIER BOX	P	POLL
DBP	DROP BARRIER POST	PB	POINTS BOX
DK	DRAIN	PC	PEDESTRIAN CROSSING
DK	DRAINER	PCN	POINT CROSSING NOSE
EED	EMERGENCY EQUIPMENT BOX	PD	PEDESTRIAN CROSSING NOSE
EBS	EMERGENCY SHOWER	PL	PEDESTRIAN LIGHTING BOLLARD
EL	EAVES LEVEL	PL	PEDESTRIAN LIGHTING BOLLARD
EP	ELECTRIC POLE	PM	POINT MOTOR
ERH	EARTH ROD	PO	POST BOX
FIBDS	FIBRE OPTIC	PO	POST BOX
FE	FIRE EXTINGUISHER	PS	PIPE SUPPORT
FED	CHAINLINK FENCE	PS	PIPE SUPPORT
FENC	TIMP. FENCE FENCE	RG	ROOFING GIE
FEPA	PANEL FENCE	RS	PEDESTRIAN BARRIER
FEPE	PANORAMA FENCE	RL	ROOF LEVEL
FEFW	POST & WIRE FENCE	RL	ROOF LEVEL
FEFV	POST & RAIL FENCE	RP	REFLECTOR POST
FEWM	WELMESH FENCE	RS	ROAD SIGN
FI	FIRE HYDRANT	RS	ROLLER SHUTTER DOOR
FL	FLOOD LIGHT	RTW	RETAINING WALL
FL	FLOOR LEVEL	RWP	RAN WATER PIPE
FP	FOOTPATH	S	SCALE LINE
FS	FAC STAMP	SD	SLIDING DOOR
G/S/H	TREE GIRTH SPREAD HEIGHT	SG	RAIL SIGN
GA	GATE DOUBLE	SL	SLOTTED LEVEL
GA	GATE SINGLE	SN	GENERAL SIGN
GAS	GATE BURSTLE	SR	SPEED RESTRICTOR
GB	GRIFF	SR	SPEED RESTRICTOR
GSS	GAS BOTTLE STORE	ST	STOP TAP
GOC	GRAVEL DUCT COVER	ST	STOP TAP
GP	GRASS POST	SHDR	STEPS WITH HANDRAIL
GPP	GRASS POINT	SW	STOP VALVE
GV	GULLY	SWP	SOIL VENT PIPE
GV	GULLY	SW	STOP VALVE
HDR	HANDRAIL	TEL	TELEPHONE
HR	HIGHT RESTRICTOR	TEL	TAMING LIGHT
HL	HEIGHT	TL	THRESHOLD LEVEL
IB	INSPECTION BOX (NOT BURIED)	TP	TELEGRAPH POLE
IC	INSPECTION COVER UNKNOWN	TS	TRUCK SWITCH
IC/BH	INSPECTION COVER BRENKLE	UL	UNDERPASS LEVEL
IC/EL	INSPECTION COVER ELECTRIC	UP	DIRECTION OF INCLINE
IC/TH	INSPECTION COVER FIRE HYDRANT	WV	VENT PIPE
IC/EL	INSPECTION COVER ELECTRIC	WJ	WELD JOINT
IC/GA	INSPECTION COVER GAS	WL	WATER LEVEL
IC/SL	INSPECTION COVER STREET LIGHT	WP	WASTE PIPE
IC/WA	INSPECTION COVER WATER	WYDXXX	SURVEY STATION

REV	DESCRIPTION	BY	CHK	APP	DATE
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Project:
**ENNERDALE VIEW
PLANNING PROPOSAL**

Drawing Title:
**ENNERDALE VIEW
TOPOGRAPHICAL SURVEY**

Scale @ A0	Drawn	Date	Checked	Date	Approved	Date
1:200	DM	14/08/17	RB	16/08/17	AG	16/08/17
Project No.	Office	Type	Drawing No.	Revision		
A103748	22	GS	WYG001	A		

REVISIONS:		
Revision	--	00.00.00
DESCRIPTION		

Target Unit Schedule		SQ M	SQ Ft	Units	Total SQ M	Total SQ Ft
Hon	The Honister Detached House 4 Bed	188.9	2034	3	567	6101
Lan	The Langdale Detached House 5 Bed	201.0	2163	3	603	6489
Lan V2	The Langdale Detached House 5 Bed	201.0	2163	1	201	2163
Rye	The Ryedale Detached House 4.5 Bed	172.4	1855	1	172	1855
Enn	The Ennerdale Bungalow 3 bed	148.8	1601	1	149	1601
Dee	The Dee Bungalow 2 Bed	64.5	694	2	129	1388
Totals				11	1821	19597

Parking: 2.5 Spaces min (inc garages over 20 sq ft)



Site Area 9872 sq m or 0.987 hectares (to be confirmed).



visibility splay 2.4 x 41 m

Signature units
 Cumberland style (render / slate / stone)
 Indigenous to the village

Dwarf stone wall

visibility splay 2.4 x 35 m

Treatment plant access
 Timber farm gate and posts
 Splayed stone wall either side

MANNINGELLIOTT
 PARTNERSHIP

Chartered Architects & Designers
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project title:
Proposed Housing Development
 Kirkland Road
 Ennerdale Bridge

drawing title:
Site Plan as Proposed

issue stage:
FOR COMMENT

date: NOV 17 drawn: MH/NB scale @ A1/A3: 1:250 / 500

drawing number: 1722-PL201 revision: -

APPENDIX 3 – Photographs
See Part 2

APPENDIX 4 – Environmental Data Report
See Part 3

APPENDIX 5 – Historical Maps
See Part 4