Whitcher Wildlife Ltd.
Ecological Consultants.

WINDMILL HILL QUARRY, BRIERLY ROAD, GRIMETHORPE.

OS REF: SE 41062 10163.

ECOLOGICAL IMPACT ASSESSMENT (EcIA).

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1. INTRODUCTION.

1.1. There are plans to develop an area of land off Brierley Road in Grimethorpe; the plans include the erection of five residential properties. Proposed development plans can be found in Appendix VIII.

1.2. Whitcher Wildlife Ltd has been commissioned to carry out a Preliminary Ecological Appraisal of the site to establish whether there are any issues that may affect the proposed works. That survey was carried out on 23rd February 2021 and during the survey a rock face on the site was assessed to provide low potential for roosting bats and a pond was identified within 500m of the survey area.

1.3. As a result, a subsequent bat dusk emergence survey of the rock face and great crested newt eDNA survey were carried out. These surveys were carried out on 7th June 2021.This report outlines the findings of all surveys carried out and makes appropriate recommendations.

1.4. Appendices I to IV of this report provide additional information on specific species and are designed to assist the reader in understanding the contents of this report.

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2. SURVEY METHODOLOGY.

2.1. Prior to visiting the site, the survey area was cross referenced to maps and aerial photographs to give a general idea of the habitats and potential issues within the area and to identify potential access and walking routes.

2.2. The survey area was walked where access was agreed and public rights of way were used where no access was agreed. All habitats within and immediately around the survey area were documented and the dominant species within that habitat listed in line with the JNCC Handbook for Phase 1 Habitat surveys.

2.3. The survey area and immediate surrounding area was thoroughly searched for evidence of badger (*Meles meles*) activity by looking for the following signs in line with Harris S, Cresswell P and Jefferies D (1989). *Surveying Badgers*. Mammal Society: -

* Badger setts.
* Badger latrines or dung pits.
* Badger snuffle holes and evidence of foraging.
* Badger paths.
* Badger prints in areas of soft mud.
* Badger hairs caught on fencing.

2.3. The survey area was searched for watercourses and where found all watercourses within the survey area and for approximately 100m in each direction were thoroughly searched for evidence of water vole (*Arvicola amphibius*) activity by looking for the following signs, in line with Dean M, Strachen R, Gow D and Andres R (2016). *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series).* Eds Fiona Mathews and Paul Chanin. The mammal Society, London: -

* Water vole burrows.
* Water vole faeces and latrines.
* Water vole feeding stations.
* Water vole runs.
* Water vole prints in areas of soft mud.
* Water vole lawns.
* Predator field signs.

2.5. The survey area was searched for watercourses and where found all watercourses within the survey area and for approximately 50m in each direction were thoroughly searched for evidence of otter (*Lutra lutra*) activity by looking for the following signs in line with the P Chanin (2003). *Monitoring the Otter* and *Conserving Natura 2000 Rivers: Monitoring Series No10 Guidelines: -*

* Otter prints in soft mud.
* Otter spraints.
* Otter Holts.

2.6. The survey area was searched for watercourses and waterbodies. Where found, and where safe to enter the water, all were thoroughly searched for the presence of crayfish, for approximately 50m in each direction of the site, by searching under rocks and logs. Where stated, crayfish traps were also deployed into the watercourse. All survey work was carried out in accordance with the *Conserving Natural 2000 Rivers Monitoring Series No 1, Protocol for Monitoring the White Clawed Crayfish*.

2.7. The survey area was searched for trees and structures and where found these were checked for potential bat roosting sites in line with Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition)* by looking for the following signs: -

* Holes, cracks or crevices.
* Bat Droppings.

2.8. The subsequent dusk emergence survey was also conducted in accordance with Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition).* It was conducted by a sufficient number of surveyors to cover all areas of roosting potential, in suitable weather conditions from fifteen minutes before sunset to at least an hour and half after.

2.10. All surveyors were equipped with Batbox Duet bat detectors, or similar. The use of static recording devices such as Anabat SD2's was also utilised where appropriate.

2.11. The land immediately adjacent to the survey area was assessed for bat roosting potential and bat foraging potential. Connective routes and flight lines were also assessed whilst on site and using maps of the area.

2.12. The area within 500m of the survey site was cross referenced to maps to highlight all ponds close to the site. Where possible, all ponds identified were

accessed using agreed access or public rights of way to assess the potential for great crested newts (*Triturus cristatus*) to be present.

2.13. e-DNA test kits were ordered from Surescreen Scientifics to enable water samples to be collected from the ponds within 500m of the site. The water samples were subsequently taken by a surveyor who holds a suitable Natural England survey licence. The samples were taken to the guidelines outlined by Surescreen Scientific using suitable sterile equipment.

2.14. The water samples were then submitted to Surescreen Scientific for analysis. A report outlining the results of the analysis was provided to Whitcher Wildlife Ltd. The results have been outlined in this report.

2.15. The survey area was assessed for the potential for reptiles and suitable reptile habitats. Where applicable the area was also searched for the presence of reptiles.

2.16. Where appropriate, the habitat within and surrounding the survey area was searched for species such as hazel, oak, honeysuckle, bramble and other species which may provide potential habitat for hazel dormice (*Muscardinus avellanarius*). Field signs such as feeding remains and nests were also searched for where possible, in line with P Bright, P Morris and T Mitchell-Jones *The Dormouse Conservation Handbook 2nd Edition*.

2.17. Where appropriate, the area within and surrounding the survey area was assessed for its potential to house habitat for red squirrels. Field signs of red squirrels were searched for at least every 50m, looking for any dreys, feeding signs or sightings of red squirrels.

2.18. All surveys were carried out in line with the Chartered Institute of Ecological and Environmental Management (CIEEM) survey standards and advice.

2.19. This document is prepared in line with The National Planning Policy Framework (NPPF). This sets out the government policy on biodiversity and nature conservation and places a duty on Planning Authorities to give material consideration to the effect of a development on legally protected species when considering planning applications. The NPPF and the Planning Practice Guidance on “Natural Environment” also promote sustainable development by ensuring that developments take account of the role and value of biodiversity and that it is conserved and enhanced within the development.

2.20. This report is prepared in line with the Natural Environment and Rural Communities (NERC) Act that came into force on 1st Oct 2006. Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England.

2.21. The preliminary ecological appraisal was carried out by Alex White BSc, MSc, ACIEEM. Alex has had experience in a professional capacity as a Graduate Ecologist carrying out ecology and protected species surveys and Phase 1 Habitat surveys and joined Whitcher Wildlife in 2016 as a Wildlife Consultant. Alex holds Natural England Survey Licences for Great Crested Newts, Bats, Hazel Dormice and Barn Owls and is currently working towards gaining further Natural England survey licences. She also holds Scottish Natural Heritage and Natural Resources Wales Licences for Great Crested Newts. She has successfully completed courses run by the Chartered Institute of Ecology and Environmental Management (CIEEM) and The Mammal Society to further her knowledge of protected species and plant identification. Alex is also an Associate member of CIEEM.

2.22. The subsequent bat dusk emergence survey and collection of water samples for great crested newt eDNA analysis were carried out by two surveyors:

Ruth Georgiou BSc MCIEEM. Since 2004 Ruth has had experience in a professional capacity as a Wildlife Consultant carrying out ecology surveys and phase I habitat surveys. As a full member of CIEEM Ruth is subject to peer review on an annual basis. Ruth holds Natural England survey licences in respect of bats, great crested newts and white clawed crayfish and has held her own or has been named ecologist on site specific licences for badgers, great crested newts and bats. She also holds a degree in Environmental Science (BSc) and has successfully completed a number of courses run by CIEEM, BCT and FSC in the relative protected species, carrying out phase I habitat surveys and BREEAM assessments.

And

James Campbell MCIEEM. Since 2003 James has had experience in a professional capacity as a Wildlife Consultant carrying out Ecology Surveys and Phase 1 Habitat surveys and is a full member of CIEEM. James holds licences with several licensing bodies including:-

- Natural England Survey Licences in respect of bats, great crested newts, white clawed crayfish, water voles and barn owls.

- Scottish Natural Heritage Licences in respect of bats and great crested newts.
- Natural Resources Wales Licences in respect of bats and great crested newts.

He has also successfully completed numerous courses run by CIEEM, BCT and FSC regarding protected species and in carrying out Phase 1 Habitat surveys. He is also confined spaces trained and qualified to NVQ Level 2 in tree climbing and aerial rescue.

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3. SURVEY RESULTS.

3.1. Data Search Results.

3.1.1. The Sheffield Biological Records Centre were contacted to carry out a 2km radius data search for records of protected species and designated sites within or adjacent to the survey area.

3.1.2. The following recent relevant records were returned:

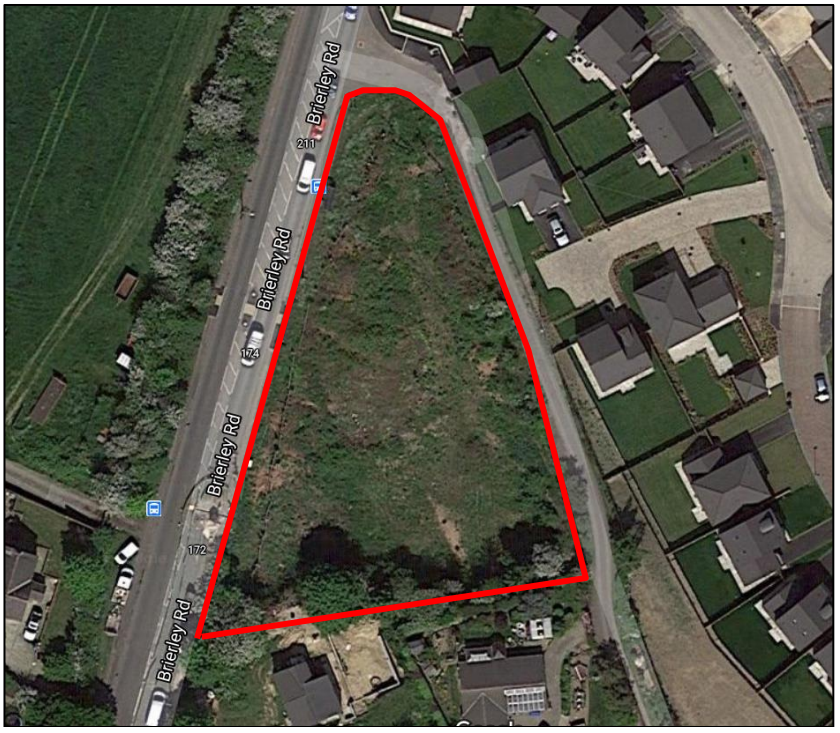
- Three records of grass snake, the closest two were recorded approximately 2km south west of the survey area in 2016.
- Badger have been recorded within 1.6km of the survey area; no further information will be provided due to the sensitive nature of this record.
- Twenty-four records of water vole, the closest was approximately 0.4km east of the survey area and was recorded in 2012.
- Brown long eared, noctule, soprano pipistrelle and common pipistrelle bats were recorded within 2km of the survey area; none of these records were related to the survey area.
- Common frog was recorded approximately 0.2km east of the survey area in 2011.

3.1.3. There were no statutory or non-statutory designated sites within 2km of the survey area. There was one Local Nature Reserve, one Wildlife Site and a Site of Special Scientific Interest within 2km of the survey area although all of these sites were over 1.8km from the survey area.

3.1.4. The data search is available to the client on request.

3.2. The Surveyed Area.

3.2.1. The survey area included an area of land off Brierley Road in Grimethorpe. The aerial photograph below highlights the survey area in red.



3.2.2. The current status of the site includes recently disturbed bare ground with materials. There is a defunct hedgerow and areas of scrub, occasional scattered trees and grassland around the edges of the site. The southern and eastern boundaries are higher in topography with the site sloping down to Brierley Road. The photographs below show the current status of the site.

3.2.3. The aerial maps below highlight the previous vegetation on the site. From a review of aerial photography it appears this site was cleared in 2018 and the regeneration occurred in 2019/2020 and it has been cleared again since.

3.2.4. The survey area is situated on the edge of Grimethorpe with propeties, including a recent development, to the south, east and north and arable land to the west. The aerial map below highlights the location of the survey area within the wider landscape.

3.3. Description of Habitats.

3.3.1. Appendix V of this report contains annotated maps marked up with the varying habitats that are cross referenced to target notes in Appendix VI of this report. The habitats on and adjacent to the site are: -

- Bare Ground
- Defunct Species – Poor Hedgerow
- Dense Scrub
- Mixed Scattered Trees
- Semi-Improved Neutral Grassland
- Rock Exposure
- Fence

3.3.2. ***Bare Ground***: The area appears to have been stripped twice from aerial photograph and currently a large proportion of the survey area supports a large amount of recently disturbed land.

3.3.2.1. There was a large area of brash, stone piles and materials on site (**T1** – **T3**).

3.3.3. ***Defunct Species – Poor Hedgerow***: There was a length of defunct hedgerow along the eastern boundary, which separated the access track from the site. The species included: hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), elder (*Sambucus nigra*), holly (*Ilex aquifolium*), dog rose (*Rosa canina*), bramble (*Rubus fruticosus*), cotoneaster (*Cotoneaster horizontalis*), bracken (*Pteridium aquilinum*) and ivy (*Hedera helix*).

3.3.4. ***Dense Scrub***: There were small areas of scrub around the southern and eastern areas of the site. The species included: hawthorn (*Crataegus monogyna*), ash (*Fraxinus excelsior*), elder (*Sambucus nigra*), bramble (*Rubus fruticosus*), common nettle (*Urtica dioica*) and ivy (*Hedera helix*).

3.3.5. ***Mixed Scattered Trees***: Occasional mixed trees were located around the top of the rock exposure, all of which were immature and semi-mature, the species included: silver birch (*Betula pendula*), Scot's pine (*Pinus sylvestris*), Leyland cypress (*Cupressocyparis leylandii*), ash (*Fraxinus excelsior*) and hawthorn (*Crataegus monogyna*).

3.3.6. ***Semi-Improved Neutral Grassland***: There were small strips of grassland adjacent to the access track and along Brierley Road. The species present included: Yorkshire fog (*Holcus lanatus*), perennial ryegrass (*Lolium perenne*), cock's foot (*Dactylis glomerata*), fescue (*Festuca* sp.), common daisy (*Bellis perennis*), common nettle (*Urtica dioica*), ground ivy (*Glechoma hederacea*), herb Robert (*Geranium robertianum*), cow parsley (*Anthriscus sylvestris*), ivy (*Hedera helix*), bramble (*Rubus fruticosus*), dandelion (*Taraxacum officinale*), meadow cranesbill (*Geranium pratense*), cleavers (*Galium aparine*), groundsel (*Senecio vulgaris*) and broadleaved willowherb (*Epilobium montanum*).

3.3.7. ***Rock Exposure***: The site is situated lower than the surrounding land to the south and east and rocks were present around part of this difference.

3.3.8. ***Fence***: The southern boundary featured wooden fencing along the residential properties.

3.4. Description of Fauna.

3.4.1. The site was assessed as unsuitable for badgers due to how disturbed the land is and the urban nature of the surrounding land. The vegetation removal has also left the site open and exposed. No badger setts, or their field signs, were identified during the survey.

3.4.2. There were no watercourses within, or close to, the surveyed area. Therefore, there is no suitable habitat for water vole, otter or white clawed crayfish.

3.4.3. All of the trees within the surveyed area were assessed as having negligible bat roost potential as they lacked suitable features such as rot and knot holes, lifted bark and storm damage.

3.4.4. The rock exposure features cracks and crevices and was of a height suitable for roosting bats. No full investigation of the suitable voids could be undertaken due to the height of the rock exposure. The photographs below highlight the cracks and crevices present between the rocks.

3.4.5. The surveyed area provides limited suitability for foraging and commuting bat. Therefore, the surveyed area was assessed as having low suitability for foraging and commuting bats in accordance with the Bat Conservation Trust Good Practice Guidelines.

3.4.6. The site survey and review of Ordnance Survey maps and aerial photography highlighted one pond within 500m of the surveyed area. Water samples were taken from the pond on 7th June 2021 and sent for eDNA analysis to determine presence or absence of great crested newts in the pond. The results were negative, and the

Technical Report is provided within Appendix VII. There is, therefore, no need for further consideration as this species will not be affected by the proposed works.

3.4.7. The scrub, trees and rock exposure are suitable for nesting birds although no full nesting bird survey was carried out as the ecological appraisal was carried out outside of the nesting bird season.

3.4.8. The majority of the site was assessed as having low value for reptiles although the more mature vegetation, rock exposure, brash and piles of materials could be suitable for reptiles. There are records of grass snake within the data search although the survey area is in a built-up area and therefore, it is considered unlikely any reptiles would be present.

3.4.9. The surveyed area is outside of the known UK distribution for hazel dormouse and red squirrels; therefore, these species will not be affected by the proposed works.

3.4.10. Cotoneaster, a non-native invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act (1981), was identified on the eastern boundary of the site. The photograph below highlights the cotoneaster plants on site.

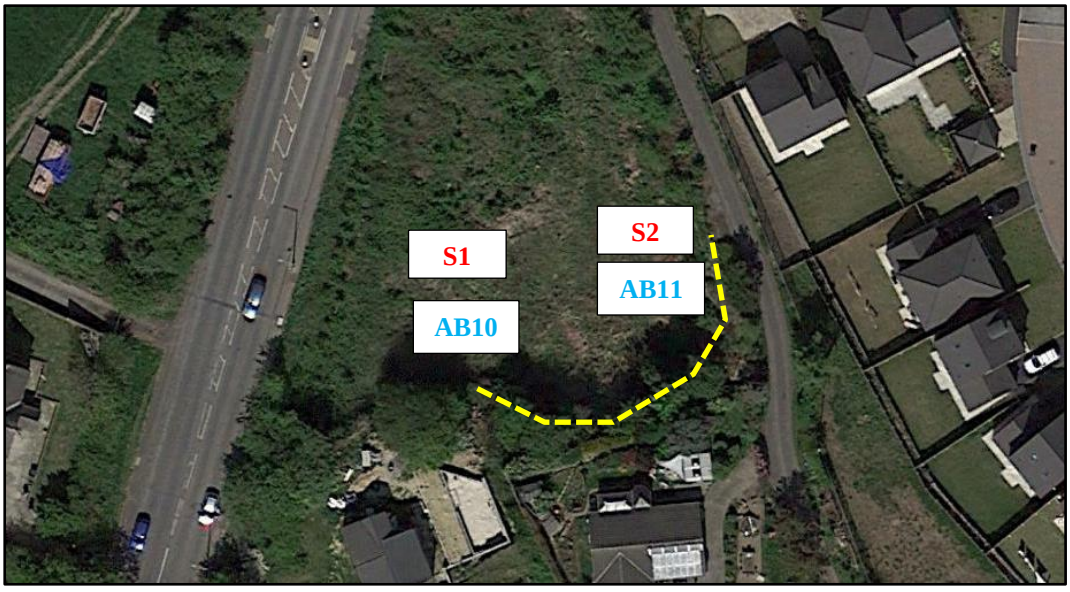
3.4.11. The mosaic of habitats, including brash piles, provide ideal habitat for hedgehogs. No hedgehogs were identified during the survey.

3.5. Bat Dusk Emergence Survey Results – 7th June 2021.

3.5.1. A dusk emergence survey was carried out the rock face. The weather during that survey was fine, clear and dry. A temperature of 17°C was recorded at 21:30. There was no wind throughout the survey. Dusk was at 21:31, therefore the dusk emergence survey commenced at 21:15 and was terminated at 23:00.

3.5.2. The survey was carried out by two surveyors, both surveyors were equipped with Batbox duet detectors and a two way radio for communication throughout the survey. Anabat detectors were also placed next to each surveyor to record any bat activity.

3.5.3. The locations of each surveyor (S) and Anabat (AB) are shown in the aerial map below.



3.5.4. Both surveyors observed and heard the same bat activities as outlined below:

21:56 – Noctule flew over south to north.
22:00 – A Common Pipistrelle bat was seen and heard foraging along the lane to the east of the survey area. This continued to the end of the survey.

3.5.5. Anabat 10 placed near Surveyor 1 recorded one noctule call at 21:56 and ten Common Pipistrelle bat calls between 22:12 and the end of the survey.

3.5.6. Anabat 11 placed near Surveyor 2 recorded forty Common Pipistrelle bat calls from 22:00 to the end of the survey.

3.5.7. No bats were seen to emerge from the rock face during the survey.

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4. ASSESSMENT OF IMPACTS, MITIGATION AND RESIDUAL EFFECTS.

4.1. Designated Sites.

There are no statutory designated sites or local nature reserves in the surveyed area itself or within a 2km search buffer. Therefore, the proposed development will have **No Negative Impact** on such sites.

4.2. Habitats.

4.2.1. Assessment

4.2.1.1. The site is predominantly bare ground with a single length of hedgerow, occasional scattered trees and small areas of scrub with grassland verges.

4.2.1.2. The vast majority of the site is bare ground and small areas of short grassland and provides little ecological value although this appears to have been cleared for the sale and development of the land and the original value of the site would have been higher than this. For the purpose of the Biodiversity Calculation a mixed scrub has been used for the baseline as this is what is present on aerials recently for the site, before it was cleared in preparation for the development.

4.2.1.3. The scrub and hedgerow were assessed as having moderate ecological value. Furthermore, any length of hedgerow is assessed as being a NERC Priority Habitat.

4.2.1.4. The total Baseline Biodiversity Units on the site are shown in the table below.

Habitat Type	Area in ha.	Distinctiveness	Condition Assessment	Biodiversity Units.
Mixed Scrub (Part of this habitat is retained)	0.26	Fairly Poor	Moderate	1.56
Neutral Grassland	0.02	Medium	Fairly Poor	0.12
Tree	0.04	Low	Moderate	0.24
Total	**0.31**			**1.92Bu**

4.2.1.5. In addition, the small length of hedgerow within the scrub provides the additional linear habitat Biodiversity Value of 0.20Bu as shown below.

Habitat Type	Length in km.	Distinctiveness	Condition Assessment	Biodiversity Units.
Native species hedgerow.	0.10	Low	Poor	0.20Bu
Total	**0.10**			**0.20Bu**

4.2.2. Mitigation.

4.2.2.1. The development plans show areas of a variety of grassland and planting has been created, in addition to the retained vegetation on the site. The additional planting includes trees, bulbs and ornamental plants. The full plan is appended to this report.

4.2.2.2. These measures will result in the following Biodiversity Value post development, which provide a Biodiversity Value of 0.98Bu.

Habitat Type	Area in ha.	Distinctiveness	Condition Assessment	Biodiversity Units.
Sealed Surface	0.08	N/A	N/A Other	0Bu
Urban amenity grassland	0.06	Low	Moderate	0.22Bu
Modified Grassland	0.05	Low	Moderate	0.14Bu
Introduced Shrub	0.01	Low	Moderate	0.04Bu
Mixed Scrub	0.07	Medium	Fairly Good	0.59Bu
Total	**0.27**			**0.98Bu**

4.2.2.3. In addition to the above, nineteen trees will also be planted. Due to an error in the matrix these could not be added on the sheet but are shown in the table below.

Habitat Type	Area in ha.	Distinctiveness	Condition Assessment	Biodiversity Units.
Street Tree	0.042	Low	Moderate	**0.16Bu**

4.2.2.4. In addition, lengths of native hedgerow are to be planted. This provides the additional linear habitat Biodiversity Value of 1Bu as shown below.

Habitat Type	Length in km.	Distinctiveness	Condition Assessment	Biodiversity Units.
Native species hedgerow.	0.3	Low	Moderate	1Bu
Total	**0.3**			**1Bu**

4.2.2.5. Any landscaping will use native plant species, or species that are of benefit to wildlife. A mix of some of, or all of the following species will be used: holly *(Ilex aquifolium)*, native honeysuckle *(Lonicera periclymenum)*, elder *(Sambucus nigra)*, hazel *(Corylus avellana)*, hawthorn *(Crataegus monogyna)*, blackthorn *(Prunus spinosa)*. These species will be of benefit to invertebrates, birds and bats.

4.2.3. Residual Effects.

The Biodiversity units across the categories from the p[resent to post development increases from 2.12Bu to 2.14Bu. However, as this is a small and confined site this is a combination of area habitats and linear habitats. This results in an overall increase of 0.09% overall. This represents a **Low Positive Residual Impact** on the at a **Site Level** when you take into account area and linear habitats combined.

4.3. Fauna – Badgers.

4.3.1. Assessment.

There were no badger setts, or badger field signs, identified within the surveyed area. Therefore, this species will not be directly affected by the proposed works although badgers could venture onto site during the proposed works and become trapped in any open excavation.

4.3.2. Mitigation.

No excavations will be left uncovered overnight or mammal ramps will be installed. This will prevent any badgers, hare or other animals, that may venture on site during the works from becoming trapped. Any excavations will be checked by site personnel at the start of each shift.

4.3.3. Residual Effect.

These precautions will ensure there will be a **No Negative Residual Impact at Site Level** on badgers.

4.4. Fauna – Foraging and Commuting Bats.

4.4.1. Assessment.

The boundaries of the site could be utilised as foraging and commuting habitats although full transect surveys were not considered necessary as the proposed development plan is sympathetic and will not cause any fragmentation.

4.4.2. Mitigation.

4.4.2.1. All boundary hedgerows and trees will be retained and there will be enhancements through the landscaping on site.

4.4.2.2. A sympathetic lighting scheme will be designed for the site to minimise light impact on bat foraging routes. Lighting will be kept to the minimum required for safety and will comprise down lighting only. As far as possible lighting will be designed to only be on for the minimum period of time and to turn off overnight.

4.4.3. Residual Effect.

Retention of habitats and sympathetic lighting will ensure there will be a **Low Negative Residual Impact at Site Level** on commuting and foraging bats.

4.5. Fauna –Reptiles.

4.5.1. Assessment.

4.5.1.1. The surveyed area provides suitable habitat for reptiles, although given the location of the survey area and the large among of bare ground, no further surveys are considered necessary.

4.5.2. Mitigation.

4.5.2.1. All site personnel should be briefed on the potential presence of reptiles; a Toolbox talk has been appended to this report to aid the briefing process. In advance of works, any debris, vegetation or refugia to be removed from the ground must be done so by hand wherever possible to allow any animals seeking refuge below to remain unharmed and move away from site of their own accord.

4.5.2.2. Site clearance will be undertaken during the summer months when reptiles are active. All vegetation clearance carried out to a minimum height of 150mm to allow any animals below to remain unharmed and move away from site of their own accord.

4.5.2.3. No materials to be stored on site for long periods of time (overnight). Any materials, which must be stored, must be raised off the ground.

4.5.2.4. Should a large number of reptiles, (5+) be identified, all works must cease, and professional advice sought.

4.5.3. Residual Effect.

Working to the above precautions, no reptiles will be killed or injured, and the habitat enhanced to provide additional hibernacula. This will ensure there is **No Negative Residual Impact at a Site Level** on reptiles

4.6. Fauna – Nesting Birds.

4.6.1. Assessment.

The surveyed area is suitable for nesting birds due to vegetation on the boundary and brash piles. Vegetation clearance works carried out during the nesting season will potentially have a **High Impact on nesting birds at a Site Level.**

4.6.2. Mitigation.

Any vegetation clearance in the nesting season will be preceded by a nesting bird survey by a suitably experienced ecologist and any active nests found will be left undisturbed until the young have fledged.

4.6.3. Residual Effect.

Following the mitigation above, there will be **No Negative Residual Impact at a Site Level** on nesting birds.

4.7. Fauna - Hedgehogs.

4.7.1. Assessment.

The brash piles on site are suitable for hedgehogs and any site clearance works, particularly to the brash piles, could have a **High Impact** on this species at a **Site Level.**

4.7.2. Mitigation.

The removal of the brash piles will be done by careful hand clearance during the summer months under the supervision of an ecologist to ensure no hedgehogs are harmed. Under no circumstances will these habitat piles be set fire too.

4.7.3. Residual Effect.

Following the mitigation above, there will be **No Negative Residual Impact at a Site Level** on hedgehogs.

4.8. Flora – Invasive Species.

4.8.1. Assessment.

Cotoneaster, a non-native invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act (1981), was identified on the eastern boundary of the site. This species is spread via its long-lasting red berries. Any works within this area could have a **High Impact** on the spread of this species at a **Site Level**.

4.8.2. Mitigation.

If works are required within the area of cotoneaster, these works will be undertaken carefully ensuring no berries are spread. Any berries or soils around these plants will be disposed of as contaminated waste.

4.8.3. Residual Effect.

Following the mitigation above, there will be **No Negative Residual Impact at a Site Level** on the spread of invasive species.

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5. COMPENSATION AND ENHANCEMENT MEASURES.

5.1. To enhance and mitigate for the losses on site, two bat boxes and two bird boxes will be installed at suitable locations are shown below.

KEY

Bat Box.

Bird Box.

5.2. Two bat boxes of a suitable inbuilt design are included in the building designs. The Habibat in-built bat brick, or similar, will be used to ensure roosting opportunities remain post development. These bat boxes will be situated at least 4m high and on to south and south easterly facing aspects.

5.3. As bird nesting opportunities will be reduced due to the development, two bird boxes of inbuilt design will be incorporated into the building designs. The Habibat Bird Nest Box, as shown below, is recommended.

5.4. Given that the site is suitable for hedgehogs, any boundary fencing will include holes at ground level at suitable points along all fence lines. Lifted gates and habitat piles will also be included. The minimum size for holes within the fence panels is 13cm and the minimum size for a lifted gate is 15cm. This will ensure lost habitat is mitigated for and that access can remain to all aspects of the site.

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Prepared by:	
Alexandrea White BSc MSc ACIEEM.	Date: 22nd June 2021.
Revised by:	
Alexandrea White BSc MSc ACIEEM.	Date: 1st July 2021.

Checked by:	
Derek Whitcher. BSc, MCIEEM, MCMI	Date: 2nd July 2021.

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Appendix I. BAT INFORMATION.

Ecology

There are currently 18 species of bat residing in Britain, 17 of which of which are known to breed here. They are extremely difficult to identify in the hand and even more so in flight.

All appear to be diminishing in numbers, probably due to habitat change and shortage of food, caused by pesticides, as insects are their sole diet.

As their diet consists solely of insects, bats hibernate during the winter when their food source is at its most scarce. They will spend the winter in hollow trees, caves, mines and the roofs of buildings.

Certain species, particularly the pipistrelle (the commonest and most widespread British bat) can quickly adapt to man-made structures and will readily use these to roost and to rear their young.

Surveys

During walkover surveys, bat roosts can be identified by looking for:

- Suitable holes, cracks and crevices within any building, tree or other structure.
- Bat droppings along walls, window cills, or on the ground.
- Prey remains, such as insect wings.

Further investigations can be made using endoscopes, by carrying out aerial inspections of trees or by conducting bat activity surveys during dusk and dawn over summer months.

Legislation

Bats are protected under Appendix II and III of the Bern Convention (1982), Schedule 5 and 6 of the Wildlife and Countryside Act (1981), Annex IV of the Habitats Directive (some species under Annex II), Annex II of the Conservation of Habitats and Species Regulations (2010) and EUROBATS agreement. Numerous species are also listed under section 41 of the Natural Environment and Rural Communities Act (2006) making them species of principal importance.

All bats and their roosts are therefore protected in the UK. This makes it an offence to kill, injure or take any bat, to interfere with any place used for shelter or protection, or to intentionally disturb any animal occupying such a place.

The UK has designated maternity and hibernacula areas as Special Areas of Conservation (SAC's) under the Habitats Directive. Implementation of the UK Biodiversity Action Plan also includes action for a number bat species and the habitats which support them.

Where development proposals are likely to affect a bat roost site, a licence is required from Natural England.

Appendix II. NESTING BIRD INFORMATION.

Ecology

The nesting season will vary according to the weather each year but generally commences in March, peaks during May and June and continues until September. It is also worth remembering that some birds nest in trees and scrub, but others are ground nesting or prefer man- made structures or buildings.

Surveys

Nesting bird surveys search for potential nest sites in vegetation, buildings etc. Potential nesting sites are observed over a suitable period of time for bird movements or calling male birds that would indicate the presence of a nest. The presence of a nest can be identified from the field signs without the necessity to see the nest itself, thereby avoiding any disturbance of the nests. The best way to avoid this issue is to plan for vegetation clearance to be carried out outside the bird-nesting season.

Legislation

Nesting birds are protected under The Wildlife and Countryside Act 1981.

Part 1. -(1) Of the Act states that: - If any person intentionally: - kills, injures or takes any wild bird; takes, damages or destroys the nest of any wild bird while that nest is in use or being built; or takes or destroys an egg of any wild bird, he shall be guilty of an offence.

Part 1.-(5) of the Act states that:- If any person intentionally:- disturbs any wild bird included in Schedule 1 while it is building a nest or is in, on, or near a nest containing eggs or young; or disturbs young of such a bird, he shall be guilty of an offence and liable to a special penalty.

The Countryside and Rights of Way Act 2000 amends the above by inserting after “intentionally” the words “or recklessly”.

Appendix III. REPTILE INFORMATION.

Ecology

There are five main species of reptile that reside in the UK; Common or Viviparous Lizard (*Lacerta vivipara*); Sand Lizard (*Lacerta agilis*); Slow Worm *(Anguis fragilis*); Grass Snake (*Natrix natrix*) and Adder (*Vipera berus*). The Adder is the only native species that is venomous although this is rarely harmful to humans.

Reptiles occupy a wide range of habitats including woodland, marshes, heathland, moors, sand dunes, hedgerows and bogs. Sand Lizards are confined to moorland and coastal sand dunes where they lay their eggs in the warm sand. The range of the Sand Lizard in the UK is therefore very limited. Slow Worms can be found in a wide variety of habitats throughout Britain and is the most likely reptile to be found in urban and suburban environments.

Maintaining the right body temperature is vital to reptiles' survival. In the morning, they find a warm basking site to heat up their bodies, then later they may move back into the shade because they do not sweat and have to be careful not to overheat. During hot summers, Adders will try to move to damper, cooler sites.

Over winter reptiles will hibernate in burrows or under longs where they are protected from the cold and predators, emerging from February onwards as the weather warms up.

Reptiles generally begin to mate April to May with young born in late July to September. The Common Lizard gives birth to live young, hence the term viviparous, meaning live bearing.

Surveys

Reptile surveys involve the searching of refuge such as logs and stones for any animal sheltering below. Artificial refuge may be laid out on site for the purpose of reptile surveys.

Legislation

Reptiles are protected under Appendix II (sand lizards) and Appendix III (common lizard, slow worms, smooth snake, grass snake and adders) of the BERN Convention (1982), partially protected under Schedule 5 of the Wildlife and Countryside Act (1981), Annex IV of the Habitats Directive and are all listed under section 41 of the Natural Environment and Communities Act (2006) making them a species of principal importance.

This makes it an offence to disturb any reptile while it is occupying a structure or place it uses for shelter or protection or to obstruct access to such a place.

Appendix IV. INVASIVE PLANT SPECIES INFORMATION.

Ecology

The Government has acknowledged the problems that can be caused by non-native invasive species. In 2008 the Government launched "The Invasive Non-Native Species Framework Strategy for Great Britain". The strategy provides a framework for a more co-ordinated approach to invasive species management. It seeks to create a stronger sense of shared responsibility across government, key organisations, land managers and the public.

The Non-Native Species Secretariat has been established to oversee the implementation of the strategy. Details of the secretariat including risk assessments and action plans for some species are available at www.nonnativespecies.org.

In general, there are four basic methods of controlling weeds; mechanical, chemical, natural and environmental.

- ***Mechanical control*** *includes cultivation, hoeing, pulling, cutting, raking, dredging or other methods to uproot or cut weeds.*
  Where this method is used all plant material must be considered "controlled waste" and must be disposed of properly.
- ***Chemical control*** *uses approved herbicides.*
- ***Natural control*** *uses pests and diseases of the target weed to weaken it and prevent it from becoming a nuisance.*
- ***Environmental control*** *works by altering the environment to make it less suitable for weed growth, for example by increasing or decreasing water velocity.*

Surveys

A site will be searched for invasive plant species growing on site, from mature plants to new shoots. A site will also be searched for dead stems indicating that plants that may have seasonally died back are present.

Legislation

Invasive species listed under Schedule 9 are prohibited from release into the wild. Schedule 9, Section 14(2) prohibits 'planting' or 'causing to grow' in the wild of any plant listed in Part 2 of Schedule 9.

The following is a list of all the species of plant listed under Schedule 9 of The Wildlife and Countryside Act 1981.

Common Name	**Scientific Name**	**England & Wales**	**Scotland**
Alexanders, Perfoliate	*Smyrnium perfoliatum*	✓	
Algae, Red	*Grateloupia luxurians*	✓	
Archangel, Variegated Yellow	*Lamiastrum galeobdolon subsp. Argentatum*	✓	
Azalea, Yellow	*Rhododendron luteum*	✓	
Balsam, Himalayan	*Impatiens glandulifera*	✓	
Cotoneaster	*Cotoneaster horizontalis*	✓	
Cotoneaster, Entire Leaved	*Cotoneaster integrifolius*	✓	
Cotoneaster, Himalayan	*Cotoneaster simonsii*	✓	
Cotoneaster, Hollyberry	*Cotoneaster bullatus*	✓	
Cotoneaster, Small Leaved	*Cotoneaster microphyllus*	✓	
Creeper, False Virginia	*Parthenocissus inserta*	✓	
Creeper, Virginia	*Parthenocissus quinquefolia*	✓	
Dewplant, Purple	*Disphyma crassifolium*	✓	
False-acacia	*Robinia pseudoacacia*		✓
Fanwort	*Cabomba caroliniana*	✓	✓
Fern, Water	*Azolla filiculoides*	✓	✓
Fig, Hottentot	*Carpobrotus edulis*	✓	✓
Garlic, Three-Cornered	*Allium triquetrum*	✓	
Hogweed, Giant	*Heracleum mantegazzianum*	✓	✓
Hyacinth, water	*Eichhornia crassipes*	✓	✓
Kelp, Giant	*Macrocystis angustifolia*	✓	✓
Kelp, Giant	*Macrocystis integrifolia*	✓	✓
Kelp, Giant	*Macrocystis laevis*	✓	✓
Kelp, Giant	*Macrocystis pyrifera*	✓	✓
Kelp, Japanese	*Laminaria japonica*	✓	✓

Knotweed, Giant	*Fallopia sachalinensis*	✓	
Knotweed, Hybrid	*Fallopia japonica x Fallopia sachalinensis*	✓	
Knotweed, Japanese	*Fallopia japonica*	✓	
Knotweed, Japanese	*Polygonum cuspidatum*		✓
Leek, Few-flowered	*Allium paradoxum*	✓	✓
Lettuce, water	*Pistia stratiotes*	✓	✓
Montbretia	*Crocosmia x crocosmiiflora*	✓	
Parrot's-feather	*Myriophyllum aquaticum*	✓	
Pennywort, Floating	*Hydrocotyle ranunculoides*	✓	
Potato, Duck	*Sagittaria latifolia*	✓	
Primrose, Floating Water	*Ludwigia peploides*	✓	
Primrose, Water	*Ludwigia grandiflora*	✓	
Rhododendron	*Rhododendron ponticum*	✓	
Rhubarb, Giant	*Gunnera tinctorial*	✓	
Rose, Japanese	*Rosa rugosa*	✓	
Salvinia, Giant	*Salvinia molesta*	✓	✓
Seafingers, Green	*Codium fragile*	✓	
Seafingers, Green	*Codium fragile tomentosoides*		✓
Seaweed, Californian Red	*Pikea californica*	✓	✓
Seaweed, Hooked Asparagus	*Asparagopsis armata*	✓	✓
Seaweed, Japanese	*Sargassum muticum*	✓	✓
Seaweeds, Laver (except native species)	*Porphyra sp. except -* *P. amethystea* *P. leucosticta* *P. linearis* *P. miniata* *P. purpurea* *P. umbilicalis*	✓	✓
Shallon	*Gaultheria shallon*		✓
Stonecrop, Australian swamp	*Crassula helmsii*	✓	✓
Wakame	*Undaria pinnatifida*	✓	✓
Waterweed, Curly	*Lagarosiphon major*	✓	✓
Waterweeds	*All species of the genus Elodea*	✓	

Appendix V. ANNOTATED MAP OF THE SURVEY AREA.

Legend

- Bare Ground
- Defunct Species - Poor Hedgerow
- Dense Scrub
- Mixed Scattered Tree
- Semi-Improved Neutral Grassland
- Rock Exposure
- Fence
- Target Note

Site: Windmill Hill Quarry
Reference: 210250

Prepared By: Alexandrea White
Date: 24th February 2021

Appendix VI. TARGET NOTES.

T1. Stone piles.

T2. Brash pile.

T3. Materials.

T4. Cotoneaster present.

T5. Cotoneaster present.

Appendix VII. eDNA TECHNICAL REPORT.

SureScreen Scientifics

Folio No: E10927
Report No: 1
Purchase Order: 210250
Client: WHITCHER WILDLIFE LTD
Contact: Ruth Georgiou

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 14/06/2021
Date Reported: 18/06/2021
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
5609	Windmill Hill Quarry	SE4079910045	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth **Approved by:** Chris Troth

Forensic Scientists and Consultant Engineers
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
Company Registration No. 08950940

SureScreen Scientifics

METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC: **Sample Integrity Check** [Pass/Fail]
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

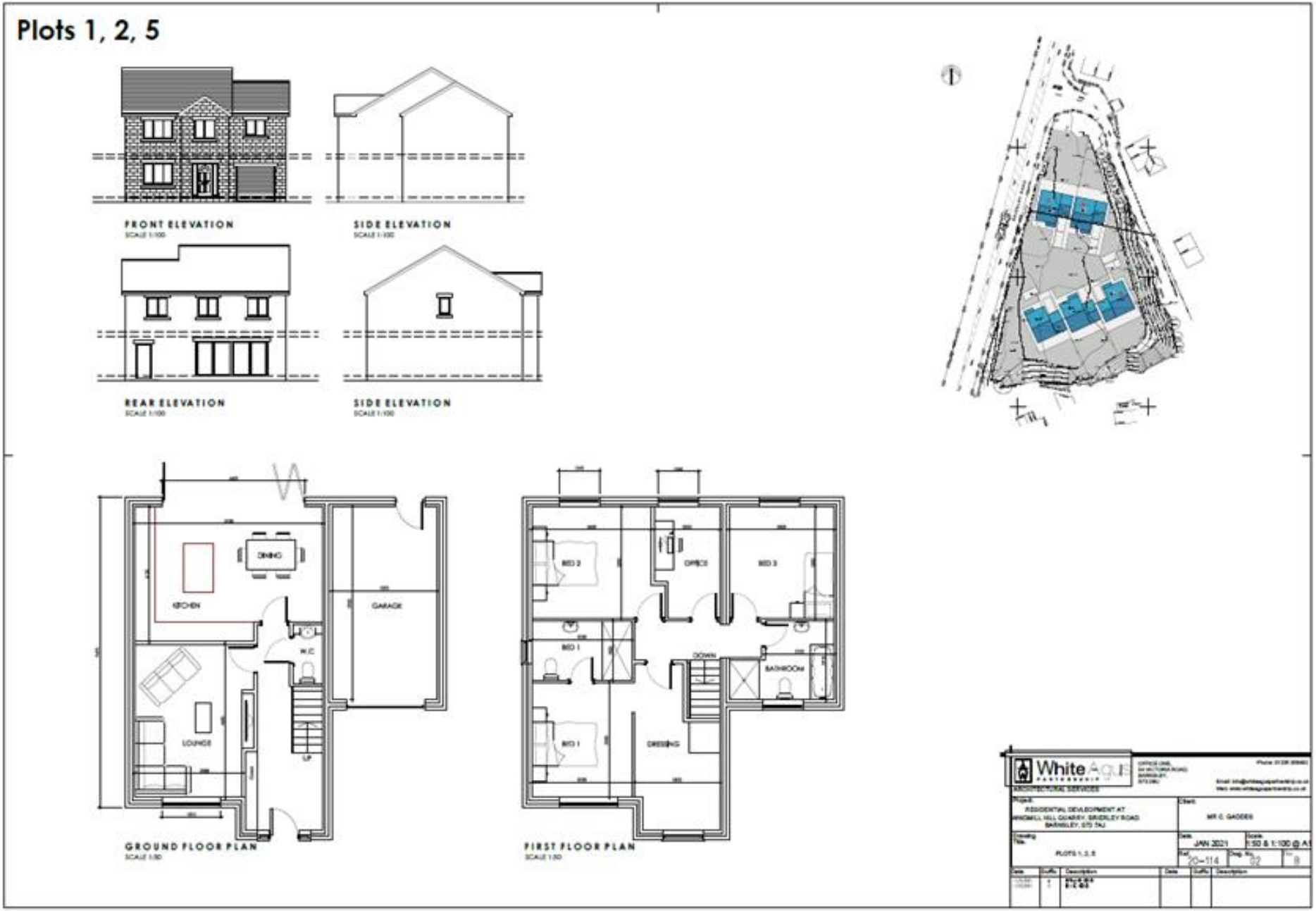
DC: **Degradation Check** [Pass/Fail]
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

IC: **Inhibition Check** [Pass/Fail]
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

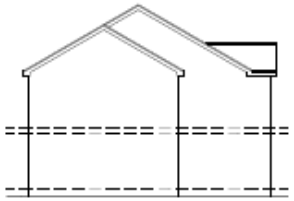
Result: **Presence of GCN eDNA** [Positive/Negative/Inconclusive]
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.

Forensic Scientists and Consultant Engineers
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
Company Registration No. 08950940

Appendix VIII. DEVELOPMENT PLAN.

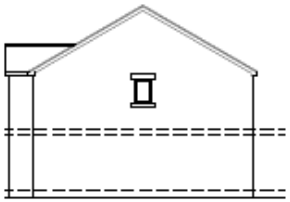


Plots 3, 4



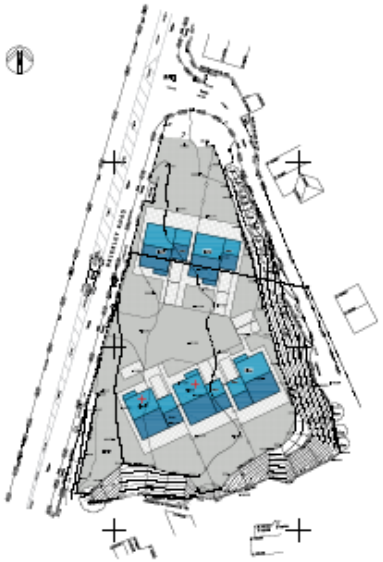
FRONT ELEVATION
SCALE 1:100

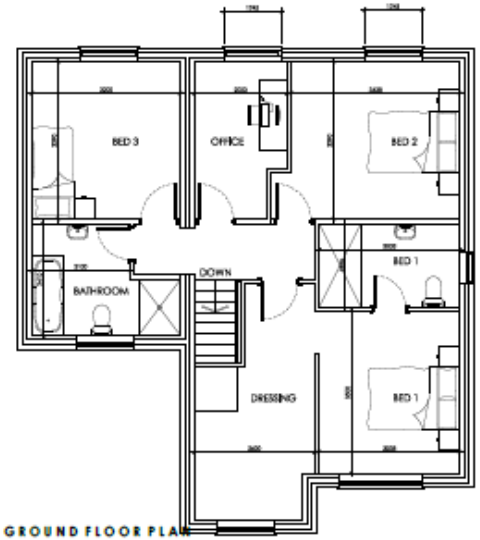
SIDE ELEVATION
SCALE 1:100



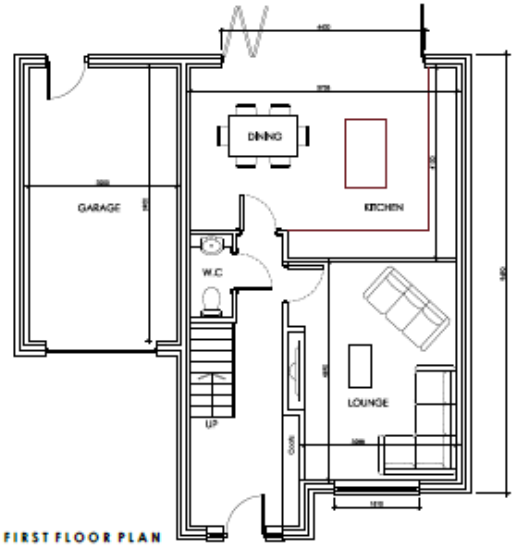
REAR ELEVATION
SCALE 1:100

SIDE ELEVATION
SCALE 1:100





GROUND FLOOR PLAN
SCALE 1:50



FIRST FLOOR PLAN
SCALE 1:50

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Project. RESIDENTIAL DEVLEOPMENT AT WINDMILL HILL QUARRY, BRIERLEY ROAD BARNSLEY, S72 7AJ	Client. MR C. GADDES
Drawing Title. PLOTS 3, 4	Date. JAN 2021 / Scale. 1:50 & 1:100 @ A1
	Ref. 20–114 / Dwg. No. 03 / Rev. B

Date	Suffix	Description	Date	Suffix	Description

Appendix IX. LANDSCAPING PLAN

Toolbox Talk: Reptiles

Whitcher Wildlife Ltd

Ecological Consultants

Identification: Grass Snakes.

The grass snake can be up to 120cm long. It is generally dark green in colour but may occasionally appear grey with vertical black bars and spots that run along its sides. There is usually a yellow marking around the neck.

Identification: Adders.

The adder is the only native species that is venomous, but it is rarely harmful to humans. Adult adders are generally up to 66cm long. Back ground colouration is a light shade of grey or brown with a black zigzag marking along the length of the back. As with all reptiles, colouration varies and becomes duller as sloughing (skin shedding) approaches.

Identification: Slow Worms.

Slow worms grow to around 45cm in length. The males and females display a marked difference in colour when fully grown. In general, the species displays colouring that varies from light brown, dark brown, grey, bronze or brick red with the females often displaying a dark vertebral stripe and both males and females displaying occasional markings on the flanks.

Identification: Common Lizards.

Common lizards grow to around 16cm. They are grey brown to dark brown, often with a darker streak that may run the entire length of the spine. A continuous dark band bordered by light yellow or white spots is often seen on either side of the body. The underside of the males is egg yolk yellow to orange spotted with black. Females are yellowish grey.

Other Reptiles.

In addition to the reptiles outlined on this document, there are also two other reptile species in Great Britain, the smooth snakes and the sand lizard. These reptiles are a lot less common than the four species covered with the smooth snake being predominantly found on heathland in southern England and the sand lizard found throughout Great Britain in coastal dune areas.

These species are also afforded a higher level of protection because they are European Protected Species.

Habitat.

Maintaining the right body temperature is vital to reptiles' survival. In the morning they find a warm basking site to heat up their bodies and then later they may move back into the shade so as not to overheat. Hence, reptiles require a habitat that provides a range of suitable refugia for shelter such as dense vegetation, rubble or log piles, or crevices and open areas for basking such as bare ground, rocks or railway ballast shoulders. During hot summers reptiles may be found in damper, cooler sites. Reptiles hibernate, spending the winter in burrows or under logs protected from the cold and predators.

When disturbed in their natural habitat reptiles will usually move away quickly.

Legislation.

Reptiles are protected under Schedule 5 of the Wildlife and Countryside Act 1981. They received greater protection following reviews of the schedules published in 1988 and 1991. This means they are protected against intentional or recklessly killing and injuring and against sale or transporting for sale.

If reptiles are identified during works, stop all works and contact Whitcher Wildlife Ltd directly on 01226 753271 or at info@whitcher-wildlife.co.uk