

Denny to Wishaw Network Upgrade

Environmental Impact Assessment Report

Volume 3 Appendices

Appendix 8.11 Upgraded Lines Great Crested Newt Results

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Appendix 8.11

1.1 Introduction

This Appendix accompanies Chapter 8: Biodiversity of the EIA Report (Volume 1). It describes in detail the desk study and field survey carried out to establish baseline conditions in the Zone of Influence (Zol) of the Uprated Overhead Lines components of the Project with respect to great crested newt (GCN) *Triturus cristatus*¹.

This appendix is supported by the following figures located within Volume 2: Figures:

- Figure 8.1a: Non-Statutory Designated Sites
- Figure 8.8a: Great Crested Newt Habitat Suitability Assessment and eDNA Survey Results; and
- Figure 8.8b Great Crested Newt Population Assessment Results.

This appendix is also supported by the following annexes which are included at the end of this document:

- Annex I: GCN Habitat Suitability Index summary scores and eDNA Results;
- Annex II: Habitat Suitability Index assessment detailed results;
- Annex III: Initial and relabelled waterbody references; and
- Annex IV: SureScreen laboratory certificates.

For the purposes of this appendix, activities relating to the Uprated Overhead Lines are referred to as the “Works”, and the term “Site” is used collectively to refer to all areas where works are located.

Relevant legislation and national planning policy pertaining to the protected or notable mammal species are discussed in Chapter 8 Biodiversity.

Throughout this appendix, species are given their common and scientific names when first referred to and their common names only thereafter. All distances are cited as the shortest distance ‘as the crow flies’, unless otherwise specified. Locations are given as Ordnance Survey Grid References (OSGR).

1.2 Methodology

Desk study methods are as described in Volume 1, Chapter 8 Biodiversity.

As described in Volume 1, Chapter 8 Biodiversity, a mix of OS mapping and aerial imagery was reviewed to identify ponds potentially suitable for GCN within 250m from the Sites.

This was in line with Natural England guidance^{2,3} (as referenced by NatureScot⁴) which states that:

¹ The GCN methods and baseline results for other components of the project are detailed separately in Appendix 8.4 for the New Build Overhead Line, AA Route Undergrounding and CB Route Removal, and within the main chapter for the Substations.

² Natural England (2022). *Great crested newts: advice for making planning decisions*. Available from: [Great crested newts: advice for making planning decisions - GOV.UK](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/101411/great-crested-newts-advice-for-making-planning-decisions.pdf)

³ English Nature (2001). *Great Crested Newt Mitigation Guidelines*. Available from: <https://webarchive.nationalarchives.gov.uk/ukgwa/20140605121141/http://publications.naturalengland.org.uk/publication/810429?category=30014>.

⁴ [Standing advice for planning consultations - Great Crested Newts | NatureScot](https://www.nature-scot.gov.uk/guidance/standing-advice-for-planning-consultations-great-crested-newts)

“Surveys of water bodies within 250m of the development are usually sufficient. Developers may need to increase this to 500m if there are no obvious barriers to GCN dispersing into the wider environment.”

Additional studies have also found that great crested newts can use suitable terrestrial habitat up to 500m from a breeding pond but that there is a notable decrease in great crested newt abundance beyond 250m from a breeding pond^{5,6,7,8}.

Given the above and based on the landscape and topography of the Project and surrounding area (which often contains impediments to great crested newt dispersal such as major roads, large expanses of agricultural land, railways and rivers) it was considered that a buffer of 250m is appropriate when determining the potential presence of waterbodies and great crested newt populations which may be present.

All waterbodies found were assigned unique identifiers based on their proximity to the specific Works component (overhead line route) they are relevant to. Each ID begins with a two-letter prefix corresponding to the relevant overhead line section (e.g. ZG) (where ponds are relevant to both the XX and XR overhead lines, they have been named according to which line is nearest). Ponds were then numbered sequentially according to their geographical coordinates, following a north-to-south and east-to-west direction.

While ponds were initially assigned identifiers during the preliminary desk study, these were superseded to accommodate the discovery of additional waterbodies in the field and the exclusion of features that, upon ground-truthing, were confirmed not to be ponds and subsequently scoped out. Consequently, the SureScreen Scientifics laboratory reports utilize the initial field references, which may differ from the final waterbody references. A comprehensive cross-reference table, showing the initial desk-study waterbody references to the finalized references as presented in this appendix, is provided in Annex III.

Habitat Suitability Index Assessment

Habitat Suitability Index (HSI) assessment of ponds was carried out of the ZG Route ponds on 12 June 2025, the XX Route ponds between 12 and 18 June 2025, and the XR Route ponds on 19 June and 25 June 2025. A single additional waterbody (XR.GCN.20) identified during the protected species surveys received HSI assessment on the 15 October 2025. The HSI assessments were not conducted for waterbodies separated from the Site by significant dispersal barriers or otherwise significantly isolated. These barriers include major roads, large rivers, or significant areas of intensively managed agricultural land, which effectively isolate the waterbody from suitable habitats within the Site. The relevant justification relating to each pond are described in Annex II.

⁵ Franklin, P. (1993). The migratory ecology and terrestrial habitat preferences of the great crested newt *Triturus cristatus* at Little Wittenham Nature Reserve. M.Phil Thesis. De Montfort University. Dept. Applied Biology and Biotechnology.

⁶ Oldham, R.S. and Nicholson, M. (1986). Status and Ecology of the Warty Newt *Triturus cristatus*, Final Report. Report by Leicester Polytechnic under contract to Nature Conservancy Council, Contract No. HF 3/05/123 Year 3.

⁷ Jehle, R. (2000) The terrestrial summer habitat of radio-tracked great crested newts (*Triturus cristatus*) and marbled newts (*Triturus marmoratus*). *Herpetological Journal* 10(4), pp 137-142.

⁸ Jehle, R. and Arntzen, J.W. (2000). Post-breeding migrations of newts with contrasting ecological requirements. *Journal of Zoology*, London 251, pp 297-306.

The HSI assessment was carried out in accordance with the standard methodology described in Oldham *et al*⁹ and included field-based observations of the habitat attributes described below, in addition to the use of Esri ArcGIS software to calculate the surface area of the waterbodies.

HSI for great crested newt is a numerical index between 0 (indicating unsuitable habitat) and 1 (representing optimal habitat). The assessment sought to establish the suitability of the ponds for great crested newt and thus the potential that they would be used by the species for breeding.

HSI assessment considers the following ten habitat attributes that influence the suitability of a pond for breeding great crested newts:

- Location - within a UK-wide context reflecting the differences in national distribution of this species
- Area - waterbodies between 500-700m² in size are considered to represent the most suitable habitat for great crested newt
- Drying - the number of years in which a pond dries over a ten-year period. Occasional drying kills fish, which is beneficial for great crested newt, but the species predominantly favours ponds that do not dry out every year
- Water quality - qualitative evidence-based assessment to infer good (diverse aquatic invertebrate assemblage), moderate (moderate invertebrate diversity), poor (low invertebrate diversity, few submerged plants) or bad (clearly polluted) water quality
- Shade - percentage of pond perimeter shaded to at least 1m from the shore. Great crested newt favours lightly shaded waterbodies
- Waterfowl - qualitative evidence-based assessment of presence or absence and numbers is made. Large numbers of waterfowl can result in nutrient enrichment of the water and habitat damage, which is less favourable for great crested newt
- Fish – qualitative evidence-based assessment of likely presence or absence is made. Great crested newt favour breeding ponds that do not support fish because their open-water swimming larvae are vulnerable to fish predation
- Number of waterbodies within 1km - great crested newt populations are typically best developed where they have access to a network of ponds, and therefore the species is more likely to be found where there are several ponds within 1km that are linked by suitable terrestrial habitat and
- Macrophyte cover - percentage of pond surface area occupied by macrophyte cover. Female great crested newts require aquatic vegetation for egg-laying.

The ten field scores are converted into suitability index scores which are multiplied together then calculated to the power of 0.1, to give a HSI score between 0 and 1.

HSI scores are categorised in terms of pond suitability for great crested newt as below:

⁹ Oldham, R.S., Keeble, J., Swan M.J.S. and Jeffcote, M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10(4), pp 143-155.

- <0.5 = Poor
- 0.5 to 0.59 = Below average
- 0.60 to 0.69 = Average
- 0.7 to 0.79 = Good
- >0.8 = Excellent

The system provides a useful indication of suitability but it is not sufficiently precise to conclude that any particular waterbody with a high score will definitely support great crested newt, or that a waterbody with a low score will not support the species. Oldham *et al.* (2000)⁹ reported that the lowest scoring pond supporting great crested newt in their study was 0.43.

Environmental DNA sampling

Environmental DNA (eDNA) is nuclear or mitochondrial DNA that is released from an organism into the environment¹⁰. In aquatic environments, eDNA is diluted and distributed in the water. Sources of eDNA in pond water derive from faeces, mucous, gametes, shed skin and carcasses. The eDNA survey involves the collection of water samples for laboratory analysis for the DNA of species of interest, in this case great crested newt. The sampling procedure is prescribed in the published method and requires that the water sample be taken between mid-April and end of June.

Concurrently with the HSI assessments (12 to 25 June 2025), eDNA sampling was carried out for waterbodies within 250m of the Site that were not separated from the works by dispersal barriers or significantly isolated from other ponds via intensively managed agricultural land.

Samples were collected from the waterbodies following approved field and laboratory protocols¹⁰. Waterbodies were not entered by surveyors during sample collection and new sterile equipment provided by the laboratory was used to collect each water sample to prevent contamination between waterbodies. A total of twenty sub-samples of 30 ml each were collected from around the periphery of each waterbody and mixed together before transferring the samples to six laboratory-supplied test tubes, which were then shaken. Samples were collected by trained and experienced AECOM ecologists (in Scotland it is not necessary for those taking water samples for great crested newt eDNA analysis to hold a survey licence for this species).

Where ponds were very close in proximity, or where there was obvious water exchange, and laboratory protocols allowed (e.g. regarding total surface water area), a single eDNA sample was sometimes taken using water from more than one pond.

The collected samples were then transported to SureScreen (a laboratory which takes part in Natural England's eDNA proficiency testing scheme) for analysis to confirm the presence or likely absence of great crested newt eDNA.

¹⁰ Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R.A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. and Dunn, F. (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust, Oxford

Where a negative result was obtained from the eDNA analysis, further surveys using traditional methods were not undertaken, as a negative result from this method provides a detection rate of 99%¹¹.

Should a positive eDNA result have been returned, ponds would have been subject to further surveys using the traditional methods described by Natural England¹². This is because eDNA can only be used in establishing presence or absence and does not provide a population estimate.

The locations of all waterbodies subject to eDNA analysis are shown on Volume 2, Figure 8.8a.

Limitations

It is possible that additional waterbodies may exist within 250m of the Site which were not identified by the desk-based review of aerial images and OS mapping and which were not found during field survey. However, given the intensity of survey work completed, and areas covered, any additional waterbodies are expected to be at least 50m away from any work areas.

Waterbody XR.GCN.39 is located within a secured construction area to which there was no access. Therefore no eDNA sampling was carried out.

Pond XR.GCN.20 and Pond XX.GCN.12 were not found during the initial desk study and were therefore not subject to eDNA sampling, though they were assessed as having 'Below Average' and 'Average' HSI ratings, respectively. However, no other waterbodies within the wider area returned a positive eDNA result, indicating that ponds XR.GCN.20 and XX.GCN.12 are not connected to ponds which support the species. Connectivity between ponds is important for GCN³, given that they occur in meta-populations, and a lack of connectivity to positive ponds reduces the likelihood that a pond would support the species. The lack of positive eDNA results as a whole (for this component of the project) suggests a broader absence of the species across the Site and Zol. Thus the species is considered absent from these ponds, and the lack of survey is not considered a significant limitation.

1.3 Baseline Conditions

Desk Study

There are no internationally designated sites for GCN within 10km of the Site, nor are there any nationally designated sites within 2km of the Site.

The NBN Atlas Scotland provided three records of GCN within 1km of the Site, all located within the immediate vicinity of Gartcosh Local Nature Reserve. Two of the records are from 2017; one identified as a juvenile, located 800m north of the XX Route and an adult 900m north of the XX Route. One record from 2022 is not classified and located approximately 1km north of the XX Route.

¹¹ <https://sciencesearch.defra.gov.uk/ProjectDetails?ProjectID=18650>

¹² Natural England (2015). Great crested newts: surveys and mitigation for development projects. Standing advice for local planning authorities who need to assess the impacts of development on great crested newts. Available from: <https://www.gov.uk/guidance/great-crested-newts-surveys-and-mitigation-for-development-projects>.

The Amphibian and Reptile Groups of UK (ARGUK)¹³ returned five records of great crested newt from within 1km of the Site:

- Three adults recorded in 2015 within a 1km grid square at Gartcosh Local Nature Reserve, 400m north-west of the XX Route.
- One adult recorded in 2018 within a 1km grid square, in farmland south of Glenboig, 200m south of the XX Route.
- One adult recorded in 2016 within a 1km grid square, within the north-west corner of Coatbridge, 600m south of the XX Route.

Great Crested Newt are also listed as key priority species in the Falkirk Council¹⁴ and North Lanarkshire Council¹⁵ Biodiversity Action Plans.

The initial desk-based assessment identified 90 potential waterbodies which were taken forward to field survey stage.

Field Survey

Of the 90 waterbodies identified during the desk study, several were found to no longer be present during field survey, and an additional thirteen ponds were recorded. Thus, 79 confirmed waterbodies are present within the Zol of the Site as follows: seven ponds along the ZG Route, 30 within the XX Route, and 42 within the XR Route. Of these, 25 were scoped out of further survey due to the presence of significant dispersal barriers or functional isolation separating them from the Site / any possible impacts.

Habitat Suitability Index and eDNA sampling

HSI assessments were conducted for 54 waterbodies.

The HSI screening classified the waterbodies as follows:

- fifteen 'Poor';
- eleven 'Below Average';
- sixteen 'Average';
- seven 'Good' and
- five 'Excellent'.

As set out in Section 1.3, based on the lack of dispersal barriers and lack of functional isolation, 46 ponds were scoped in for eDNA sampling. All eDNA analysis returned negative results, with zero positive replicates recorded across all samples (0/12). These results indicate a likely absence of great crested newts within the surveyed areas.

Table X.X below within Annex I details all 79 ponds present within the Zol of the Site. It includes a summary of the HSI results and the eDNA results where these surveys were

¹³ The Amphibian and Reptile Groups of UK (ARGUK), <https://www.recordpool.org.uk/index.php>

¹⁴ A Biodiversity Action Plan for the Falkirk Council Area (2019), Falkirk Council
<https://fcwebsites.blob.core.windows.net/www/media/cc12cee9-df25-46f7-9f8b-8ec2e2287edf/Second%20Nature%20-%20A%20Biodiversity%20Action%20Plan%20for%20the%20Falkirk%20Council%20Area.pdf>

¹⁵ North Lanarkshire Biodiversity Action Plan 2023 - 2027, North Lanarkshire Council
<https://www.northlanarkshire.gov.uk/sites/default/files/2023-04/Biodiversity%20action%20plan%202023-2027%20%28Accessible%29.pdf>

completed. Comprehensive details of the HSI scoring parameters and site photographs, are contained within Annex II and details of the SureScreen laboratory result certificates are provided in Annex IV.

1.4 Summary

In total, of the 79 ponds identified during the field surveys, 54 were subjected to HSI assessments, with results ranging from 'Poor' to 'Excellent' suitability. Subsequently, 46 of these waterbodies were scoped in for eDNA testing; all samples returned negative results. Consequently, it is concluded that great crested newts are likely absent from the Site.

Annex I Habitat Suitability Index summary scores

Table A.1 GCN Habitat Suitability Index summary scores and eDNA Results

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
ZG Route						
ZG.GCN.01	0.51	Below Average	Negative	NS 82620 84555	Located 51m north of the ZG001 compound, 13m north of the proposed access track and 44m southeast of the pulling area.	
ZG.GCN.02	0.55	Below Average	Negative	NS 82660 84555	Located 51m north of the ZG001 compound, 13m north of the proposed access track and 44m southeast of the pulling area.	
ZG.GCN.03	0.55	Below Average	Negative	NS 82618 84557	Located 47m north of the ZG001 compound, 16m north of the proposed access track and 30m south of the pulling area.	
ZG.GCN.04	0.59	Below Average	Negative	NS 83625 82688	Located 25m east of the ZG001 compound, 18m east of the proposed access track and 198m of the scaffolding.	
ZG.GCN.05	0.70	Good	Negative	NS 82707 84538	Located 63m northeast of the ZG001 compound, 41m east of the	

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
					proposed access track and 91m southeast of the pulling area.	
ZG.GCN.06	0.71	Good	Negative	NS 82585 84300	Located 74m south of the ZG002 compound and 57m south of the proposed access track.	
ZG.GCN.07	0.19	Poor	Negative	NS 82725 84433	Located 95m southeast of the ZG001 compound, 16m south of the proposed access track and 123m south of the pulling area.	
XX Route						
XX.GCN.01	0.29	Poor	N/A	NS 70405 66948	Located 31m south of the XX001B tower compound, 27m south of the proposed access track and 24m of the pulling area.	Waterbody deemed unsuitable for GCN upon inspection in field due to its large size and fish and waterfowl presence.
XX.GCN.02	0.47	Poor	Negative	NS 70889 67284	Located 34m southeast of the XX003 tower compound and 42m east of the proposed access track.	
XX.GCN.03	0.44	Poor	Negative	NS 70944 67279	Located 74m southeast of the XX003 tower compound and	

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
					78m east of the proposed access track.	
XX.GCN.04	0.74	Good	Negative	NS 71847 67841	Located 146m north of the XX007 tower compound and 179m north of the proposed access track.	
XX.GCN.05	0.69	Average	Negative	NS 71966 67864	Located 184m northeast of the XX007 tower compound and 231m northeast of the proposed access track.	
XX.GCN.06	N/A	N/A	N/A	NS 72083 67883	Located 250m northeast of the XX007 tower compound.	Pond deemed too distant to Site to be at risk.
XX.GCN.07	0.59	Below Average	Negative	NS 71851 67791	Located 96m north of the XX007 tower compound and 129m north of the proposed access track.	
XX.GCN.08	0.31	Poor	Negative	NS 72371 67806	Located 178m northeast of the XX008 tower compound and 197m northeast of the proposed access track	

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
XX.GCN.09	0.69	Average	Negative	NS 72047 67661	Located 155m west of the XX007 tower compound and 176m west of the proposed access track.	
XX.GCN.10	0.69	Average	Negative	NS 72111 67663	Located 63m west of the XX008 tower compound and 78m west of the proposed access track.	
XX.GCN.11	0.45	Poor	Negative	NS 72036 67539	Located 73m southwest of the XX008 tower compound and 9m north of the proposed access track.	
XX.GCN.12	0.66	Average	N/A	NS 72106 67308	Located 22m south of the proposed access track.	
XX.GCN.13	N/A	N/A	N/A	NS 73760 68034	Located 224m northwest of the XX014 tower compound, 202m northwest of the proposed access track and 207m of the pulling area.	Distance from proposed works and existing physical barriers deemed sufficient to protect pond from Site works.
XX.GCN.14	N/A	N/A	N/A	NS 73748 67961	Located 189m northwest of the XX014 tower compound, 143m northwest of the proposed access track and 154m of the pulling area.	Distance from proposed works and existing physical barriers deemed sufficient to protect pond from Site works.

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
XX.GCN.15	0.34	Poor	Negative	NS 75548 68336	Located 46m southeast of the XX019 tower compound, 63m southeast of the proposed access track and 159m of the water crossing.	
XX.GCN.16	0.54	Below Average	Negative	NS 75800 68330	Located 14m east of the XX020 tower compound, 43m north of the proposed access track and 183m of the pulling area.	
XX.GCN.17	0.59	Below Average	Negative	NS 76083 67952	Located 8m west of the XX022 tower compound and 7m west of the proposed access track.	
XX.GCN.18	0.66	Average	Negative	NS 76515 67528	Located 95m northeast of the XX024 tower compound and 145m northeast of the proposed access track.	
XX.GCN.19	0.63	Average	Negative	NS 76646 67327	Located 29m northwest of the XX025 tower compound and 54m northwest of the proposed access track.	

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
XX.GCN.20	0.64	Average	Negative	NS 77744 66630	Located 30m west of the XX029 tower compound and 54m west of the proposed access track.	Both waterbodies sampled together for GCN eDNA.
XX.GCN.21	0.64	Average	Negative	NS 77766 66617	Located 6.2m west of the XX029 tower compound and 30m west of the proposed access track.	
XX.GCN.22	N/A	N/A	N/A	NS 77885 66257	Located 221m southwest of the XX030 tower compound and 190m southwest of the proposed access track.	Waterbodies separated by significant dispersal barriers. Details provided in Annex II.
XX.GCN.23	N/A	N/A	N/A	NS 78838 65925	Located 88m northwest of the XX025 tower compound, 76m of the proposed access track and 216m of the water crossing.	
XX.GCN.24	N/A	N/A	N/A	NS 79093 65242	Located 144m north of the XX033 tower compound and 54m of the proposed access track.	
XX.GCN.25	N/A	N/A	N/A	NS 78461 63221	Located 168m west of the proposed access track and 238m of the pulling area.	

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
XX.GCN.26	N/A	N/A	N/A	NS 78158 61585	Located 242m southwest of the XX046 tower compound.	
XX.GCN.27	N/A	N/A	N/A	NS 78193 61557	Located 229m southwest of the XX046 tower compound.	
XX.GCN.28	N/A	N/A	N/A	NS 78619 61359	Located 147m southeast of the XX047 tower compound and 123m southeast of the proposed access track.	
XX.GCN.29	0.5	Below Average	Negative	NS 78432 61237	Located 141m southeast of the XX047 tower compound and 173m southeast of the proposed access track.	
XX.GCN.30	0.69	Average	Negative	NS 78292 60823	Located 32m south of the XX048A tower compound, 52m south of the proposed access track and 164m of the pulling area.	
XR Route						
XR.GCN.01	0.86	Excellent	Negative	NS 78338 60781	Located 27m north of the tower compound, 37m northeast of	

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
					the proposed access track and 199m of the pulling area.	
XR.GCN.02	0.78	Good	Negative	NS 78411 60837	Located 76m northeast of the tower compound and 116m northeast of the proposed access track.	
XR.GCN.03	0.66	Average	N/A	NS 79447 60572	Located 24m north of the XR005 tower compound and 10m east of the proposed access track.	Dry at the time of survey hence no eDNA sampling has been carried out.
XR.GCN.04	0.62	Average	Negative	NS 79524 60520	Located 27m east of the XR005 tower compound and 87m east of the proposed access track.	
XR.GCN.05	0.65	Average	Negative	NS 79485 60433	Located 50m south of the XR005 tower compound and 109m south of the proposed access track.	
XR.GCN.06	0.42	Poor	Negative	NS 79562 60313	Located 108m northwest of the XR006 tower compound and 137m northwest of the proposed access track.	

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
XR.GCN.07	0.39	Poor	Negative	NS 79519 60296	Located 141m northwest of the XR006 tower compound and 171m northwest of the proposed access track.	
XR.GCN.08	N/A	N/A	N/A	NS 79397 60314	Located 180m southwest of the XR005 tower compound and 221m southwest of the proposed access track.	Separated by a significant dispersal barrier. Details in Annex II.
XR.GCN.09	N/A	N/A	N/A	NS 79352 60293	Located 219m southwest of the XR005 tower compound.	
XR.GCN.10	N/A	N/A	N/A	NS 79401 60279	Located 211m southwest of the XR005 tower compound.	
XR.GCN.11	0.82	Excellent	Negative	NS 79523 60079	Located 185m southwest of the XR006 tower compound, 78m southwest of the proposed access track and 147m of the visibility splay.	
XR.GCN.12	0.64	Average	Negative	NS 79633 60195	Located 26m southwest of the XR006 tower compound and 74m southwest of the proposed access track.	

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
XR.GCN.13	0.46	Poor	Negative	NS 79785 60253	Located 79m east of the XR006 tower compound and 1m of the proposed access track.	
XR.GCN.14	0.84	Excellent	Negative	NS 79980 60470	Located 185m north of the XR007 tower compound and 205m north of the proposed access track.	
XR.GCN.15	0.81	Excellent	Negative	NS 80011 60434	Located 144m north of the XR007 tower compound and 169m north of the proposed access track.	
XR.GCN.16	0.77	Good	Negative	NS 80045 60364	Located 73m north of the XR007 tower compound and 97m north of the proposed access track.	
XR.GCN.17	N/A	N/A	N/A	NS 80222 60286	Located 112m northwest of the XR008 tower compound, 43m northeast of the proposed access track and 122m of the water crossing.	Separated by significant dispersal barriers. Details available in Annex II.
XR.GCN.18	N/A	N/A	N/A	NS 80069 60072	Located 169m south of the XR007 tower compound, 158m south of the proposed access	

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
					track and 199m of the water crossing.	
XR.GCN.19	0.44	Poor	Negative	NS 80659 60103	Located 17m east of the XR009 tower compound, 17m east of the proposed access track and 77m of the visibility splay.	
XR.GCN.20	0.57	Below Average	N/A	NS 80884 60144	Located 36m north of the XR010 tower compound, 31m east of the proposed access track and 41m of the visibility splay.	
XR.GCN.21	N/A	N/A	N/A	NS 81590 59809	Located 126m south of the XR012 tower compound, 104m south of the proposed access track, 120m of the pulling area and 104m of the visibility splay.	Isolated by intensively managed agricultural land
XR.GCN.22	0.54	Below Average	N/A	NS 83803 58988	Located 81m north of the XR020 tower compound and 17m west of the proposed access track.	
XR.GCN.23	N/A	N/A	N/A	NS 84297 58096	Located 97m north of the XR023 tower compound, 126m north of the proposed access track and 103m of the visibility splay.	Significant dispersal barriers separating the waterbody from the Site. Details in Annex II.

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
XR.GCN.24	0.46	Poor	Negative	NS 84391 57999	Located 10m east of the XR023 tower compound, 35m east of the proposed access track and 19m of the visibility splay.	
XR.GCN.25	N/A	N/A	N/A	NS 84330 57688	Located 176m northwest of the XR024 tower compound, 142m north of the proposed access track and 63m of the visibility splay.	Significant dispersal barriers separating the waterbody from the Site. Details in Annex II.
XR.GCN.26	0.75	Good	Negative	NS 83540 55100	Located 151m northwest of the XR034 tower compound, 34m north of the proposed access track, 230m of the visibility splay and 110m of the water crossing.	
XR.GCN.27	0.67	Average	Negative	NS 83485 55024	Located 162m northwest of the XR034 tower compound, 31m north of the proposed access track, 234m of the visibility splay and 42m of the water crossing.	
XR.GCN.28	0.83	Excellent	Negative	NS 83450 55013	Located 195m northwest of the XR034 tower compound, 64m north of the proposed access	

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
					track, 199m of the visibility splay and 66m of the water crossing.	
XR.GCN.29	N/A	N/A	N/A	NS 82841 54813	Located 241m north of the XR037 tower compound.	Significant dispersal barrier separating the waterbody from the Site. Details in Annex II.
XR.GCN.30	0.58	Below Average	Negative	NS 82829 54647	Located 116m northwest of the XR037 tower compound and 158m northwest of the proposed access track.	
XR.GCN.31	N/A	N/A	N/A	NS 83065 54510	Located 105m southeast of the XR037 tower compound and 85m south of the proposed access track.	Significant dispersal barriers separating the waterbodies from the Site. Details in Annex II.
XR.GCN.32	N/A	N/A	N/A	NS 83016 54514	Located 59m southeast of the XR037 tower compound and 64m south of the proposed access track.	
XR.GCN.33	0.78	Good	Negative	NS 82902 54462	Located 78m southwest of the XR037 tower compound and 115m southwest of the proposed access track.	

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
XR.GCN.34	0.49	Poor	Negative	NS 82143 54722	Located 118m north of the XR039 tower compound, 110m north of the proposed access track and 140m of the pulling area.	
XR.GCN.35	N/A	N/A	N/A	NS 81996 54788	Located 212m north of the proposed access track and 226m of the visibility splay.	Significant dispersal barriers separating the waterbodies from the Site. Details in Annex II.
XR.GCN.36	N/A	N/A	N/A	NS 81581 54629	Located 238m northeast of the XR041 tower compound, 209m west of the proposed access track and 188m of the visibility splays area.	
XR.GCN.37	N/A	N/A	N/A	NS 81636 54407	Located 111m east of the XR041 tower compound, 152m east of the proposed access track and 134m of the visibility splays area.	
XR.GCN.38	0.19	Poor	N/A	NS 80615 53775	Located 10m southeast of the XR044 tower compound, 6m south of the proposed access track and 201m of the visibility splay.	

Waterbody reference	HSI Score	GCN Suitability	eDNA results (Negative / N/A)	Location (OSGR)	Relationship to the Site	Additional Notes
XR.GCN.39	0.18	Poor	N/A	NS 80250 53624	Located 83m north of the XR045 tower compound and 107m north of the proposed access track.	No access available. Pond located within a secured construction area and viewed from distance.
XR.GCN.40	0.64	Average	Negative	NS 80349 53527	Located within the proposed area of the XR045 tower compound, 22m south of the proposed access track and 250m of the visibility splay.	
XR.GCN.41	0.64	Average	Negative	NS 80328 53448	Located 61m south of the XR045 tower compound and around 42m east of the proposed access track.	

Annex II Habitat Suitability Index assessment detailed results

ZG Route Waterbodies

Waterbody ZG.GCN.01

A damp depression with little standing water, bulrush *Typha latifolia* and soft rush *Juncus effusus* are occasionally dominant.

Table A.1. HSI results for waterbody ZG.GCN.01

Suitability Index	Habitat parameter	Field Score	HSI Score
S1	Location	Zone B	0.50
S2	Pond Area	50 m ²	0.10
S3	Pond drying	Dries annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	1	0.38
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	60%	0.90
Score: 0.51 (Below Average)			

Photograph 1. Waterbody ZG.GCN.01



Waterbody ZG.GCN.02

A shallow mosaic of pools containing bulrush, sphagnum moss *Sphagnum sp.*, with localised patches of pondweed *Potamogeton sp.*

Table A.2. HSI results for waterbody ZG.GCN.02

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	50 m ²	0.10
S3	Pond drying	Dries annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	6	0.80
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	70%	1.00
Score: 0.55 (Below Average)			

Photographs 2 & 3. Waterbody ZG.GCN.02



Waterbody ZG.GCN.03

A damp depression containing bulrush, with the occasional duckweeds, lesser spearwort *Ranunculus flammula*, and pondweed sp.

Table A.3. HSI results for waterbody ZG.GCN.03

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	50 m ²	0.10
S3	Pond drying	Dries annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	6	0.80
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	70%	1.00
Score: 0.55 (Below Average)			

Photograph 4 & 5. Waterbody ZG.GCN.03



Waterbody ZG.GCN.04

A collection of bog pools surrounded by hare's-tail cottongrass *Eriophorum vaginatum*, common cottongrass *Eriophorum angustifolium*, water horsetail *Equisetum fluviatile* and scattered immature willows *Salix* sp. Water mostly contains feathery bogmoss *Sphagnum cuspidatum*. Lesser spearwort and sundews *Drosera* sp. are occasionally found in these pools.

Table A.4. HSI results for waterbody ZG.GCN.04

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	50 m ²	0.10
S3	Pond drying	Sometimes dries	0.50
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	6	0.80
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	10%	0.40
			Score: 0.59 (Below Average)

Photograph 6. Waterbody ZG.GCN.04



Waterbody ZG.GCN.05

A consistently shallow SuDS pond adjacent to a substation, with steep heathery sides. The pond is dominated by bulrush, with locally abundant water horsetail. Occasionally pondweed, lesser spearwort, water forget-me-not *Myosotis scorpioides*, marsh cinquefoil *Comarum palustre* are also found.

Table A.5 HSI results for waterbody ZG.GCN.05

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	50 m ²	0.10
S3	Pond drying	Rarely dries	1.00
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S69	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	6	0.80
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	70%	1.00
			Score: 0.7 (Good)

Photograph 7 & 8. Waterbody ZG.GCN.05



Waterbody ZG.GCN.06

A large shallow pond with marginal common cottongrass. Bottle sedge *Carex rostrata*, spike rush *Eleocharis palustris*, and bulrush are locally abundant. Occasionally branched bur-reed *Sparganium erectum*, and water-plantain *Alisma plantago-aquatica* are also found.

Table A.6 HSI results for waterbody ZG.GCN.06

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	50 m ²	0.10
S3	Pond drying	Rarely dries	1.00
S4	Water quality	Good	1.00
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	6	0.80
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	50%	0.80
			Score: 0.71 (Good)

Photograph 9 & 10. Waterbody ZG.GCN.06



Waterbody ZG.GCN.07

A continuous patch of wet ground surrounded by wet woodland and rhododendron *Rhododendron sp.*, consisting of two main patches of standing water connected by overground seepage.

Table A.7 HSI results for waterbody ZG.GCN.07

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	100 m ²	0.20
S3	Pond drying	Dries annually	0.10
S4	Water quality	Poor	0.01
S5	Shade	90%	0.40
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	0	0.01
S9	Terrestrial habitat	Poor	0.33
S10	Macrophyte cover	30%	0.60
			Score: 0.19 (Poor)

Photograph 11 & 12. Waterbody ZG.GCN.07



XX Route Waterbodies

Waterbody XX.GCN.01

Large lake surrounded by dense canary grass *Phalaris* sp, with scattered bottle sedge and rarely present amphibious bistort *Persicaria amphibia* and branched bur-reed within.

Table A.8 HSI results for waterbody XX.GCN.01

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Never dries	0.90
S4	Water quality	Good	1.00
S5	Shade	0-60%	1.00
S6	Waterfowl	Major	0.01
S7	Fish	Major	0.01
S8	Pond count	1	0.38
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	50%	0.80
			Score: 0.29 (Poor)

Photograph 13. Waterbody XX.GCN.01



Waterbody XX.GCN.02

A deep pond which shares water with XX.GCN.03 when the water level is high. Pond is surrounded by bulrush, soft rush and bottle sedge.

Table A.9 HSI results for waterbody XX.GCN.02

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	450 m ²	0.90
S3	Pond drying	Never dries	0.90
S4	Water quality	Poor	0.01
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Absent	1.00
S8	Pond count	1	0.38
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	20%	0.50
			Score: 0.47 (poor)

Photograph 14 & 15. Waterbody XX.GCN.02



Waterbody XX.GCN.03

A large pond, surrounded mostly by bulrush, as well as by with the rest being covered by soft rush and bottle sedge. The water in the pond is turbid with a muddy substrate and is around 1m deep. Pondweed and mare's-tail *Hippuris vulgaris*, with the occasional water-plantain, and rare sweetgrass *Glyceria sp.*, horsetails, marsh-margiold *Caltha palustris* and common spike-rush *Eleocharis palustris* are also present.

Table A.10 HSI results for waterbody XX.GCN.03

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Never dries	0.90
S4	Water quality	Poor	0.01
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Absent	1.00
S8	Pond count	1	0.38
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	20%	0.50
			Score: 0.44 (Poor)

Photograph 16. Waterbody XX.GCN.03



Waterbody XX.GCN.04

A very deep, peaty pond surrounded by willows and birches *Betula* sp., located within a woodland. The pond supports localised patches of pondweed, water-plantain and bottle sedge.

Table A.11 HSI results for waterbody XX.GCN.04

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Never dries	0.90
S4	Water quality	Good	1.00
S5	Shade	80%	0.60
S6	Waterfowl	Minor	0.67
S7	Fish	Possible	0.67
S8	Pond count	6	0.80
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	40%	0.70
			Score: 0.74 (Good)

Photograph 17 & 18. Waterbody XX.GCN.04



Waterbody XX.GCN.05

A large pond within an area of degraded bog with scattered birch trees along its perimeter. The pond is likely quite deep and supports occasional bottle sedge and has locally abundant pondweed and rare bulrush throughout. There are additional two small ponds (XX.GCN.06) to the east that are likely connected to this pond when the water level rises.

Table A.12 HSI results for waterbody XX.GCN.05

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Never dries	0.90
S4	Water quality	Moderate	0.67
S5	Shade	70%	0.80
S6	Waterfowl	Minor	0.67
S7	Fish	Possible	0.67
S8	Pond count	6	0.80
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	10%	0.40
Score			0.69 (Average)

Photograph 19 & 20. Waterbody XX.GCN.05



Waterbody XX.GCN.06

Pond XX.GCN.06 was not subjected to HSI assessment as, at 248m from the closest tower, it was deemed sufficiently distant from the proposed works; furthermore, due to its direct hydrological and terrestrial connectivity with XX.GCN.05, it is assumed that the species status of the latter is representative of both waterbodies.

No photograph available.

Waterbody XX.GCN.07

A shallow and damp area, vegetated with common spike-rush and with scattered bulrush, mare's-tail and lesser spearwort.

Table A.13 HSI results for waterbody XX.GCN.06

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	100 m ²	0.20
S3	Pond drying	Dries annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	6	0.80
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	70%	1.00
Score: 0.59 (Below Average)			

Photograph 21 & 22: Waterbody XX.GCN.07



Waterbody XX.GCN.08

A likely ephemeral pool with a muddy substrate. Marginal vegetation is dominated by sweet-grass and Yorkshire fog *Holcus lanatus*. The pond provides habitat for coots *Fulica atra* and various other waterfowl.

Table A.14 HSI results for waterbody XX.GCN.08

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Dries annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Absent	1.00
S8	Pond count	0	0.01
S9	Terrestrial habitat	Poor	0.33
S10	Macrophyte cover	5%	0.35
			Score: 0.31 (Poor)

Photograph 23. Waterbody XX.GCN.08



Waterbody XX.GCN.09

A shallow depression with an outlet into a much larger water body. The depression is dominated by bottle sedge and rushes, with scattered bulrush, lesser spearwort and occasional patches of pondweed throughout.

Table A.15 HSI results for waterbody XX.GCN.09

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	900 m ²	0.97
S3	Pond drying	Dries annually	0.10
S4	Water quality	Good	1.00
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Absent	1.00
S8	Pond count	6	0.80
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	70%	1.00
			Score: 0.69 (Average)

Photograph 24 & 25. Waterbody XX.GCN.09



Waterbody XX.GCN.10

A shallow depression with an outlet into a much larger water body. The depression is dominated by bottle sedge and rushes, with scattered bulrush, lesser spearwort and occasional patches of pondweed throughout.

Table A.16 HSI results for waterbody XX.GCN.10

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Never dries	0.90
S4	Water quality	Good	1.00
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Minor	0.33
S8	Pond count	6	0.80
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	15%	0.45
			Score: 0.69 (Average)

Photograph 26. Waterbody XX.GCN.10



Waterbody XX.GCN.11

A large loch, surrounded by marginal vegetation that comprises common spike-rush, bottle sedge and bulrush.

Table A.17 HSI results for waterbody XX.GCN.11

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Never dries	0.90
S4	Water quality	Good	1.00
S5	Shade	70%	0.80
S6	Waterfowl	Major	0.01
S7	Fish	Possible	0.67
S8	Pond count	6	0.80
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	10%	0.40
			Score: 0.45 (Poor)

Photograph 27 & 28. Waterbody XX.GCN.11



Waterbody XX.GCN.12

A SuDS pond filled with dense bulrush. No eDNA assessment carried out (See Limitations)

Table A.18 HSI results for waterbody XX.GCN.12

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	500 m ²	1.00
S3	Pond drying	Dries annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Absent	1.00
S8	Pond count	12	0.98
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	70%	1.00
			Score: 0.66 (Average)

No photograph available.

Waterbodies XX.GCN.13 and XX.GCN.14

These waterbodies scoped out of further assessment due to them being significantly isolated from the works area by intensively managed agricultural land, which lacks the necessary connectivity and cover for terrestrial great crested newt dispersal. Also, there are no other suitable ponds within 1km.

No photographs available.

Waterbody XX.GCN.15

A relatively new suds pond, with a muddy substrate, that is shallow throughout. Bulrushes are occasionally dominant along the ponds western edge, while the eastern edge supports scattered bulrush, sweet-grass, great willowherb *Epilobium hirsutum* and soft rush.

Table A.19 HSI results for waterbody XX.GCN.15

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Dries annually	0.10
S4	Water quality	Poor	0.01
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Absent	1.00
S8	Pond count	1	0.38
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	50%	0.80
			Score: 0.34 (Poor)

Photographs 29 & 30 Waterbody XX.GCN.15



Waterbody XX.GCN.16

A new pond formed within the spoil from a nearby construction works that at the time of survey was likely deeper than usual because of the recent rain. Lots of rush *Juncus sp.*, the occasional celery buttercup *Ranunculus sceleratus* and blanketweed *Cladophora sp.*, with rare pondweed throughout. The water contains many dead trees.

Table A.20 HSI results for waterbody XX.GCN.16

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	100 m ²	0.20
S3	Pond drying	Sometimes dries	0.50
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Absent	1.00
S8	Pond count	1	0.38
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	5%	0.35
Score: 0.54 (Below Average)			

Photographs 31 & 32 Waterbody XX.GCN.16



Waterbody XX.GCN.17

Two connected shallow settling ponds with a muddy substrate. An inflow pipe feeds surface run-off to the ponds. The ponds support a variety of marginal vegetation such as bulrush and rushes, but no suitable egg laying vegetation.

Table A.21 HSI results for waterbody XX.GCN.17

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	1500 m ²	0.88
S3	Pond drying	Sometimes dries	0.50
S4	Water quality	Bad	0.33
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Absent	1.00
S8	Pond count	2	0.55
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	0%	0.30
Score: 0.59 (Below Average)			

Photographs 33 & 34. Waterbody XX.GCN.17



Waterbody XX.GCN.18

A large and likely deep pond with clear water which supports a variety of macrophytes along its perimeter such as possibly parrot's-feather *Myriophyllum aquaticum*. Patches of pondweed are present within the pond. Waterfowl droppings and feathers were seen suggesting the pond is used by birds. Additionally, the pond is subject to high levels of fly-tipping.

Table A.22 HSI results for waterbody XX.GCN.18

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Never dries	0.90
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Possible	0.67
S8	Pond count	2	0.55
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	20%	0.50
			Score: 0.66 (Average)

Photographs 35 & 36. Waterbody XX.GCN.18



Waterbody XX.GCN.19

A damp expanse, which is essentially dry, covered in soft rush and bulrush. Occasional pools of standing water that support pondweed.

Table A.23 HSI results for waterbody XX.GCN.19

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	1900 m ²	0.82
S3	Pond drying	Dries annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	2	0.55
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	70%	1.00
Score: 0.63 (Average)			

Photographs 37 & 38. Waterbody XX.GCN.19



Waterbody XX.GCN.20

A wet depression full of water horsetail, with frequent soft rush, occasional bulrush and ragged robin *Silene flos-cuculi* throughout. Occasional pools of standing water that support pondweed.

Table A.24 HSI results for waterbody XX.GCN.20

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Dries annually	0.10
S4	Water quality	Good	1.00
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	2	0.55
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	40%	0.70
			Score: 0.64 (Average)

Photographs 39 & 40. Waterbody XX.GCN.20



Waterbody XX.GCN.21

A shallow wet depression within a wetland habitat, dominated by rushes. This area does not offer any suitable egg-laying habitat for GCN therefore no HSI survey has been carried out for that specific area, however, it was tested with eDNA concurrently with XX.GCN.20.

Photograph 41. Waterbody XX.GCN.21



Waterbodies XX.GCN.22 to XX.GCN.28

Waterbodies scoped out of further assessment due to the presence of a significant dispersal barriers or are isolated from other waterbodies. Waterbody XX.GCN.22 is separated by B8058 Burnhead Road and intensively managed arable field, XX.GCN.23 is separated by the railway line and built-up area, XX.GCN.24 is isolated from the works area by intensively managed agricultural land, XX.GCN.25 is separated by Shotts Burn, XX.GCN.26 and XX.GCN.27 are separated by M8 and built-up areas and XX.GCN.28 is separated by A775 road.

Waterbody XX.GCN.29

An established SuDS pond with a significant depth profile. The aquatic macrophyte community comprises bulrush dominating one half of the waterbody and pondweed covering the remainder. Marginal habitat consists of willow scrub and dense stands of rushes. During the survey, the pond supported moorhen *Gallinula chloropus* and mallard *Anas platyrhynchos*.

Table A.25 HSI results for waterbody XX.GCN.29

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	1400 m ²	0.89
S3	Pond drying	Never dries	0.90
S4	Water quality	Good	1.00
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Absent	1.00
S8	Pond count	0	0.01
S9	Terrestrial habitat	Poor	0.33
S10	Macrophyte cover	70%	1.00
Score: 0.5 (Below Average)			

Photographs 42 & 43. Waterbody XX.GCN.29



Waterbodies XX.GCN.30

A network of connected shallow depressions completely vegetated by a mixture of bulrush, rushes and sedges as well as water-plantain, lesser spearwort and water forget-me-not. Pondweed species are also found within.

Table A.26 HSI results for waterbody XX.GCN.30

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	1100 m ²	0.94
S3	Pond drying	Dries annually	0.10
S4	Water quality	Good	1.00
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	2	0.55
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	70%	1.00
Score: 0.69 (Average)			

Photographs 44 & 45. Waterbody XX.GCN.29



XR Route Waterbodies

Waterbody XR.GCN.01

A pond surrounded by marsh with scattered willows. The pond is deep in the centre and has gently sloping banks in places. Around 60% of the pond is covered by bulrush, with localised patches of sweet-grass, pondweed and water lilies *Nymphaea sp.*, and occasionally water-plantain.

Table A.27 HSI results for waterbody XR.GCN.01

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	450 m ²	0.90
S3	Pond drying	Rarely dries	1.00
S4	Water quality	Good	1.00
S5	Shade	65%	0.90
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	2	0.55
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	70%	1.00
Score: 0.86 (Excellent)			

Photographs 46 & 47. Waterbody XR.GCN.01



Waterbody XR.GCN.02

A large and likely deep pond with extensive marginal vegetation including, bulrush, common spike-rush, clubrush *Schoenoplectus lacustris*, and horsetails. Most of the open water is covered in pondweed. Coots were present at the time of survey.

Table A.28 HSI results for waterbody XR.GCN.02

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Never dries	0.90
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Absent	1.00
S8	Pond count	2	0.55
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	70%	1.00
			Score: 0.78 (Good)

Photographs 48 & 49. Waterbody XR.GCN.02



Waterbody XR.GCN.03

A shallow pond dominated by bulrush, that was dry at the time of survey hence no eDNA sampling has been carried out.

Table A.29 HSI results for waterbody XR.GCN.03

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	900 m ²	0.97
S3	Pond drying	Dries annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	85%	0.50
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	9	0.91
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	70%	1.00
			Score: 0.66 (Average)

Photograph 50. Waterbody XR.GCN.03



Waterbody XR.GCN.04

A pond with a muddy substrate, surrounded by common spike-rush, bulrush, bottle sedge and lesser spearwort.

Table A.30 HSI results for waterbody XR.GCN.04

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	300 m ²	0.60
S3	Pond drying	Dries annually	0.10
S4	Water quality	Good	1.00
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	9	0.91
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	0%	0.30
			Score: 0.62 (Average)

Photographs 51 & 52. Waterbody XR.GCN.04



Waterbody XR.GCN.05

Two very close ponds, one of which is densely vegetated by bulrush and the other is covered in common spike-rush. Both have likely recently dried, as each pond contains water-plantain and pondweed.

Table A.31 HSI results for waterbody XR.GCN.05

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	150 m ²	0.30
S3	Pond drying	Dries annually	0.10
S4	Water quality	Good	1.00
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	13+	1.00
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	65%	0.95
			Score: 0.65 (Average)

Photographs 53 & 54. Waterbody XR.GCN.05



Waterbody XR.GCN.06

A quarry pond characterized by highly turbid water and fluctuating levels, as evidenced by the dry, unvegetated upper banks. Aquatic vegetation includes locally abundant water-plantain and pondweed. Marginal areas support occasional spike-rush and locally abundant water horsetail though the surrounding banks remain largely sparse.

Table A.32 HSI results for waterbody XR.GCN.06

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	500 m ²	1.00
S3	Pond drying	Dries annually	0.10
S4	Water quality	Poor	0.01
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	13+	1.00
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	20%	0.50
			Score: 0.42 (Poor)

Photographs 55 & 56. Waterbody XR.GCN.05



Waterbody XR.GCN.07

A quarry pond displaying evidence of significant desiccation, with receding water levels and a perimeter of cracked mud. The water column is highly turbid and supports limited botanical diversity, though water-plantain is locally abundant. Despite signs of nutrient enrichment or pollution, the pond continues to support a modest assemblage of aquatic invertebrates.

Table A.33 HSI results for waterbody XR.GCN.07

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Dries annually	0.10
S4	Water quality	Poor	0.01
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	9	0.91
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	20%	0.50
Score			0.39 (Poor)

Photographs 57 & 58. Waterbody XR.GCN.05



Waterbodies XR.GCN.08, XR.GCN.09 and XR.GCN.10

Waterbodies scoped out of further assessment due to the presence of a quarry which is a significant dispersal barrier.

Photograph 59. XR.GCN.10 and XR.GCN.08



Waterbody XR.GCN.11

A large pond and likely deep pond with marginal scattered willows, soft rush and mosses. The pond supports locally abundant bulrush. There is also rarely distributed bur-reed, lesser spearwort, bedstraws *Galium sp.*, wild angelica *Angelica sylvestris* and duckweed.

Table A.34 HSI results for waterbody XR.GCN.11

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Never dries	0.90
S4	Water quality	Good	1.00
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Possible	0.67
S8	Pond count	9	0.91
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	30%	0.60
			Score: 0.82 (Excellent)

Photographs 60 & 61. Waterbody XR.GCN.05



Waterbody XR.GCN.12

A shallow pond that was likely dry before recent rains. The pond is overgrown with bulrush, common spike-rush, common cottongrass, and duckweed.

Table A.35 HSI results for waterbody XR.GCN.13

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	200 m ²	0.40
S3	Pond drying	Dries annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	0-60	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	9	0.91
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	70	1.00
			Score: 0.64 (Average)

Photograph 62. Waterbody XR.GCN.12



Waterbody XR.GCN.13

A shallow pond, with scattered willows along its margin. The pond has small patches of open water, dominated by bulrush and has occasional yellow iris *Iris pseudacorus*.

Table A.36 HSI results for waterbody XR.GCN.13

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	1600 m ²	0.86
S3	Pond drying	Dries annually	0.10
S4	Water quality	Poor	0.01
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	9	0.91
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	70%	1.00
			Score: 0.46 (Poor)

Photographs 63 & 64. Waterbody XR.GCN.13



Waterbody XR.GCN.14

A possibly artificial, but well-established pond that is very deep. The margins of the pond support mosses and bur-reed. The pond contains locally abundant bulrush and occasional pondweed. A flock of geese *Anser sp.* was recorded utilizing the waterbody at the time of the survey.

Table A.37 HSI results for waterbody XR.GCN.13

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
	Pond area	850 m ²	0.98
S3	Pond drying	Never dries	0.90
S4	Water quality	Good	1.00
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Possible	0.67
S8	Pond count	9	0.91
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	70%	1.00
			Score: 0.84 (Excellent)

Photographs 65 & 66. Waterbody XR.GCN.13



Waterbody XR.GCN.15

A possibly artificial, but well-established pond that is very deep. The margins of the pond support mosses and bur-reed. The pond contains locally abundant bulrush.

Table A.38 HSI results for waterbody XR.GCN.15

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	1400 m ²	0.89
S3	Pond drying	Never dries	0.90
S4	Water quality	Good	1.00
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Possible	0.67
S8	Pond count	9	0.91
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	40%	0.70
			Score: 0.81 (Excellent)

Photograph 67. Waterbody XR.GCN.15



Waterbody XR.GCN.16

Large pond with surface filamentous algae and locally abundant duckweed. The margins are well-vegetated, supporting bulrush, canary-reed, bur-reed and marsh cinquefoil.

Table A.39 HSI results for waterbody XR.GCN.16

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	500 m ²	1.00
S3	Pond drying	Never dries	0.90
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Possible	0.67
S8	Pond count	9	0.91
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	10%	0.40
			Score: 0.77 (Good)

Photographs 68 & 69. Waterbody XR.GCN.16



Waterbodies XR.GCN.17 and XR.GCN.18

Waterbodies scoped out of further assessment due to the presence of a significant dispersal barriers. Both waterbodies are separated by Tillan Burn and Carlisle Road.

Waterbody XR.GCN.19

A linear waterbody situated within a grazing pasture. The water is highly turbid with a muddy substrate, likely due to livestock poaching. Despite this, the pond supports a diverse marginal vegetation including bulrush, bur-reed and sweet-grass. Additional species recorded include bedstraw, water forget-me-not, soft rush and lesser spearwort.

Table A.40 HSI results for waterbody XR.GCN.19

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	1000 m ²	0.95
S3	Pond drying	Rarely dries	1.00
S4	Water quality	Poor	0.01
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Possible	0.67
S8	Pond count	1	0.38
S9	Terrestrial habitat	Poor	0.33
S10	Macrophyte cover	65%	0.95
			Score: 0.44 (Poor)

Photographs 70 & 71. Waterbody XR.GCN.19



Waterbody XR.GCN.20

A shallow, likely ephemeral pond with an average depth of 20cm. Due to its propensity for seasonal drying, it was not identified during the initial desk-based assessment. The pond is surrounded by abundantly distributed water forget-me-not. Other species present include occasional lesser spearwort, bur-reed, sweet-grass, soft rush and spike-rush.

Table A.41 HSI results for waterbody XR.GCN.20

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	150 m ²	0.30
S3	Pond drying	Dries annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	2	0.55
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	60%	0.90
Score: 0.57 (Below Average)			

Photograph 72. Waterbody XR.GCN.20



Waterbody XR.GCN.21

Waterbody scoped out of further assessment due to it being isolated by intensively managed agricultural land creating inhospitable environment with lack of connectivity to other water bodies. The nearest waterbodies are around 0.7km away.

Waterbody XR.GCN.22

A shallow, likely ephemeral waterbody with an average depth of 20cm. The pond supports a varied floral community, with water forget-me-not recorded as abundant. Other species present include occasional lesser spearwort, bur-reed, sweet-grass, soft rush and spike-rush.

Table A.42 HSI results for waterbody XR.GCN.22

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	150 m ²	0.30
S3	Pond drying	Dries annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	1	0.38
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	60%	0.90
Score: 0.54 (Below Average)			

Photograph 73. Waterbody XR.GCN.22



Waterbody XR.GCN.23

Waterbody scoped out of further assessment due to the presence of a significant dispersal barriers both to the north and south, comprising of North Calder Water and Allanton Road.

Waterbody XR.GCN.24

A small pond within a depression in a field. The pond is surrounded by approximately 2m strip of sweetgrass, which form floating matts with locally abundant soft rush. The pond appears shallow with a muddy substrate and supports abundant duckweed.

Table A.43 HSI results for waterbody XR.GCN.24

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	300 m ²	0.60
S3	Pond drying	Rarely dries	1.00
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Absent	1.00
S8	Pond count	0	0.01
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	20%	0.50
			Score: 0.46 (Poor)

Photograph 74. Waterbody XR.GCN.24



Waterbody XR.GCN.25

Waterbody scoped out of further assessment due to the presence of a significant dispersal barrier. The pond is isolated from the works area by intensively managed agricultural land, which lacks the necessary connectivity and cover for terrestrial great crested newt dispersal.

Waterbody XR.GCN.26

A large pond within an area of marshy grassland, which likely has a deep central profile. The pond is surrounded by approximately 3m strip of inundated bulrush. The aquatic macrophyte community is dominated by pondweed and has rare water-plantain within. Ducks were observed at the time of survey.

Table A.44 HSI results for waterbody XR.GCN.26

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Never dries	0.90
S4	Water quality	Moderate	0.67
S5	Shade	0-60	1.00
S6	Waterfowl	Minor	0.67
S7	Fish	Possible	0.67
S8	Pond count	2	0.55
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	65	0.95
			Score: 0.75 (Good)

Photographs 75 & 76. Waterbody XR.GCN.26



Waterbody XR.GCN.27

A relatively shallow pond with dense and inundated bulrush, and occasional duckweed throughout. No substantial standing water which supports a variety of vegetation.

Table A.45 HSI results for waterbody XR.GCN.27

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	500 m ²	1.00
S3	Pond drying	Dries annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	2	0.55
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	70%	1.00
			Score: 0.67 (Average)

Photograph 77. Waterbody XR.GCN.27



Waterbody XR.GCN.28

A relatively deep pond surrounded by approximately 2m wide strip of dense bulrush and with localised patches of lesser spearwort and great willowherb. The surface of the pond is covered in pondweed.

Table A.46 HSI results for waterbody XR.GCN.28

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	500 m ²	1.00
S3	Pond drying	Never dries	0.90
S4	Water quality	Good	1.00
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Possible	0.67
S8	Pond count	2	0.55
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	70%	1.00
			Score: 0.83 (Excellent)

Photograph 78. Waterbody XR.GCN.28



Waterbody XR.GCN.29

Waterbody scoped out of further assessment due to it being separated by M8 motorway from the Site, which is a significant dispersal barrier.

Waterbody XR.GCN.30

A shallow and elongated pond surrounded within a grassland. The pond exhibits characteristics of area that floods and dries annually. Pond is covered in dense patches of rushes. Other vegetation includes creeping buttercup and bulrush.

Table A.47 HSI results for waterbody XR.GCN.30

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	400 m ²	0.80
S3	Pond drying	Dries annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	4	0.70
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	5%	0.35
Score: 0.58 (Below Average)			

Photographs 79 & 80. Waterbody XR.GCN.30



Waterbodies XR.GCN.31 and XR.GCN.32

Waterbodies scoped out of further assessment due to is being separated from the works by the railway line which acts as a sufficient barrier.

Waterbody XR.GCN.33

A waterbody situated within an area of dense scrub, characterized by an organic odour and highly unstable (soft) banks. The banks vegetation community is dominated by horsetail, mare's-tail and bur-reed. The water surface is entirely obscured by a dense cover of duckweed.

Table A.48 HSI results for waterbody XR.GCN.33

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	> 2000 m ²	Exclude
S3	Pond drying	Never dries	0.90
S4	Water quality	Good	1.00
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Possible	0.67
S8	Pond count	4	0.70
S9	Terrestrial habitat	Good	1.00
S10	Macrophyte cover	20%	0.50
			Score: 0.78 (Good)

Photograph 81. Waterbody XR.GCN.33



Waterbody XR.GCN.34

A stagnant linear drainage waterbody, characterized by very shallow water levels and gently sloping, muddy banks. The substrate is predominantly silty, supporting sparse amounts of pondweed. The marginal vegetation is dominated by rushes, buttercup and horsetail species.

Table A.49 HSI results for waterbody XR.GCN.34

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	450 m ²	0.90
S3	Pond drying	Sometimes dries	0.50
S4	Water quality	Moderate	0.67
S5	Shade	0-60	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	0	0.01
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	45	0.75
			Score: 0.49 (Poor)

Photograph 82. Waterbody XR.GCN.34



Waterbodies XR.GCN.35, XR.GCN.36 and XR.GCN.37

Waterbodies scoped out of further assessment due to the presence of significant dispersal barriers. XR.GCN.35 is isolated from the works via a steep quarry cliff, XR.GCN.36 via the railway line and XR.GCN.37 via the main A71 road.

Waterbody XR.GCN.38

An ephemeral flooded area within a cattle field, characterized by shallow (~3cm), slow-flowing water and high levels of turbidity. The substrate is heavily poached and disturbed by livestock. The surrounding habitat consists of unmanaged, overgrown grassland dominated by rushes.

Table A.50 HSI results for waterbody XR.GCN.38

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	<50 m ²	0.05
S3	Pond drying	Dries annually	0.10
S4	Water quality	Poor	0.01
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	0	0.01
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	0%	0.30
			Score: 0.19 (Poor)

Photographs 83 & 84. Waterbody XR.GCN.38



Waterbody XR.GCN.39

A SuDS pond located within a secured construction area. The waterbody has high levels of turbidity and physical disturbance consistent with active site works. The banks are comprised of bare ground and lack any marginal vegetation.

Table A.51 HSI results for waterbody XR.GCN.39

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	<50 m ²	0.05
S3	Pond drying	Dries annually	0.10
S4	Water quality	Poor	0.01
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	2	0.55
S9	Terrestrial habitat	None	0.01
S10	Macrophyte cover	0%	0.30
			Score: 0.18 (Poor)

Photograph 85. Waterbody XR.GCN.39



Waterbody XR.GCN.40

A pond that is overgrown with bulrush. Other marginal vegetation includes meadowsweet *Filipendula ulmaria*, marsh-bedstraw *Galium palustre*, common nettle *Urtica dioica* and forget-me-not species.

Table A.52 HSI results for waterbody XR.GCN.40

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	850	0.98
S3	Pond drying	Dries Annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	2	0.55
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	70%	1.00
Score: 0.64 (Average)			

Photographs 86 & 87. Waterbody XR.GCN.40



Waterbody XR.GCN.41

An area of inundation resulting from overflow from an adjacent drainage ditch. The area is shallow and has a muddy substrate. The vegetation is dominated by reed canary-grass and has a marginal assemblage consisting of meadowsweet and creeping thistle *Cirsium arvense*.

Table A.53 HSI results for waterbody XR.GCN.41

Suitability index	Habitat parameter	Field Score	HSI score
S1	Location	Zone B	0.50
S2	Pond area	850 m ²	0.98
S3	Pond drying	Dries annually	0.10
S4	Water quality	Moderate	0.67
S5	Shade	0-60%	1.00
S6	Waterfowl	Absent	1.00
S7	Fish	Absent	1.00
S8	Pond count	2	0.55
S9	Terrestrial habitat	Moderate	0.67
S10	Macrophyte cover	70%	1.00
			Score: 0.64 (Average)

Photographs 88 & 89. Waterbody XR.GCN.41



Annex III Initial and relabelled waterbody references

Details of the initial desk-based referencing of the waterbodies and the finalised referencing is provided in Table A.53 below. These references are needed to refer to while checking the SureScreen Laboratory results in Annex III.

Table A.55 Waterbody references

Initial Waterbody Reference	Updated Waterbody Reference	Laboratory ID
ZG Route		
DN01	ZG.GCN.01	Laboratory ID: GCN25 6260
DN02	ZG.GCN.02	Laboratory ID: GCN25 6259
DN03	ZG.GCN.03	Laboratory ID: GCN25-7304
DN04	ZG.GCN.04	Laboratory ID: GCN25 7301
DN06	ZG.GCN.05	Laboratory ID: GCN25-7302
DN07	ZG.GCN.06	Laboratory ID: GCN25-7298
ZG01	ZG.GCN.07	Laboratory ID: GCN25 6253'
XX Route		
XX01	XX.GCN.01	Pond unsuitable for GCN.
XX02a	XX.GCN.02	Tested with XX.GCN.03. Laboratory ID: GCN25-9691
XX02b	XX.GCN.03	Tested with XX.GCN.04. Laboratory ID: GCN25-9691
XX04	XX.GCN.04	Laboratory ID: GCN25-7293
XX05	XX.GCN.05	Laboratory ID: GCN25-7313
XX06	XX.GCN.06	Not surveyed
XXB	XX.GCN.07	Laboratory ID: GCN25-7317

XXE	XX.GCN.08	Laboratory ID: GCN25-7311
XXC	XX.GCN.09	Laboratory ID: GCN25-7305
XX07	XX.GCN.11	Laboratory ID: GCN25-7315
XX09	XX.GCN.10	Laboratory ID: GCN25-7299
XXD	XX.GCN.12	Pond found during fieldwork. See Limitations.
XX13	XX.GCN.13	N/A
XX14	XX.GCN.14	N/A
XX18	XX.GCN.15	Laboratory ID: GCN25-7291
XXA	XX.GCN.16	Laboratory ID: GCN25-7300
XX19	XX.GCN.17	Laboratory ID: GCN25-9693
XX21	XX.GCN.18	Laboratory ID: GCN25-7296
XX22	XX.GCN.19	Laboratory ID: GCN25-7297
XX24	XX.GCN.20	Laboratory ID: GCN25-7292
XX25	XX.GCN.21	Laboratory ID: GCN25-7292
XX26	XX.GCN.22	N/A
XX27	XX.GCN.23	N/A
XX28	XX.GCN.24	N/A
XX29	XX.GCN.25	N/A
XX30	XX.GCN.26	N/A
XX31	XX.GCN.27	N/A
XX32	XX.GCN.28	N/A
XX33	XX.GCN.29	N/A
XX34	XX.GCN.30	Laboratory ID: GCN25-7295
XX35	XX.GCN.31	Laboratory ID: GCN25-7303

XR Route		
XR01	XR.GCN.01	Laboratory ID: GCN25-7294
XR02	XR.GCN.02	Laboratory ID: GCN25-7290
XR05	XR.GCN.03	Dry at the time of survey.
XR0B	XR.GCN.04	Laboratory ID: GCN25-7316
XRA	XR.GCN.05	Laboratory ID: GCN25-0698
XR06	XR.GCN.06	Laboratory ID: GCN25-7306
XR07	XR.GCN.07	Laboratory ID: GCN25-7310
XR08	XR.GCN.08	N/A
XR09	XR.GCN.09	N/A
XR10	XR.GCN.10	N/A
XR11	XR.GCN.11	Laboratory ID: GCN25-7309
XRC	XR.GCN.12	Laboratory ID: GCN25-7318
XR12	XR.GCN.13	Laboratory ID: GCN25-7314
XR13	XR.GCN.14	Laboratory ID: GCN25-7312
XR14	XR.GCN.15	Laboratory ID: GCN25-7308
XR15	XR.GCN.16	Laboratory ID: GCN25-7307
XR17	XR.GCN.17	N/A
XR18	XR.GCN.18	Laboratory ID: GCN25-7291
XR19	XR.GCN.19	Laboratory ID: GCN25-9706
None	XR.GCN.20	Pond found during fieldwork. See Limitations.
XR20	XR.GCN.21	N/A

None	XR.GCN.22	Pond found during fieldwork. See Limitations.
XR23	XR.GCN.23	N/A
XR24	XR.GCN.24	Laboratory ID: GCN25-9702
XR25	XR.GCN.25	Laboratory ID: GCN25-7292
XR28	XR.GCN.26	Laboratory ID: GCN25-9701
XR29	XR.GCN.27	Laboratory ID: GCN25-9697
XR30	XR.GCN.28	Laboratory ID: GCN25-9703
XR32	XR.GCN.29	N/A
XR33	XR.GCN.30	Laboratory ID: GCN25-9711
XR34	XR.GCN.31	N/A
XR35	XR.GCN.32	N/A
XR36	XR.GCN.33	Laboratory ID: GCN25-9709
XR38	XR.GCN.34	Laboratory ID: GCN25-9710
XR39	XR.GCN.35	N/A
XR40	XR.GCN.36	N/A
XR41	XR.GCN.37	N/A
XR42	XR.GCN.38	Pond unsuitable for GCN. See Limitations.
XRD	XR.GCN.39	Pond within a fenced construction area. See Limitations.
XR43	XR.GCN.40	N/A
XR44	XR.GCN.41	Laboratory ID: GCN25-9716

Annex IV SureScreen laboratory certificates