

Rush Wall Solar Park

Environmental Statement

Appendix 2.3

Landscape and ecology management plan (LEMP)

# Landscape and Ecology Management Plan Rush Wall Solar Park

November 2025

Report no: LEMP-526.5

A report by

Western Ecology, 1 Geffery Close, Landrake, Saltash, Cornwall PL12 5HA Telephone: 0800 622 6828 email: office@westernecology.co.uk

## Report details

Site name: Rush Wall Solar Park  
 Site address: Redwick, Newport  
 Grid reference: ST 416 853  
 Report date: 15<sup>th</sup> November 2025  
 Report author: Colin Hicks BSc (Hons) MCIEEM  
 Checked by: Yolande Knight PhD, MRSB

## Declaration of compliance

### BS 42020:2013

This study has been undertaken in accordance with British Standard 42020:2013 Biodiversity, Code of practice for planning and development.

### Code of Professional Conduct

The information which we have prepared is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

## Revisions

Date	Report no:	Comment
22/06/2020	LEMP-526.1	Final report
16/11/2021	LEMP-526.2	Taking into account consultee comments
05/02/2022	LEMP-526.2	Taking into account consultee comments at 2 <sup>nd</sup> pre-app
30/05/2025	LEMP-526.3	Updated report
15/11/2025	LEMP-526.5	Taking into account consultee comments

Table of contents

1. Introduction .....	5
1.1. Background .....	5
1.2. Embedded mitigation .....	5
2. Existing features of ecological value .....	6
2.1. Statutory nature conservation sites .....	6 2.2.
Habitats .....	6 2.3.
Species .....	7
Map 1. Phase 1 habitats .....	9
3. Ecological and Landscape mitigation strategy .....	10
3.1. Introduction .....	10 3.2.
Pre-construction phase .....	10 3.3. Pre-
Construction phase .....	11
3.4. Decommissioning phase .....	17
4. Management plan .....	19
4.1. Aim and objective .....	19 4.2.
Reens .....	19 4.3.
Ditches .....	19 4.4.
Hedgerows .....	20 4.5.
Grassland buffers adjacent to reens, ditches and hedgerows .....	22 4.6.
Grassland beneath solar panels .....	23
4.7. Bat and breeding bird boxes .....	24
5. Monitoring .....	25
5.1. Introduction .....	25 5.2.
Invertebrate and aquatic flora monitoring .....	25 5.3.
Habitats .....	26 5.4.
Ornithology .....	27 5.5.
Other fauna .....	27
6. Decommissioning .....	29
Map 2. Landscape Ecology Management Plan .....	30
Appendix 1 - semi-aquatic mammals associated with reens.....	31
Mitigation for Otter .....	31
Mitigation for Water Vole .....	31
Appendix 2 - Breeding Lapwing mitigation .....	33
Appendix 3 - Over wintering Lapwing mitigation .....	35
Map 3. Lapwing mitigation areas .....	36
Appendix 4 - Great Crested Newt mitigation .....	37
Map 4. Great Crested Newt mitigation plan .....	39
Appendix 5 - Ground nesting bird strategy during the construction phase .....	40
Appendix 6 Ditch management plan .....	41 Map 5.
Ditches within Field blocks 4 and 5 .....	44
Map 6. Ditch management plan .....	50
Appendix 7 - Assessment of net gain. ....	51 Defra
Biodiversity Metric 3.0 .....	51
SPIES tool .....	53

Appendix 8 Soil sampling results. ....	57
Map 7. Soil sampling phosphorous levels .....	57

## 1. Introduction

### 1.1. Background

This Landscape and Ecology Management Plan (LEMP) has been produced to accompany a planning application for a solar energy generation proposal on land near the village of Redwick, south east of Newport, Wales on the Gwent Levels.

The proposed solar park would export renewable energy to the local electricity network. The LEMP provides details of mitigation and enhancement requirements during the construction and operational phases, and a management framework during the operational phase.

It covers the period of the lifetime of the project, although this would be reviewed every five years, after which management would be reviewed against the current site conditions.

### 1.2. Embedded mitigation

It is recognised that physical changes as a result of a solar park development in this location, such as changes in views or ground disturbance, would result from the proposal. These changes are referred to as impacts. The design and layout of the solar park has responded to the location's value and sensitivities in order to reduce the magnitude of such impacts through primary (embedded) mitigation, as detailed within 'Responding to the Environmental Sensitivity of the Site', in paragraphs 2.41 and 2.42 of Chapter 2.

## 2. Existing features of ecological value

### 2.1. Statutory nature conservation sites

#### National designated sites

There are 10 sites of Special Scientific Interest (SSSI) within the Zone of Influence (5km) of the proposed development.

The Severn Estuary SSSI is located 1.2km to the south and been designated amongst other things for its wintering and passage wading birds including Curlew and Redshank populations, and most of its nationally important Ringed Plover and Grey Plover populations. Other waders which occur in significant numbers within the SSSI are Common Snipe, Knot, Whimbrel and Turnstone.

The proposed development is located within Gwent Levels Redwick and Llandeenny SSSI. The Gwent Levels constitute the lowlands between Cardiff and Chepstow and are drained by an ordered network of drainage ditches. They are an example of one of the most extensive areas of reclaimed wet pasture in Great Britain. The Redwick and Llandeenny area supports rich assemblages of invertebrate species and a number of nationally rare plant species

Significant effect has been discounted within the Environmental Statement for all of these sites.

#### Internationally designated sites

Severn Estuary SPA and RAMSAR are located 1.2km to the south.

The SPA has been designated for its wintering and passage birds, which includes an assemblage during winter that includes Gadwall, Shelduck, Pintail, Dunlin, Curlew, Redshank, Bewick's Swan, Wigeon, Lapwing, Teal, Mallard, Shoveler, Pochard, Tufted Duck, Grey Plover, White-fronted Goose, Whimbrel.

The RAMSAR has been designated for migratory fish and migratory birds in spring and autumn, which include Common Ringed Plover, Dunlin, Whimbrel, and Common Redshank. The site also regularly supports more than 20,000 waterfowl.

Significant effect has been discounted for these Internationally designated sites.

## 2.2. Habitats

The footprint of the proposed solar park comprises 23ha of improved grassland and 59ha arable managed to provide fodder and forage for a dairy herd on a two to three year rotation (Map 1). This land is enclosed by 8.94km of species rich hedgerows associated with 1.18ha of ditches, and the site is crossed by 0.26ha of reens.

Occasional tall ruderals (0.36ha) are present along grassland and reen margins.

The site as a whole comprises an area of coastal and floodplain grazing marsh, a habitat listed under Section 7 of the Environment (Wales) Act 2016 and are a Local Biodiversity Action Plan priority habitat. Ditches are part of the area of coastal and floodplain grazing marsh. This habitat is also part of a network of ditches that are an interest feature of the Gwent Levels Redwick and Llandeenny SSSI. Accordingly, this habitat is of National value for biodiversity. The majority of these ditches were overgrown with native shrub hedgerows and were generally dry.

Reens are part of the area of coastal and floodplain grazing marsh habitat and part of a network of reens that are an interest feature of the Gwent Levels Redwick and Llandeenny SSSI. Accordingly, this habitat is of National value for biodiversity.

Hedgerows are listed under Section 7 of the Environment (Wales) Act 2016 and are a Local Biodiversity Action Plan priority habitat. The hedgerows would not qualify as ecologically important for the purposes of the Hedgerow Regulations 1997 due a lack of species diversity.

## 2.3. Species

Species listed here are those that are confirmed, or judged likely, to be present within the proposed development and its boundaries.

**Amphibians** eDNA surveys have detected Great Crested Newt in the east of the site, whilst common amphibians are likely to be present elsewhere.

### Badger

Evidence of occasional Badgers foraging has been identified across the site, although wellworn pathways are not present and no setts have been found.

### Bats

Hedgerows provide good foraging habitat for a range of widespread bat species, whilst occasional larger trees just outside the development footprint have low potential for roosting bats.

During remote bat monitoring and bat activity transects in 2024/25, eight species and two species groups of bats were recorded here, largely comprising Common Pipistrelle, Soprano Pipistrelle and Noctule, both commonly associated with intensively managed farmland.

### Birds

Boundary habitats (hedgerows and ree margins) associated with the Solar Park will support widespread and common nesting bird species.

Breeding bird surveys were completed in spring/summer 2019 and 2024, with passage/winter bird surveys in the periods 2018/2019, 2019/2020 and 2024/2025.

A total of 50 bird species were recorded during breeding bird surveys, including at least 4 pairs of Lapwing. However, no active nests or chicks were recorded, while there was a noticeable lack of typical breeding behaviour (such as agitation, courtship or mobbing). Based on this, it is considered unlikely that lapwing are currently successfully breeding within the Proposed Development Site.

A fairly diverse range of birds did successfully breed within the site and its surrounds, including a number of species of Conservation Concern. These are all associated with the hedges, reens and the very limited areas of adjacent scrubby cover.

The fields themselves offer very limited nesting opportunities. Skylark were the only species trying to nest here, but silage cutting probably rendered all attempts unsuccessful and no juvenile Skylark were recorded.

Of the wintering birds, Pochard, Bewick's Swan, Teal, Curlew and Wigeon were recorded here in small numbers on a single visit. Lapwing, Snipe, Mallard were most commonly recorded, with occasional Lesser Black-backed Gull and Shelduck.

### Invertebrates

Aquatic invertebrate and Shril Carder Bee surveys were completed in 2019 and 2025. No Shril Carder Bees were recorded, whilst aquatic invertebrate communities were judged to be of Low importance for rare or scarce invertebrates.

### Otter

Occasional Otter spraint was recorded associated with the reens, and the records search strongly suggests they are present in the general area. However, the site has no evidence of holts or couches and it is extremely unlikely that Otter are resting here.

### Water Vole

Although the majority of the site lacked recent evidence of Water Vole, a limited area within the centre of the site exhibited a high concentration of field signs indicating recent activity in 2019. By 2025, these signs were no longer present and water vole are thought to be currently absent.

Water Vole are known to be in the local area, and as the reens are generally well connected across the Site, it is reasonable to conclude that Water Vole are present across the wider site.

### Flora

No plants of restricted distribution were recorded here.







### Reptiles

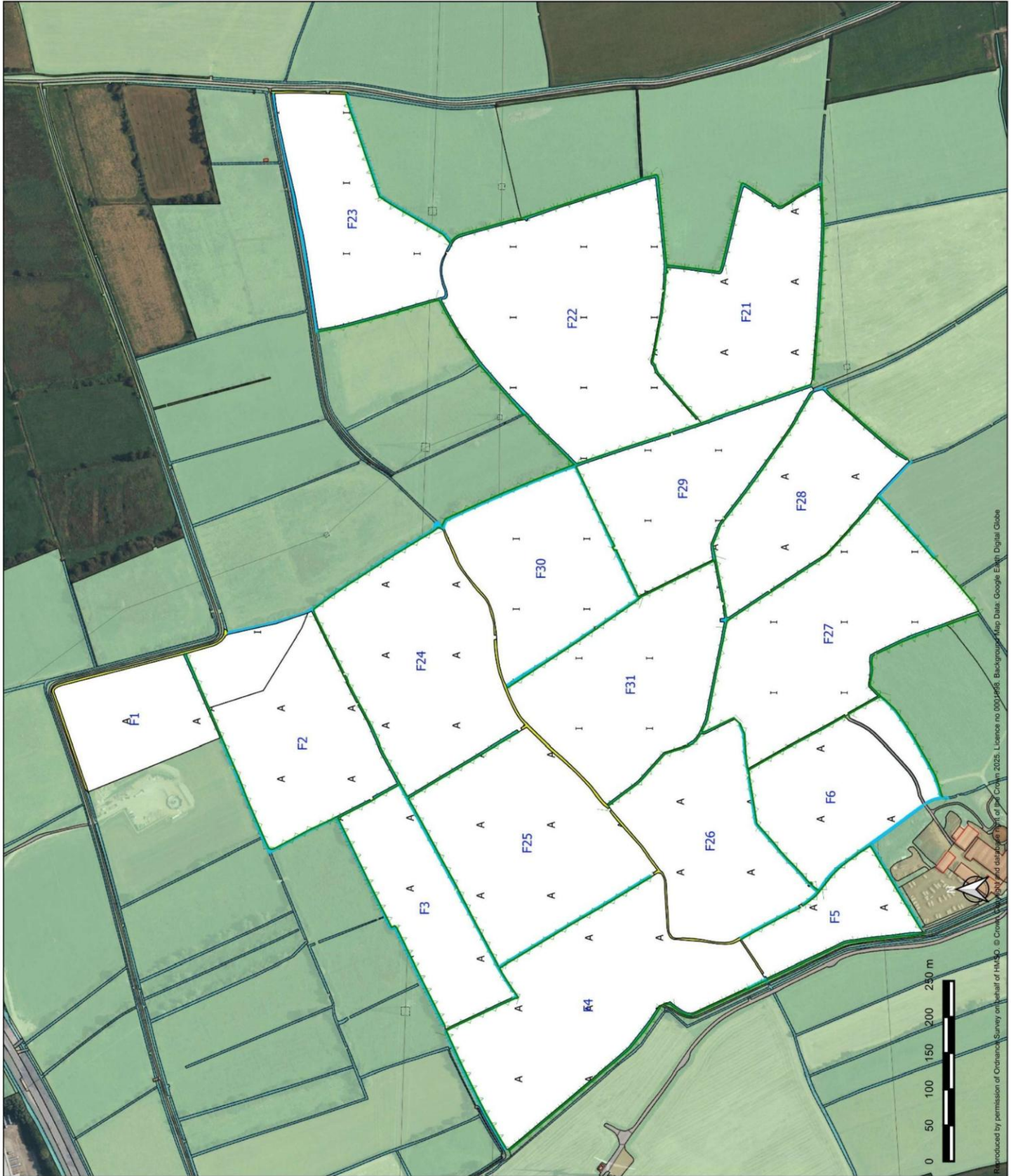
Grass Snake are present within the site.

### Fish

European Eel will be present within the reens and larger ditches.

**Legend**

-  Arable
-  Ditch
-  Reen
-  Improved grassland
-  Intact hedge with trees, native species rich
-  Intact hedge, native species rich



Title: Map 1 Phase 1 habitats

Project: Rush Wall Solar Park

Checked by: CDH Version: 034  
Date: 19.6.25

## 3. Ecological and Landscape mitigation strategy

### 3.1. Introduction

This LEMP should be read in conjunction with the Environmental Statement (ES).

The strategy within this report will focus on existing features of nature conservation value (valued receptors) associated with the site, describing how the value of these features will be retained/protected during the proposed development, and then providing details on longterm management during the operational phase. Recommendations are also made to minimise biodiversity loss during future decommissioning.

Where it has been judged within the ES that there is potential that the proposed development will have a significant effect on a valued ecological feature of nature conservation interest, recommendations for mitigation are made based on the mitigation hierarchy;

- Avoidance significant harm to wildlife species and habitats should be avoided through design.
- Mitigation where significant harm cannot be wholly or partially avoided, it should be minimised by design, or by the use of effective mitigation measures that can be secured by, for example, conditions or planning obligations.
- Compensation where, despite whatever mitigation would be effective, there would still be significant residual harm, as a last resort, this should be properly compensated for by measures to provide for an equivalent value of biodiversity.

To align with local and national planning policy, Appendix 5 of this report will provide detail of biodiversity net gain illustrated through the Defra Biodiversity Metric 3.0 and will assess proposed management through the Solar Park Impact on Ecosystem Services (SPIES) tool.

### 3.2. Pre-construction phase

#### Aims and objectives

The aim of this plan is to detail the ecological and landscape mitigation and enhancement that will be adopted during the pre-construction phase that reflects the conclusion of the surveys and impact assessment completed for this development. This mitigation will be adopted to avoid adverse impacts on:

- amphibians, Badger, Water Vole, Otter, Eel, reptiles, breeding birds, invertebrates and aquatic plants associated with reens and ditches.
- breeding and wintering birds associated with farmland habitats;
- qualifying features of statutory nature conservation sites present with the Zone of Influence; habitats listed under Section 7 of the Environment (Wales) Act 2016

Avoidance/mitigation	Comments
<p>A Construction Environmental Management Plan (CEMP) will be produced. This will provide details of site compounds, storage and access, working methodologies, control of dust, noise and pollutants, timing of operations, public footpaths, site security, and pre- and construction phase ecological mitigation.</p> <p>Prior to the start of construction, and Ecological Clerk of Works (ECOW) will be appointed to oversee the construction phase. The ECOW will:</p> <ul style="list-style-type: none"> <li>• Advise on protecting valued biodiversity features;</li> <li>• Provide practical, site-specific and proportionate assistance on compliance with environmental legislation.</li> <li>• Manage ecological operatives engaged in ecological mitigation activities – such as undertaking ecological watching briefs and translocation of protected species.</li> </ul>	<p>Responsible team: Client and subject specialists</p> <p>Responsible team: Client</p> <p>The ECOW needs to be a suitably qualified and licenced ecologist with at a minimum of 1 year's experience of ECOW activities. Responsibilities will include, but not be limited to:</p> <ul style="list-style-type: none"> <li>• Attend pre-construction site walkover with construction team</li> <li>• Provide toolbox talks during site inductions.</li> <li>• Check any suitable habitat for nesting birds if it will be impacted in the accepted bird nesting season (March to August inclusive). This includes scrub, hedgerows and any areas of managed grassland/arable that is deemed suitable by the ECOW.</li> <li>• Oversee installation of protective fencing to valued habitats (reens, ditches and hedgerows)</li> <li>• Oversee vegetation removal in areas with potential for grass snake.</li> <li>• Oversee installation of great crested newt fencing and translocation as detailed in Appendix 4.</li> </ul>

term ID	nature of conservation value
1.1	<b>General</b> Construction Environmental Management Plan
1.2	ecological clerk of works

### 3.3. Pre-Construction phase

Table 1 identifies mitigation measures to be adopted prior to the start of works.

Table 1. Mitigation measures to be adopted prior to the construction phase.

I  
A





--	--	--	--	--	--

---

resultant mitigation to  
be based on the most

---

any areas of managed  
able by the ECoW.  
s and site  
velopment.

---

responsible team: Client

---

s with potential to  
ing HDD.

appling mitigation  
f scrub at boundaries,  
if predator fences  
n protected species  
bare areas following

ortnightly basis

---

intractor

e of materials, ground  
ion within the buffer

---

ible team: Client and  
ensure the assessme  
ed during construction  
distribution of these spe

---

ible team: Client and  
ides scrub, hedgerow  
/arable that is deeme  
depend on the timing  
ment immediately prio

managed for the benefit

---

	<p>able buffer from all          W this buffer will          e 7 metres.</p> <p>ence approved by the</p>
	<p>be completed by the          pment. These will be</p> <p>ng rigs for HDD along</p> <p>h to August inclusive),          W prior to          to damage the          cks have fledged. The          y fence (Appendix 5).</p> <p>be in place prior to the          nstruction period. This          redator fencing</p> <p>be in place prior to the          ne construction</p>

	<p><b>Habitats</b> Reens, ditches and hedgerows</p>
<p><b>Species</b> Badgers, Otter and Water Vole</p>	<p>Breeding birds</p>
<p>Breeding birds - Lapwing</p>	<p>Over wintering Lapwing</p>

	1.3		1.4		1.5		1.6		1.7
--	-----	--	-----	--	-----	--	-----	--	-----

--	--	--	--	--	--	--	--	--	--

	<p>Areas with potential for Grass Snake likely to be affected by construction activities will be de-vegetated prior to any site activities under the supervision of the ECoW. Grassland to be removed will initially be strimmed to a height of no more than 20cm, having first used an ecologist to walk and beat the habitat. This will encourage reptiles to disperse naturally into the neighbouring uncultivated vegetation to the sides. After at least 24hrs, a second cut will be made as close to ground/bank level as possible.</p> <p>This de-vegetation cannot proceed until nesting bird checks have been completed.</p> <p>Prior to works commencing in field 22 and 23 in the east, a suitable temporary fence will be constructed under direct guidance of the ECoW at the green/ditch buffer edge to ensure Crested Newts do not enter the construction site as detailed in Appendix 4. Areas within the fence will be subject to trapping and any Great Crested Newts captured will be placed in suitable habitat outside the fence and development footprint</p>	<p>22ha of existing grass and wintering Lapwing</p> <p>Responsible team: Client and CoW</p> <p>This includes scrub and areas of managed grassland/arable that is deemed suitable by the ECoW. This will depend on the timing of works and site management immediately prior to development.</p>
	<p>Prior to works commencing in field 22 and 23 in the east, a suitable temporary fence will be constructed under direct guidance of the ECoW at the green/ditch buffer edge to ensure Crested Newts do not enter the construction site as detailed in Appendix 4. Areas within the fence will be subject to trapping and any Great Crested Newts captured will be placed in suitable habitat outside the fence and development footprint</p>	<p>Responsible team: Client and CoW</p> <p>A European Protected Species License will be required from Natural Resources Wales to allow the installation of this fence</p>
<p>stuary R, SPA SI</p>	<p>Wintering Lapwing mitigation detailed in Appendix 3 will be in place prior to the first wintering season (October to March) within the construction period.</p>	<p>Responsible team: Client</p> <p>22ha of existing grassland will be managed for the benefit of wintering Lapwing</p>

1.8	Grass Snake
1.9	Great Crested Newt
	<b>Statutory nature conservation sites</b>
1.10	Severn RAMSA and SS

	Avoidance/mitigation	Comments
<b>General</b> Environmental Plan	The Construction Environmental Management Plan (C MIP) will be adhered to.	Responsible team: Construction team and ECoW
<b>Habitats</b>		

Item ID	Feature of nature conservation value
2.1	Construction Management

Table 2 identifies mitigation measures to adopted during construction works.

Table 2. Mitigation measures during the construction phase.

I A





--	--	--	--	--	--	--	--

---

Construction team

access, storage of  
disturbance, burning or  
in the fenced areas  
im: Construction team

---

im: Construction team

im: Construction team

im: Construction team

---

Construction team

access, storage of  
disturbance, burning or  
in the fenced areas  
im: Construction team  
Construction team and

--	--	--	--	--	--	--	--





ow be retained during  
by a suitable

ding with a suitable

parately and replaced  
with a suitable grass

horizontal Direct Drilling

ve some means of  
ling board at one end.

allow any Badger

any badger sett

ny water vole

will be retained during

d ditches detailed in

it by a suitable tempor

il to October inclusive.  
ged to deter breeding  
ar basis (Appendix 5).  
g birds.





oute – reen, ditch and  
ows

uatic invertebrates,  
plants and  
eed/water nesting bird

itches and hedgerows

and floodplain grazing

---

---

---

---

---

---

---

---

---

---

2.2	
2.3	
2.4	
2.5	
2.6	
2.7	
2.8	
2.9	

--	--	--	--	--	--	--	--	--	--

ing birds - Lapwing	Breeding Lapwing mitigation detailed in Appendix 2 will be in place prior to the first bird nesting season (March to August) within the construction period, and will be retained for whole of the construction phase.	Responsible team: Client 12ha of existing grassland will be managed for the benefit of nesting Lapwing
Overwintering Lapwing	Wintering Lapwing mitigation detailed in Appendix 3 will be in place prior to the first wintering season (October to March) within the construction period, and will be retained for whole of the construction phase.	Responsible team: Client 22ha of existing grassland will be managed for the benefit of wintering Lapwing
<b>Statutory Nature Conservation Sites</b>		
Gwent Levels – Redick and Llandeenny SSSI	No works within 12.5 metres of reens and 7 metres of ditches. Reens/ditch crossings will be achieved across existing bridges.  Adoption of suitable CEMP.	Responsible team: Construction contractor  There should be no access, storage of materials, ground disturbance, burning or contamination within the fenced areas Responsible team: Client
Stuary RAMSAR, SPA SI	Wintering Lapwing mitigation detailed in Appendix 3 will be in place prior to the first wintering season (October to March) within the construction period and will be retained during the operational period.	22ha of existing grassland will be managed for the benefit of wintering Lapwing

2.10	Breed
2.11	
2.12	
2.13	Severn and SS

Avoidance/mitigation	Comments
<p>Buffers to reens, hedgerows and ditches detailed in 1.3 will be retained during the operational phase.</p> <p>Existing gateways will be used for site access.</p> <p>Permanent access tracks will be seeded with a suitable grass mix through hydro-seeding.</p>	<p>Responsible team: Solar park operator</p> <p>Responsible team: Solar park operator</p> <p>If any changes to grazing/management are required during the lifetime of the project, it</p>

Item ID	Feature of nature conservation value
3.1	<b>Habitats</b> Reens, ditches and hedgerows
3.2	Coastal and floodplain grazing marsh

Operational phase

Table 3. Details mitigation measures to be adopted during the operational phase

Table 3. Mitigation measures during the operational phase.

I  
A





advance in writing with and NRW.	
n: Solar park operator	
Solar park operator and	
Solar park operator	
land will be managed ng Lapwing	
n: Solar park operator	
Solar park operator	
access, storage of disturbance, burning or n the buffer areas	

---

---

---

---

r park operator  
nd to the south will be  
of wintering Lapwing

---

---

r park operator  
nd to the south will be  
of wintering Lapwing

--	--	--	--	--	--	--	--	--	--





is may change during  
ices and

ent will be managed to  
elopment. This will be  
ditches remain in  
t. See Appendix 6.

table scrapes to allow  
site. The locations

for operational phase.

for operational phase.

y in late September to  
structure with nesting

e Appendix 6)

be retained during the

island sward.  
ce prior to the first  
nd and will be retained



---

---

---

---

Breeding birds -  
Lapwing

Over wintering  
Lapwing

Shrill Carder bee

**Statutory nature  
conservation sites**

Gwent Levels –  
Redick and  
Llandeenny SSSI

Severn  
RAMSA  
SSSI

---

---







<p>Monitoring of ditches, hedgerows, buffer grass and grass and beneath the solar panels will occur on an annual basis for the first five years following construction.</p>	<p>Responsible team: Solar park operator</p> <p>After this period, the results of monitoring will be assessed to inform a new five-year Management Plan.</p>
<p>Monitoring of land managed for wintering Lapwings will occur on an annual basis for the first five years following construction.</p>	<p>Responsible team: Solar park operator</p> <p>After this period, the results of monitoring will be assessed to inform a new five-year Management Plan.</p>
<p>Monitoring of land managed for breeding Lapwings will occur on a two-monthly basis for the first six months following creation. Following successful formation of a suitable habitat for breeding Lapwing, monitoring will occur on an annual basis for the first five years following construction.</p>	<p>Responsible team: Solar park operator</p> <p>After this period, the results of monitoring will be assessed to inform a new five-year Management Plan.</p>
<p>Aquatic flora and aquatic invertebrate surveys of ditches and reens will be updated in the first suitable period (Spring/summer). This will include both the development site and the breeding and wintering Lapwing mitigation areas. After this period, surveys will be repeated every year for the first 5 years of operation, after which the need for monitoring will be assessed in consultation with NRW.</p>	<p>Responsible team: Solar park operator</p>
<p>Shrill Carder Bee surveys will be updated and will map suitable foraging and nesting habitat across the development site and the breeding and wintering Lapwing mitigation areas, along with a survey of the bees. After this period, surveys will be repeated every year for the first 5 years of operation, after which the need for monitoring will be assessed in consultation with NRW.</p>	<p>Responsible team: Solar park operator</p> <p>Precise methodology will be in agreement with NRW but will be repeatable along agreed transect routes with sampling every 10 metres.</p>

3.10	On-site habitats
3.11	Wintering Lapwing mitigation
3.12	Breeding Lapwing mitigation
3.13	Aquatic plant and invertebrate monitoring
3.14	Shrill carder bee monitoring

Avoidance/mitigation	Comments
----------------------	----------

Item ID	Nature of conservation value
---------	------------------------------

### 3.4. Decommissioning phase

Table 4. Details mitigation measures to be adopted during the decommissioning phase

Table 4. Mitigation measures during the decommissioning phase.





responsible team: commissioning team
responsible team: commissioning team
responsible team: commissioning team
responsible team: commissioning team
responsible team: commissioning team
responsible team: commissioning team
responsible team: commissioning team

--	--	--	--	--	--	--	--	--	--

---

g management plan

---

d with NRW prior to

---

moved and the land

---

n decommissioning.

---

p normal agricultural

---

p normal agricultural

---

re decommissioning  
will be delineated

---

<b>General</b>
<b>Habitats</b> Reens, ditches and hedgerows
<b>Coastal and floodplain grazing marsh species</b>
<b>Breeding Lapwing</b>
<b>Statutory nature conservation sites</b>

---

---

---

---

---

Crested Newt,  
Belted Kingfisher, Otter and Water

for wintering Lapwing

---

---

---

---

---

Levels – Redick and  
Jenny SSSI

---

---

---

---

---

4.1
4.2
4.3
4.4
4.5
4.6
4.7





## 4. Management plan

### 4.1. Aim and objective

The aim of the Management Plan is to ensure the long-term management and maintenance of ecological features during the operational phase of the Solar Park. The overarching objectives are:

- To promote wildlife value and species diversity whilst maintaining the existing local landscape character;
- To secure the appropriate management of Gwent Levels Redwick and Llandevenny SSSI interest features;
- To ensure that other existing ecological features are retained, connected and sensitively managed to maximise their ecological value in the long-term;
- Provide opportunities for a range of faunal species;
- To apply good horticultural and ecological practice to all operations; and,  
To monitor the Site and adjust management prescriptions as necessary.

The key management features for the purpose of this report are:

1. Habitat compensation for breeding Lapwing (see Appendix 2)
2. Habitat compensation for over wintering Lapwing (see Appendix 3)
3. Watercourses (reens and ditches) and associated flora and fauna
4. Hedgerows
5. Coastal and floodplain grazing marsh
6. Buffers between the security fence and reens/ditches and hedgerows
7. Grassland beneath solar panels
8. Bat and breeding bird boxes

### 4.2. Reens

Main reens are currently managed by NRW. This body is likely to continue to manage these features for the operational period of the solar park.

### 4.3. Ditches

The majority of ditches associated with field boundaries have been unmanaged, which has resulted in them becoming overgrown with scrub. Management of the overgrown ditches will not be possible without scrub removal.

To allow long-term management and improve the ecological value of field ditches to bring them into a favourable condition, hedgerow removal will take place. Currently, approximately 80% of ditches (by length) are either shaded or dry due to the presence of dense native shrub hedgerows. This shading inhibits the establishment of aquatic plants and associated invertebrates that are interest features of the Gwent Levels Redwick and Llandevenny SSSI.

It is proposed that all ditches within the two field blocks associated with the development will be managed through scrub removal and casting. This will be completed over a 7-year cycle with subsequent management occurring on a rolling seven-year program.

A Ditch Management Plan is provided in Appendix 6.

#### 4.4. Hedgerows

The aim of management is to ensure retained hedgerows are maintained with a good structure to provide connectivity for faunal species and support a diverse flora. The main objectives for hedgerow management are:

- Manage hedgerows on a regular, rotational basis to promote structural and botanical diversity;
- Maintain the connectivity of the Site to facilitate the movement of wildlife through and across the Site;
- Provide visual screening where required and deliver good integration of the development into the landscape;
- Enhance gappy hedgerows to increase biodiversity, connectivity and strengthen local landscape character; and,
- Allow and encourage a diverse ground

flora to develop along hedgerow bases.

#### Additional plantings

Any large (>2m) gaps in hedgerows on the northern side of ditches will be in-filled with native hedgerow species. This will comprise: shrubs and trees of local provenance on the Gwent Levels tree list, and the species mix will reflect the mix within the adjacent hedgerow sections. Prior to planting, locations will be agreed in writing with the planning authority and NRW.

Hedging will be planted in two staggered rows at a density of not less than 5 per metre, with approximately 450mm between plants in the same row, and 300-400mm between rows. Hedgerows are best planted between November and March, avoiding periods of heavy frost. When planting, it is important to avoid windy conditions as these can rapidly dry out barerooted plants and kill them. Where this is not possible, ensure that the roots of the young trees are not exposed to the wind or sun so that they remain moist.

Watering: Immediately after planting, thoroughly and without damaging or displacing plants or soil.

Firming: Lightly firm soil around plants and fork and/or rake soil, without damaging roots to a fine tilth with gentle cambers and no hollows.

The hedge will be 60cm tall when planted. Trees will be supplied as whips and will be planted at regular intervals within the hedgerows.

#### Plant handling

- Bare-rooted planting stock is invariably delivered from the nursery in plastic, lightproof bags and should be stored upright in cool conditions away from direct sunlight. If they are to be stored for long periods (more than a few days), they should be re

moved from the bags and 'heeled in' to prepared trenches with the roots completely covered in well-cultivated soil until they can be planted.

#### Hedge planting technique

- Notch planting insert spade and rock back and forth to form a notch. Insert roots well down into notch. Pull the plant upwards a little to straighten the roots. Firm the soil lightly with heel to exclude air.

#### Management of additional plantings

- Maintain a weed free area around each tree and shrub, minimum diameter the larger of 1 m or the surface of the original planting pit.
- Tree stakes, if required, should be inspected annually as follows:
  - Check stakes for looseness, breaks and decay, and replace as necessary to original specification. If a tree with a defective stake has grown sufficiently to become self-supporting, remove stake(s) and fill the hole(s) with lightly compacted soil.
  - Adjust, refix or replace loose or defective ties as necessary, allowing for growth since planting and to prevent chafing. Where chafing has occurred, reposition or replace ties to prevent further chafing.
  - Where stakes are longer than half the height of the clear stem of the tree, cut the stake to this height in spring and retie to tree firmly but not tightly with a single tie.
  - Remove redundant tapes, tags, ties, labels and other encumbrances.
  - Remove stakes and ties during spring when no longer required to support tree.
- Plants/shrubs that have failed to thrive will be rectified and replaced with equivalent plants/shrubs. Replacements will match the size of adjacent or nearby plants of the same species. Making good will occur during the next suitable planting season.
- The new plantings will not be cut in the first growing season. In the second year the previous season's growth will be trimmed back between November and early March by approximately half to encourage bushy growth. In the third year the lateral and lead branches and shoots will be trimmed back to give a more even shape.
- After any new section of hedgerow has become established (potentially after 3 years), mechanical trimming will be used.

#### Established hedgerows

Management of established hedgerows will aim to create a continuous, moderately high bushy structure with a diversity of fruit and flowers available throughout the year.

- Hedgerows solely comprising native shrubs will be managed to maintain a minimum height of 3.5m.
- Hedgerows will be managed on rotation (except in areas where safety/ visibility dictates otherwise), with each hedgerow cut every 2-3 years
- Only one side of each hedgerow will be cut in any given year;
- Trimming must take place during November to February inclusive to avoid the breeding bird season and minimise effects on Dormice, preferably in January - February to allow foraging opportunities for wildlife through the winter.

#### 4.5. Grassland buffers adjacent to reens, ditches and hedgerows

Grassland management within buffer areas will aim to create a more diverse sward through natural succession.

There will be no net reduction in grassland habitat area across the Site as the existing arable areas will be planted to grassland. The aim of management is to:

- Manage the areas of buffer grassland to enhance the ecological value of the grassland;
- Maintain the connectivity of the Site to facilitate the movement of wildlife through and across the Site;
- Prevent the build-up of fertility by removing cuttings;
- Monitor and manage, as appropriate, the spread of scrub and invasive species;
- Provide easy access to allow management of boundary features.

#### First year following construction

In the first autumn following construction, any bare ground will be seeded with a suitable grass mix, as the soils are significantly improved and unlikely to develop a diverse sward without some additional seeding. A suitable seed mix will take into account advice of NRW on the introduction of species not usually found with the Gwent Levels and would include Red Clover and Common Knapweed.

#### Management

Buffer grassland will be managed by taking a single hay cut in late September onwards. This will be done using a mower set to approximately 50mm. Cut hay will be left to dry and shed seed for 1-7 days and the resulting hay removed. This can be used as animal fodder.

Encroaching scrub will be removed annually outside the bird nesting season.

No chemical fertilizer or insecticide inputs will occur within this habitat.

Grassland will be maintained in a healthy vigorous sward, free from disease, fungal growth, discolouration, scorch or wilt.

In a central swathe through the site (Map 2 yellow areas), 7.7ha of grassland will be cut for hay in late September, and will be enhanced for Shrill Carder Bee through additional plantings into bare areas created by disturbance (e.g. harrowing) and comprising a species mix agreed with NRW but including *Lotus corniculatus*, *Trifolium arvense* and *Centaurea nigra*.

Following comments from NRW, soil sampling has been completed in areas for additional planting (see Appendix 8). As would be expected in productive agricultural land, phosphorus levels are high and until soil levels drop, the grassland mix will rely on phosphorus tolerant species including the three species listed above, along with native thistles. Potassium levels appear generally supportive of grassland creation for shrill carder bee, as do nitrogen levels.

Cut hay will be left to dry and shed seed for 1- 7 days and the resulting hay removed.

To further enhance this area by providing potential Shrill carder nesting habitat, hay mowing on the northern banks of ditches (not reens) should be haphazard with the aim of leaving 5% of grass uncut per annum.

It is expected that should permission be given, a detailed management plan for approval by the relevant authority, would be required through conditions.

#### 4.6. Grassland beneath solar panels

The aim of management beneath solar panel is to;

- Minimise shading of solar panels;
- Provide forage for low numbers of sheep;
- Enhance the ecological value of the grassland

In the first autumn following construction, any bare ground will be seeded with a suitable commercial grazing mix for beneath panel habitats.

##### Sowing

Seed can be sown by surface broadcasting. Rolling is not usually needed for autumn applications as the weather will settle the seed to the soil.

##### First year management to be applied to newly sown areas only

Most sown grass species are perennial; they will be slow to germinate and grow and will not usually flower in their first growing season. There will often be a flush of annual weeds from the soil in the first growing season which may grow up and obscure the meadow seedlings beneath. This annual weed growth is easily controlled by topping or mowing.

Areas of retained grassland and sown areas associated with the panels will be managed together after the first year. The area beneath the panels will be grazed by sheep at suitable stocking levels (around 6-8 animals per ha) with the security fence preventing these animals accessing the buffer habitats to ditches and reens.

Weeds and scrub will be controlled by targeted application of a suitable herbicide. Herbicide will not be used where GCN may be present.

No chemical fertilizer or insecticide inputs will occur within this habitat.

Any changes in management during the lifetime of the solar farm will be agreed in writing in advance of such changes with the planning authority and NRW.

#### 4.7. Bat and breeding bird boxes

The aim of the Bat and breeding bird box scheme is to provide additional habitats for roosting bats and breeding birds.

Ten woodcrete bat boxes and 10 woodcrete bird boxes suitable for birds that nest in cavities will be fitted onto trees surrounding the site. These are detailed in Table 5 with indicative locations shown on Map 2. Final locations will be agreed in consultation with a suitably qualified ecologist.

Table 5. Bird and bat boxes

Item ID	Type	Number	Comments
T5.1	Bird nest box: Schwegler 1B (32mm entrance)	5	Hung at a height of 1.5 metres or higher. Nest boxes should be angled so that they face away from the prevailing wind (usually south-westerly in the UK). The chances of occupation are higher if there is good tree (particularly oak) or hedge cover nearby as these will provide a good source of insect food for the nestlings when they hatch.
T5.2	Bird nest box: Schwegler 1B (26mm entrance)	5	Hung at a height of 1.5 metres or higher. Nest boxes should be angled so that they face away from the prevailing wind (usually south-westerly in the UK). The chances of occupation are higher if there is good tree (particularly oak) or hedge cover nearby as these will provide a good source of insect food for the nestlings when they hatch.
T5.3	Bat box: 2F Schwegler	10	The 2F bat box can be sited on a tree or building and is best positioned at a height of between 3 to 6 metres in an open sunny position. A group of 2 to 3 boxes facing in different directions will provide a variety of micro-habitats.

## 5. Monitoring

### 5.1. Introduction

Monitoring is fundamental to the success of this management plan and is required to assess biodiversity changes and identify potential issues. It allows an informed assessment of any changes to be identified, when compared to baseline data. This will enable the effectiveness of mitigation or compensation to be identified.

The lifetime of the solar scheme is likely to be 35 years. Every five years during operation, the management activities will need to be reviewed against the condition of the site, and a new five-year Management Plan produced.

A Management Plan related to decommissioning will also be required to ensure that solar panel removal does not have a negative impact on biodiversity. An adaptive management approach should be adopted whereby the results of monitoring feedback into the appropriate management of the Site.

A summary or proposed monitoring is provided in Table 6.

## 5.2. Invertebrate and aquatic flora monitoring

The following baseline data will be collected in the first survey season after granting of permission:

- aquatic flora and aquatic invertebrate surveys of ditches and reens will be updated in the first suitable period (Spring/summer). This will include both the development site and the breeding (Appendix 2) and wintering (Appendix 3) Lapwing mitigation areas. A manual for the survey and evaluation of published by Buglife. ~~the plant and invertebrate assemblages of ditches~~
- Shril Carder Bee surveys will be updated and will map suitable foraging and nesting habitat across the development site and the breeding and wintering Lapwing mitigation areas, along with a survey of the bees. This will comprise fixed transects walked through the Shril Carder Bee area (Map 2) and the Lapwing mitigation areas with a 1m quadrat sample of % cover of food plants being recorded every 10 metres. In addition, timed transects will record observations of Shril Carder Bee along the same transect route. These should be done by a suitably experienced ecologist and in suitable weather conditions.
- This methodology will be agreed with NRW.

After this initial baseline survey, surveys will be repeated every year for the first 5 years of operation, after which the results and the need for monitoring will be discussed in consultation with NRW. If necessary, further enhancement work may be required and would be agreed in discussion with NRW.

The following baseline data will be collected in the first survey season after construction of the solar farm:

- Survey of egg-laying invertebrates on solar panels to determine if any of the interest feature species of Gwent Levels SSSI are egg-laying on panels. This should comprise near-dusk observations of egg laying attempts on solar panels adjacent to both sides of the central reen during suitable weather and at a suitable time of year. This will need to be completed by an ecologist that is familiar with the aquatic invertebrate fauna at this site and should be complemented by searches of the panels to detect actual egg-laying.

If no egg-laying is observed, surveys will be repeated in years 5 and 10 of operation, after which the need for monitoring will be assessed in consultation with NRW.

If egg-laying by interest feature species of Gwent Levels SSSI is observed, a mitigation strategy will be adopted with suitable monitoring of mitigation outcomes agreed.

### 5.3. Habitats

Monitoring of ditches, hedgerows, buffer grassland (excluding Shril Carder Bee area see 5.2.) and grassland beneath the solar panels will comprise a pre-construction surveys in the first following permission being given, followed by monitoring surveys in year 2 -5 post construction.

Monitoring will be completed by a suitably qualified ecologist who will assess the floral species diversity and make recommendations if issues are encountered.

Details on the monitoring of ditches to be managed to provided enhancement for the Gwent levels SSSI is provided in the Ditch Management Plan.

Reen management is completed by NRW and a such a monitoring scheme will need to be agreed with them.

#### Hedgerows

Hedgerows at the site are already established although new management is proposed.

Indicators to be assessed will include:

- No encroachment into adjacent ditches and grassland.
- A bushy hedgerow at least 3.5 metres high
- No gaps greater 2 metres
- Large willow shading ditches and reens managed (coppiced)
- Absence of non-native species

#### Buffer grassland

Buffer grassland will be monitored in June/July to assess the success of management.

Indicators to be assessed will include:

- Areas sown with additional wildflowers thriving
- Areas of bare ground less than 5%
- Negligible scrub encroachment
- Increased forb and grass diversity
- Ruderal weeds rare or absent
- Presence of non-native species

#### Grassland beneath solar panels

Grassland beneath solar panels will be monitored in June/July to provide an understanding of how species composition changes over time. This will comprise at least 30 x fixed 1m<sup>2</sup> quadrats recording the following:

- Records of all plant species rooted within a given
- quadrat;
- Estimates of cover by each species;

Site selection will be determined by precise layout but would ideally include 10 quadrats in shaded habitats beneath panels, 10 quadrats in areas between panels, and 10 quadrats inside the security fence, but unshaded the majority of the time.

After this period, the results of monitoring should be assessed to inform a new five-year Management Plan. Monitoring of ditches to inform the ditch management program will be required through the lifetime of the project.

#### 5.4. Ornithology

Monitoring of land managed for wintering Lapwings will occur on an annual basis, during winter months, for the first five years following construction. It will be completed by a suitably qualified ecologist who will assess the habitat types within the mitigation area and make recommendations if issues are encountered.

Monitoring of land managed for breeding Lapwings will occur on a two-monthly basis for the first six months following creation. It will be completed by a suitably qualified ecologist who will assess the habitat types within the mitigation area and make recommendations if issues are encountered. Following successful formation of a suitable habitat for breeding Lapwing, monitoring will occur on an annual basis for the first five years following construction.

#### 5.5. Other fauna

Ditches/reens across the site should be monitored for the presence of water voles once every 5 years to establish whether the potential benefits for water voles of the proposed ditch management are realised.

Table 6. Summary of proposed monitoring

<b>Feature</b>	<b>Initial monitoring</b>	<b>Subsequent monitoring</b>	<b>Comments</b>
Aquatic flora and aquatic invertebrate within ditches and reens within the application site and breeding and wintering lapwing mitigations areas	First survey season after granting of permission	Annually in year 2-5 following construction	After this initial period the need for monitoring will be assessed in consultation with NRW.
Shrill Carder Bee habitat within the application site and breeding and wintering lapwing mitigations areas	First survey season after granting of permission	Annually in year 2-5 following construction to include soil sampling.	After this initial period the need for monitoring will be assessed in consultation with NRW.
Egg laying insects on panels	First survey season after construction of the solar farm	If no egg-laying is observed, surveys will be repeated annually for the first 2 years of operation	If egg-laying by interest feature species of Gwent Levels SSSI is observed, a mitigation strategy will be adopted with suitable monitoring of mitigation outcomes agreed.
Ditches	First management visit	During subsequent management visits. An assessment of scrub encroachment on ditch banks will undertake annually.	See Appendix 6
Reens, hedgerows and grassland	First survey season after construction of the solar farm	Annually in year 2-5 following construction	It should be completed by a suitably qualified ecologist who will assess the floral species diversity and make recommendations if issues are encountered including encroachment of scrub, ruderal herbs and presence of non-native species.
Grassland beneath panels	First survey season after granting of permission	Annually in year 2-5 following construction	To provide an understanding of how species composition changes over time
Wintering lapwing habitat	First survey season after granting of permission	Annually in year 2-5 following construction	It will be completed by a suitably qualified ecologist who will assess the habitat types within the mitigation area and make recommendations if issues are encountered.
Breeding Lapwing mitigation land	Twice every month in the first survey season after granting of permission	Following successful formation of a suitable habitat for breeding Lapwing, annually for the first 5 years of operation	

## 6. Decommissioning

After operation it is likely that the site will be restored to its original condition. Prior to any restoration, habitats will be assessed by a suitably qualified ecologist to determine their value and potential to support species of restricted distribution. These pre-decommissioning surveys will establish the value of the site for biodiversity and form the basis of a formal decommissioning strategy for biodiversity.

NRW have requested information on how the long-term shading could affect the soil fauna and suitability of the land to be returned to grassland and land appropriate for agricultural use after decommissioning.

Work in US (Choi et al, 2020<sup>1</sup>) suggests that soil moisture within the solar PV site was greater than in a reference area, although this was not statistically significant. Carbon levels were reduced in soils within the solar PV site, but this was thought to be due to topsoil stripping prior to construction, an effect that would not occur at this site.

Work in the UK (Armstrong et al, 2016<sup>2</sup>) found that above ground plant biomass was four times higher in gaps between solar panels than it was beneath the panels, with fewer species beneath the panels also. They also looked at a number of soil properties including total carbon and nitrogen, bulk density, particle size distribution and microbial carbon and nitrogen. These did not vary between the treatments (under arrays, in gaps and control areas).

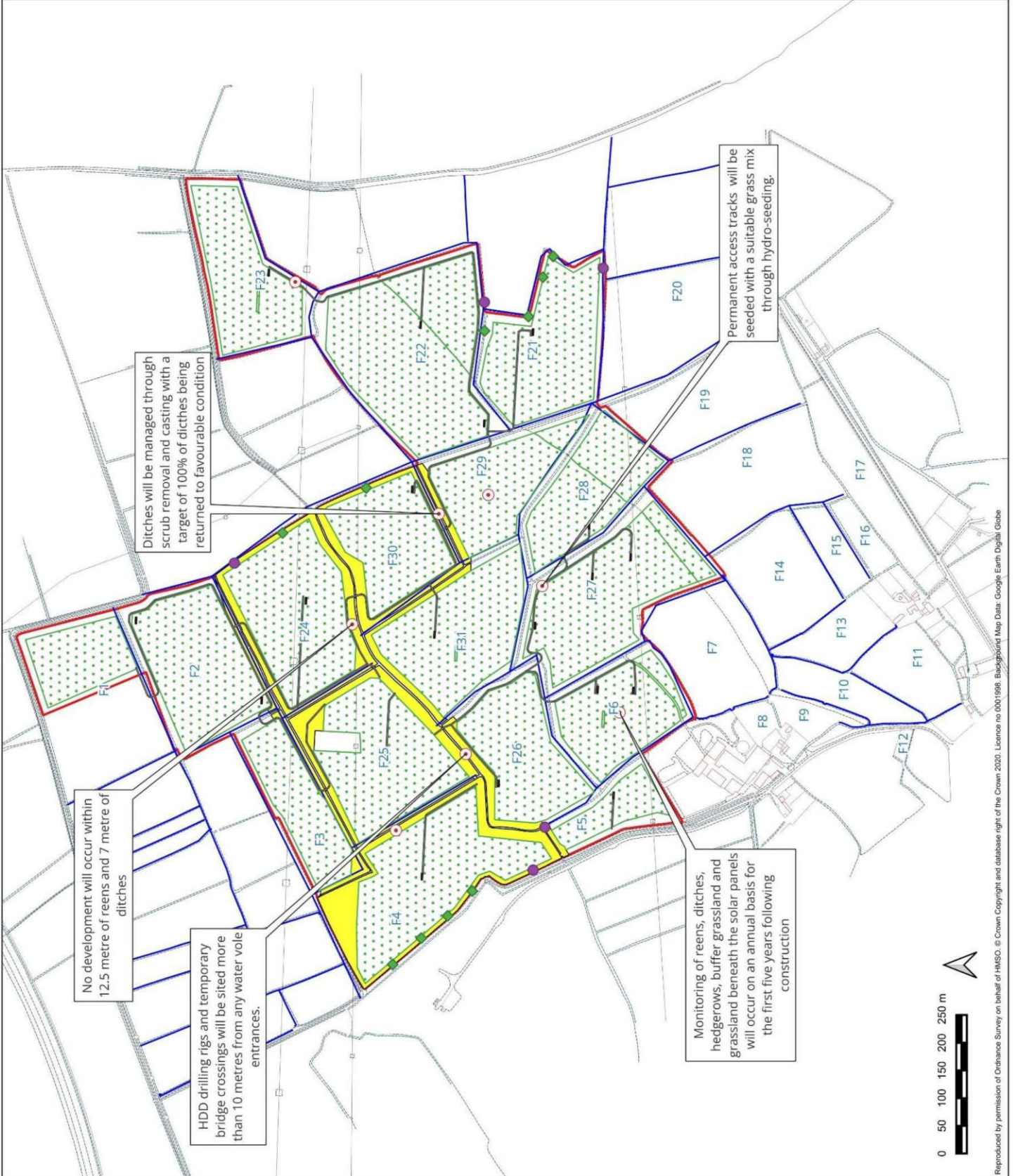
This is an emerging area of study in academia and sufficient information is not available to allow an informed and robust assessment of the long-term effects of shading of solar PV arrays on soil fauna. To help in these studies the developer has agreed to allow access to the site for academic research into this effect.

---

<sup>1</sup> Choi CS, Cagle AE, Macknick J, Bloom DE, Caplan JS and Ravi S (2020) Effects of Revegetation on Soil Physical and Chemical Properties in Solar Photovoltaic Infrastructure. *Front. Environ. Sci.* 8:140. doi: 10.3389/fenvs.2020.00140

<sup>2</sup> Armstrong, A.B., Ostle, N.J., Whitaker, J. (2016) Solar park microclimate and vegetation management effects on grassland carbon cycling. *Environmental Research Letters.* 11, p 1-11.

---



No development will occur within 12.5 metre of reens and 7 metre of ditches

HDD drilling rigs and temporary bridge crossings will be sited more than 10 metres from any water vole entrances.

Ditches will be managed through scrub removal and casting with a target of 100% of ditches being returned to favourable condition

Monitoring of reens, ditches, hedgerows, buffer grassland and grassland beneath the solar panels will occur on an annual basis for the first five years following construction

Permanent access tracks will be seeded with a suitable grass mix through hydro-seeding.

0 50 100 150 200 250 m



## Appendix 1 - semi-aquatic mammals associated with reens

### Mitigation for Otter

Otter, and their breeding or resting places (holts and couches), are protected under the Wildlife and Countryside Act 1981 (as amended), and The Conservation of Habitats and Species Regulations 2017. They are identified as European Protected Species. Under these laws, it is an offence to:

- 
- Capture, kill, disturb or injure otters (deliberately or by not taking enough care)
- Damage or destroy a breeding or resting place (deliberately or by not taking enough care)
- Obstruct access to their resting or sheltering places (deliberately or by not taking enough care)
- Possess, sell, control or transport live or dead otters, or parts of otters.

Otter are listed under Section 7 of the Environment (Wales) Act 2016.

Otter surveys were completed in Spring 2020. Although no evidence of Otter was recorded associated with the reens, the records search strongly suggests they are present in the general area. However, the site has no evidence of holts or couches and it is extremely unlikely that Otter are resting here.

An update survey should be completed prior to construction activity. If an Otter resting place is found, the location of HDD and panels should be modified to be more than 30 metres from the resting place. If this is not possible, the occupation of the resting place will be ascertained with certainty using motion detection cameras, and if necessary a European Protected Species Licence (EPSL) obtained from Natural Resources Wales to allow temporary disturbance during the construction phase.

It should be noted that the site will not be lit at night during the construction and operation phases, and therefore no light mitigation is required.

### Mitigation for Water Vole

Water Vole is protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under the Act it is an offence to:

- intentionally capture, kill, disturb or injure Water Voles (on purpose or by not taking enough care);
- destroy or block access to their places of shelter or protection;
- possess, sell, control or transport live or dead bats, or parts of them.

Water Vole are listed under Section 7 of the Environment (Wales) Act 2016.

Water Vole surveys were completed in Spring 2020. Although the majority of the site lacked recent evidence of Water Vole, a limited area within the centre of the site exhibited a high concentration of field signs of recent activity.

Appendix 1: Semi-aquatic mammal mitigation

Water Vole are known to be in the local area, and as the reens are generally well connected across the Site, it is safe to conclude that Water Vole are present across the wider site.

A Water Vole conservation strategy is provided in Appendix 5.7 of the ES (Water Vole Survey, Rush Wall Solar Park, August 2021 Report no: WVole-526.2) and includes:

- An update survey prior to construction to inform
- location of HDD rigs.
- Displacement methods if needed.
- Timing of ditch management works to autumn across much of the site during the operational period
- Ecological compliance audit

## Appendix 2 - Breeding Lapwing mitigation

At least 4 pairs of Lapwing were present in the survey area in 2024. However, no active nests or chicks were recorded, while there was a noticeable lack of typical breeding behaviour (such as agitation, courtship or mobbing). Based on this, it is considered unlikely that lapwing are currently successfully breeding within the Proposed Development Site.

A maximum of two pairs of Lapwing were recorded attempting to breed within the site during breeding bird surveys in Spring/Summer 2019, although it is unlikely they successfully fledged chicks due to land management in their nesting area.

Mitigation for loss of breeding Lapwing habitats will comprise 12ha of grassland which will be set aside for breeding Lapwing to the north east of the development (Map 3) and secured with legal agreements. Average Lapwing nesting territories are between 0.4 and 0.8ha<sup>3</sup>. This land has been managed by a different landowner to the development and has more suitable habitat for nesting Lapwing when compared to the proposed solar farm site, with only a slightly improved sward, few boundary features and more diverse grassland and herb community.

Currently the site comprises species-poor semi-improved grassland that is managed in a traditional manner through grazing and topping, and is enclosed by ditches with limited amounts of scrub.

As well as providing a valuable habitat for nesting Lapwing and other ground nesting birds, this will also provide additional habitat area for wintering Lapwing.

This area will be managed as follows:

1. No stocking in the period Feb to April.
2. After this period, low stocking density is possible: one cow/horse per ha in May and June to but no young livestock as they risk trampling of chicks.
3. Grazing will aim to keep a short sward across about 75% of the mitigation area during the nesting season.
4. Grazing is needed in the period Jul to Feb, outside the breeding season, to prepare the sward for the following breeding season. No restriction on stocking density in this period.
5. No applications of manure (organic or inorganic) during the period mid-March to end of June (egg laying, nesting and dependent chicks on the ground period).
6. Herbicides, if used, must be targeted on limited areas and will not be used where great crested newt may be present.

---

<sup>3</sup> See: <https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/lapwing/breeding-and-nesting-habits/>

- 
7. No mechanical works (tractors etc) will occur in the period mid-March to mid-June, as this will adversely affect egg laying, nesting and any dependent chicks on the ground.
  8. Hay cut can be taken after mid-July
  9. Creation of shallow scrapes will increase invertebrate numbers and provide a food resource for both adults and chicks. These will be agreed with the landowner, and will be in areas that naturally hold water already and are towards the centre of the mitigation area, away from any predators potentially associated with boundaries.
  10. Vegetation along ditch edges will be maintained at a low height (approximately 1m) to avoid creating habitat for ambush predators within the site and at its margins.
  11. Predator fencing will be added at the mitigation site boundaries, and woody scrub areas within the lapwing area will be managed to open up the landscape for this bird.

Monitoring of land managed for breeding Lapwings will occur on a two-monthly basis for the first six months following creation. It will be completed by a suitably qualified ecologist who will assess the habitat types within the mitigation area and make recommendations if issues are encountered. Following successful formation of a suitable habitat for breeding Lapwing, monitoring will occur on an annual basis for the first five years following construction after which it will be completed every five years.

During winter months, this land will provide additional habitat for over wintering Lapwing.

It is expected that should permission be given, a detailed management plan will be developed in consultation with the RSPB for approval by the relevant authority, would be required through conditions.

## Appendix 3 - Over wintering Lapwing mitigation

Winter and passage bird surveys were completed during the period 2018 to 2020, and 2024/2025 to identify its importance for this group of birds, in particular those species that may be interest features of nearby statutory nature conservation sites associated with the Severn Estuary.

The following birds that are over wintering interest features of the nearby statutory nature conservation sites were recorded here during the site visits:

- Wigeon, Teal, Pochard, Curlew and Bewick's Swan were only encountered in small numbers on a single visit. The site is of negligible value for these over wintering species associated with nearby statutory nature conservation sites.
- Shelduck were present on five occasions with a maximum of 5 birds on 25th February and 14th March 2020. No shelduck were recorded in 2024/2025
- Lesser Black-backed Gulls were present on five occasions with a maximum of 77 individuals on 7th March 2020.
- Snipe were recorded on 13 of the 32 survey visits with a maximum of 43 birds on 28th February 2020 . During the 2024/25 survey, large numbers were frequently recorded in the proposed mitigation area, with a maximum count of 72 birds. This would comprise 14.31% of the estuary population, while the average of 20 birds would comprise 4%.
- Mallard were recorded on 24 of the 32 site visits with a maximum of 50 birds on 13th October 2019.
- Lapwing were recorded on 21 of the 32 site visits with a peak of 164 birds on 27th November 2018.




An area of agricultural land to the south of the proposed solar farm will be managed for wintering birds. This comprises a group of 6 fields (Map 3) that will be managed under rotation such that in any given winter (October to March) at least 10ha is managed for wintering birds. In addition, breeding mitigation to the north of the development will be available for wintering birds, resulting in at least 22ha of habitat managed for wintering birds each year.

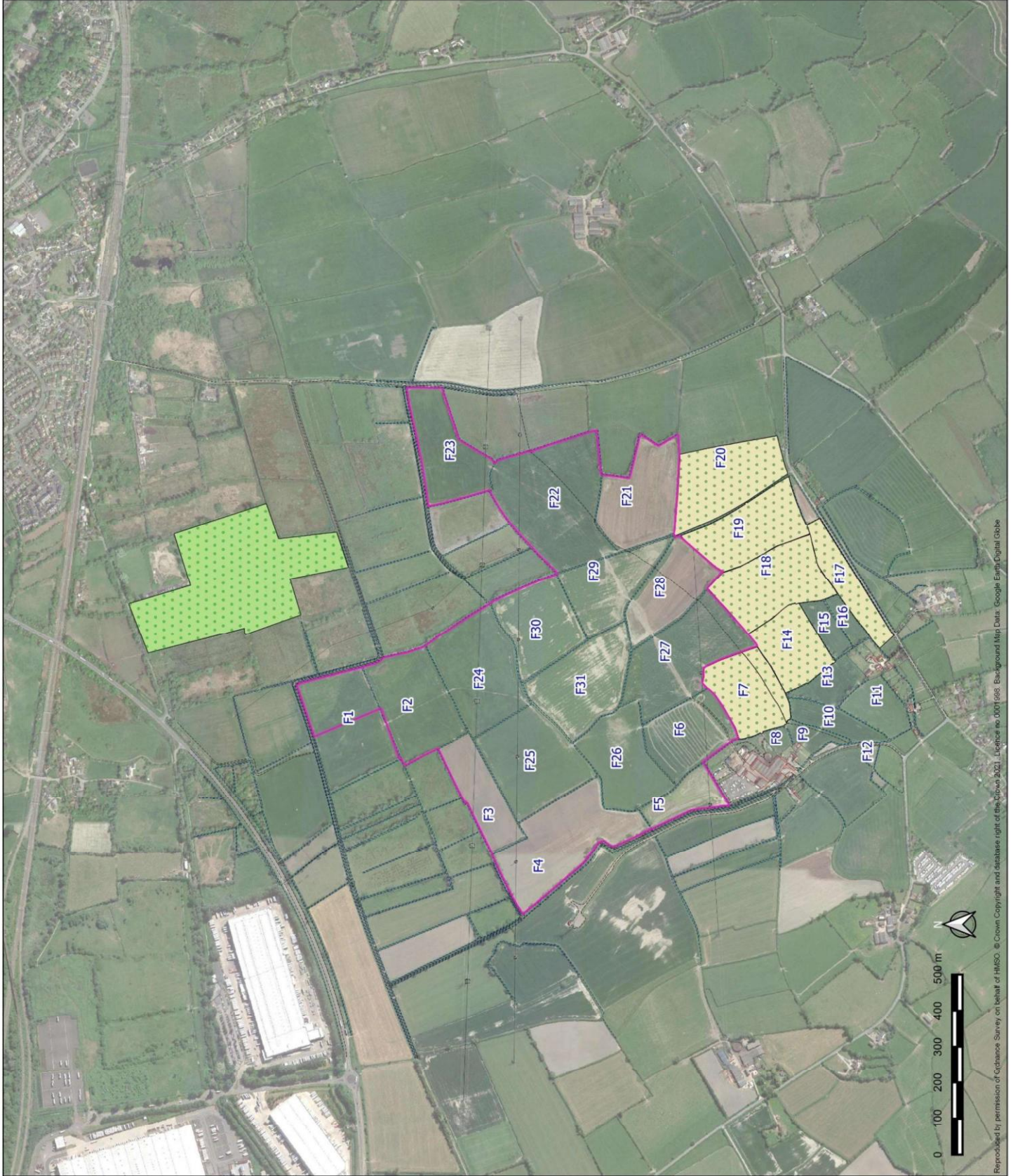
These areas will be managed as follows:

1. No dirty water from livestock spread in that area.
2. Well-rotted animal manure permitted.
3. Maintain a diversity of habitats such as stubble and short sward grazed wet grassland where invertebrates are plentiful during the over winter period
4. Maintain existing scrape type depressions which are subject to periodic flooding.
5. No undersowing into cereal/maize stubble on the mitigation land.
6. Over wintering period is defined as October to March inclusive.
7. Grazing by cattle and sheep in the winter months would be acceptable, as it will help maintain the short sward suitable for foraging Lapwing.

It is expected that should permission be given, a detailed management plan for approval by the relevant authority, would be required through conditions.

Appendix 3: Over-wintering lapwing mitigation

- Legend**
-  Operational development footprint
  -  Summer/winter mitigation
  -  Winter mitigation



Title: Map 3. Lapwing mitigation areas

Project: Rush Wall Solar Park

Checked by: CDH      Version: 04  
Date: 25/08/2021

## Appendix 4 - Great Crested Newt mitigation

Great Crested Newt eDNA surveys were completed on the 7 water bodies within the survey area in Spring 2019 and 2024.

In 2019 GCN eDNA was found within ditch 50 along the northern boundary of field F23. Other watercourses to the immediate west and south of the adjacent field F22 provided negative results, indicating that GCN are not present elsewhere with the eastern part of the development site. In 2024 GCN eDNA was only found within ditch 27/28 which is linked to ditch 50. This GCN eDNA is likely to be the result of a population centred to the east of the development site.

Activities that could adversely impact GCN relate to installation of the solar PV array, fencing, access tracks and electrical cabinets/cable routes within 500 metres of ditch 27/28 and ditch 50.

A GCN Conservation strategy has been developed and is provided in Appendix 5.5 of the ES (Great Crested Newt surveys) and includes:

- Requirement of a European Protected species
- License for works
  - Fencing development areas within 250 metres of ditch 27/08 and ditch 50 and completion of
- translocation program
- Protection of buffer habitats within 500 metres
- Timing of management for ditches in the vicinity to the period 1st November to 31st
- January.
  - Ecological compliance audit

A European Protected Species Mitigation Licence will be required to allow installation of the fence. The Licence application should be informed by an updated GCN eDNA survey.

Prior to issuing a licence, NRW will need to be confident that the 'Three Tests' are met as follows:

1. The proposed development must meet a purpose of 'preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.
2. There is no satisfactory alternative.
3. The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

Test 1 is met as the project meets a specific need in providing green energy.

Test 2 requires a consideration of alternatives. At this site, winter build out is not feasible due to poor ground conditions during wet periods. Although adjacent fields could be left in an undeveloped state, installation of solar panels elsewhere will isolate it from retained

operational areas of the farm. This would not a proportionate response to the low level of impact associated with this development.

This appendix provides the detail to ensure Test 3 is met.

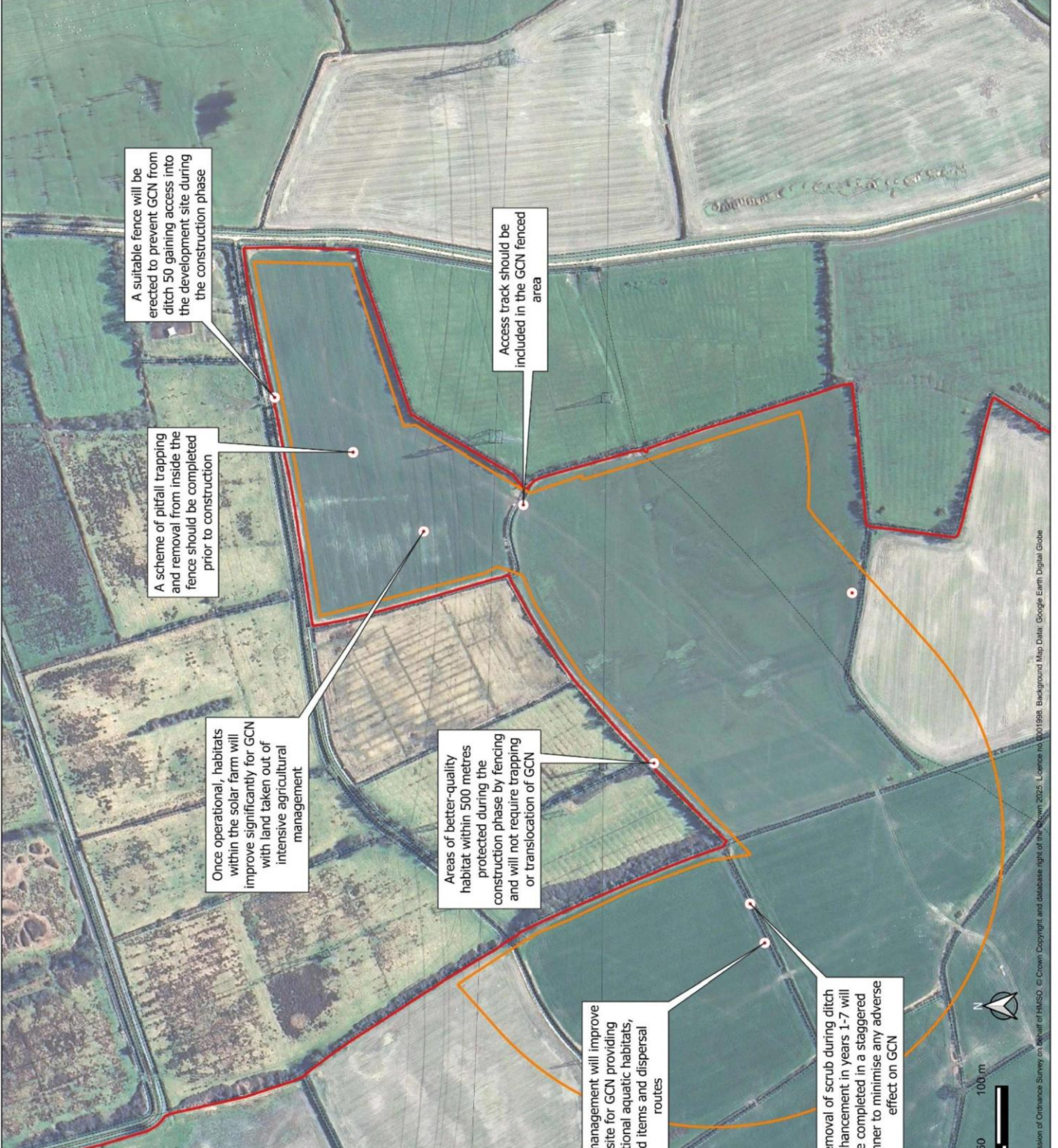
Due to difficulties associated with Natural Resources Wales during the Covid 19 emergency, it was not possible to consult with their amphibian lead prior to submission.

Appendix 4: Great crested newt mitigation



**Legend**

- Development footprint
- Target note
- GCN fence enclosing area to be cleared of GCN prior to construction



Title: Map 4. Great Crested Newt mitigation plan

Project: Rush Wall Solar Park

Checked by: CDH Version: 03  
Date: 19.6.25

## Appendix 5 - Ground nesting bird strategy during the construction phase

Due to the size of this site, there is potential for ground, reed and scrub (hedgerow) nesting birds to establish within the site before and during the construction phase. Activities associated with the construction phase that could impact these birds in a way that could be considered an offence under relevant wildlife legislation include hedgerow removal/management, installation of solar panels and associated infrastructure (including the cable route), and HDD operations.

The following method statement will be adopted for works during the bird nesting season (March to August inclusive):

1. Prior to the start of works a nesting bird toolbox talk will be provided to all site staff involved in ground works by a responsible person. Staff will be made aware of the law in relation to nesting birds and their potential to be present at this site.
2. Within 5 days prior to removal of vegetation with potential for nesting birds, a nesting bird survey will be completed of affected areas by the ECoW. This will include observations for nesting activity (such the transport of nesting materials or food items) and a search for active nests.
3. Once the ecologist is certain that nesting birds are not present, that section of vegetation will be removed.
4. If evidence of nesting birds is found, the nest site will be protected by barrier tape to a buffer of at least 5 metres, and a sign indicating its function will be placed. A record will be kept of all nests encountered.
5. This protection will remain in place until and nested chicks have fledged, after which it will be removed, and the vegetation cut.

## Appendix 6 Ditch management plan

This plan is in response to comments received from Natural Resources Wales (NRW) on 08/01/2021 which stated:

Habitat management:

- A comprehensive ditch management program during the lifetime of the project, to include details of the channel and bankside ditch management to enhance the site to meet favourable condition status. The plan must achieve a large proportion of well connected *ditches that are open to sunlight to support the SSSI's aquatic flora* and fauna features.
- Details on management of reed and ditch buffers as enhancement for the SSSI Shrill carder bee features and wider biodiversity.
- 

A larger mitigation area to provide

enhancement for the Shrill carder bee.

And:

Habitat management for a large scheme such as this, within a designated site, should deliver a comprehensive management program to safeguard and enhance the features of the SSSI. The habitat management should work towards achieving favourable condition of this specific area of the SSSI.

And:

To be in favourable condition each field block unit (group of ditches within a land block) must have: No more than 50% of ditches to be category 2, 2d, 3 or 4c.

And:

Ditches in favourable condition are categorised as:

- 1 - Ditch open on one side and hedged on other side (single hedged)
- 4a - Intermittent hedge (gappy hedge) on one or both sides of ditch
- 4b - Ditch has water in it (at least 5cm deep) and no hedge on either side (ditch is open)

Ditches in unfavourable condition are categorised as:

- 2 - ditch hedged on both sides (double hedged)
- 2d - ditch hedged on both sides (double hedged) and dry
- 3 - Ditch is dry and has no hedge on either side (is open)
- 4c - hedge on one side of ditch and intermittent hedge (gappy hedge) on other side

The aim of this report was to provide a comprehensive ditch management program for the lifetime of the project to ensure at least 50% of ditches within field blocks 4 and 25 are in favourable condition i.e. not categorised as double hedged, dry or hedged to one side and partially hedged to the other.

A response to this new application was received from NRW in 2025, as follows:

As you are aware, the updated ES and associated documents (such as the LEMP) have carried over the previous proposed ditch management mitigation measures. In short, the ditch management mitigation proposal is that 50% of ditches on site will be

managed over 7 years, and then on rotation afterwards. The proposed development lies within two larger SSSI field blocks (4 and 25) that are categorised as unfavourable, because there are too many with double hedged ditches (see the LEMP, Table 3, item ID T3.3). At the time of the previous determination of this application, we were satisfied with the ditch management mitigation.

However, since then, our approach to ditch management as mitigation for new development on the Gwent Levels has developed in response to the PPW Chapter 6 update (Edition 12, October 2023). We acknowledge the majority of the ditches on the development site are in sub-optimal condition. However, it is the SSSI landowners that have a legal duty to manage their land (i.e. those ditches) so as not to cause damage to SSSI features. Therefore, it is reasonable to expect that if planning permission is granted, it should secure ongoing management and restoration of these ditches, leading to an improvement of their condition.

Therefore, our advice is that there should be a commitment from the applicant to *increase ditch management, covering the majority of the site's ditches (not only 50%)*. This increase would help maintain biodiversity on site and increase the resilience of the SSSI. This additional management can be secured, and the details finalised, through the final LEMP (as a pre-commencement condition on any permission granted).

The aim of this report is now to provide a comprehensive ditch management program for the lifetime of the project to target 100% of ditches within field blocks 4 and 25 to be in favourable condition i.e. not categorised as double hedged, dry or hedged to one side and partially hedged to the other.

#### Field survey

A site walkover to classify ditches was completed in April 2019, and updated in June and September 2021, and June 2025. During the survey, digital images were collected for each ditch, and they were categorised based on % shading and evidence of drying.

For shading classification, a ditch was classified as 50% shaded if a hedgerow was present to one side, and 100% shaded if the ditch was double hedged.

#### Results

A total of 61 ditches with a combined length of 14,540m were classified (Map 5). No underdrainage is included in this survey.

#### Field Block 4

Field Block 4 contains 39 ditches with a combined length of 9343m. Of these, only 2113m are considered in favourable condition. The remainder were in unfavourable condition due to drying, double hedgerows, and hedgerow to one side and partial hedgerow to the other (Table 1).

Table 1. Category of ditches within Field block 4

Category	Number of ditches	Length (m)
1 - Ditch open on one side and hedged on other side	10	2113
2 - ditch hedged on both sides (double hedged)	27	6734
2d - ditch hedged on both sides (double hedged) and dry	1	221
4c - hedge on one side of ditch and intermittent hedge (gappy hedge) on other side	1	275

### Field Block 25

Field Block 25 contains 22 ditches with a combined length of 5195m. None are considered in favourable condition due to drying, double hedgerows, and hedgerow to one side and partial hedgerow to the other (Table 2).

Table 2. Category of ditches within Field block 25

Category	Number of ditches	Length (m)
1 - Ditch open on one side and hedged on other side	0	0
2 - ditch hedged on both sides (double hedged)	14	3210
2d - ditch hedged on both sides (double hedged) and dry	6	1563
4c - hedge on one side of ditch and intermittent hedge (gappy hedge) on other side	2	422



## Management program

### Management target

The target is to remove scrub and cast ditches to attain favourable condition for all ditches within field compartments 4 and 25 within 7 years of development. This will be followed by a 7-year rolling program of management to ensure these ditches remain in favourable condition during the 35 year operation of this development.

Management will only be possible on ditches within the lease area. In Field block 4 this will comprise an additional 7230m of ditches improved to Category 1, and 5195m improved within Field block 25.

Ditch management will be completed along approximately 12425m of ditches in the category 2, 2d and 4c over the 7-year cycle (Table 2 and Map 2).

In addition, 2113m of ditches in Category 1 (favourable condition) in Field Block 4 will be managed to retain this favourable condition status. These will link into reens IDD39 and IDD43 to maintain flows, connectivity of favourable habitat and increase likelihood of ditches holding water throughout year to support the aquatic flora and fauna features.

There are two main elements to management, the removal of shading scrub and casting of ditches.

### Scrub removal unfavourable condition ditches in lease area

Scrub removal will adopt the following methodology:

- Scrub removal will be undertaken during the period 1 September to 28<sup>th</sup> February to avoid the accepted bird nesting season.
- Scrub will be removed from the southern/eastern side of the ditch using hand-tool and arisings will be removed from site.
- To prevent re-growth, cut stems will be treated with a suitable eco-plug, fitted as per the manufacturers recommendation.
- Scrub removal will take into account the presence of other protected species, including great crested newt, (associated with the reens adjacent to ditch 33). To allow this, scrub will be cut back to 30cm proud of the ground during the winter months, with stems cut back to ground level and treated with eco plugs during the following May/June. More detail is provided in within the relevant sections of the LEMP.

### Ditch casting unfavourable and favourable condition ditches

All ditches subject to scrub removal will require casting, along with ditches that are currently Category 1 and detailed on Map 2.

With the exception of ditches in the east of the site, ditches will be cast in late Autumn due to the likely presence of Water Vole.

Ditches 12, 13, 14, 27, 28, 29, 30, 31, 32, 33, 44, L & M in the east will be cast in the period November to January inclusive, due to the presence of great crested newt in this area.

Ditches 22, 23, 25, 26, N, O, P, Q, R, S T, U, W and AA would be cast In October to avoid disturbance in the wintering Lapwing area when these birds are most likely to be present.

Table 3. Schedule of initial ditch management in Years 1 to 7

Field Block	Type	Ditch code	Category	Initial casting	Initial scrub removal	Length (m)
4	Unfavourable	15	2d	Y1	Y1	222
4	Unfavourable	16	2	Y1	Y1	227
4	Unfavourable	17	2	Y1	Y1	272
4	Unfavourable	18	2	Y1	Y1	253
4	Unfavourable	20	2	Y1	Y1	208
4	Unfavourable	45	2	Y1	Y1	207
25	Unfavourable	8	2	Y1	Y1	190
25	Unfavourable	9	2d	Y1	Y1	260
25	Unfavourable	B	2	Y1	Y1	233
25	Unfavourable	C	2	Y1	Y1	234
4	Unfavourable	12	2	Y1 (Winter)	Y1 (Winter)	339
4	Unfavourable	13	2	Y1 (Winter)	Y1 (Winter)	202
25	Unfavourable	44	2	Y1 (Winter)	Y1 (Winter)	211
4	Unfavourable	19	4c	Y3	Y3	276
4	Unfavourable	24	2	Y3	Y3	337
25	Unfavourable	4	2	Y3	Y3	265
25	Unfavourable	5	2	Y3	Y3	330
25	Unfavourable	6	2	Y3	Y3	329
25	Unfavourable	7	2	Y3	Y3	103
25	Unfavourable	G	2d	Y3	Y3	273
4	Unfavourable	23	2	Y3 (October)	Y3 (October)	206
4	Unfavourable	25	2	Y3 (October)	Y3 (October)	223
4	Unfavourable	26	2	Y3 (October)	Y3 (October)	174
4	Unfavourable	O	2	Y3 (October)	Y3 (October)	366
4	Unfavourable	P	2	Y3 (October)	Y3 (October)	258
4	Unfavourable	Q	2	Y3 (October)	Y3 (October)	276
4	Unfavourable	W	2	Y3 (October)	Y3 (October)	245
4	Favourable	21	1	Y5	NA	114
4	Favourable	V	1	Y5	NA	229
4	Unfavourable	X	2	Y5	NA	180
4	Unfavourable	Y	2	Y5	NA	325
25	Unfavourable	2	4c	Y5	Y5	293
25	Unfavourable	3	2	Y5	Y5	200

25	Unfavourable	43	4c	Y5	Y5	129
25	Unfavourable	A	2	Y5	Y5	218
25	Unfavourable	K	2	Y5	Y5	373
4	Favourable	22	1	Y5 (October)	NA	170
4	Unfavourable	AA	2	Y5 (October)	NA	257
4	Unfavourable	N	2	Y5 (October)	NA	269
4	Favourable	R	1	Y5 (October)	NA	193
4	Unfavourable	S	2	Y5 (October)	Y5 (October)	161
4	Unfavourable	T	2	Y5 (October)	Y5 (October)	163
4	Favourable	U	1	Y5 (October)	NA	141
25	Unfavourable	10	2	Y7	Y7	206
25	Unfavourable	E	2d	Y7	Y7	252
25	Unfavourable	F	2d	Y7	Y7	254
25	Unfavourable	H	2	Y7	Y7	73
25	Unfavourable	I	2d	Y7	NA	394
25	Unfavourable	J	2d	Y7	Y7	130
4	Unfavourable	14	2	Y7 (Winter)	Y7 (Winter)	341
4	Favourable	27	1	Y7 (Winter)	NA	375
4	Favourable	28	1	Y7 (Winter)	NA	176
4	Unfavourable	29	2	Y7 (Winter)	Y7 (Winter)	271
4	Favourable	30	1	Y7 (Winter)	NA	299
4	Unfavourable	31	2	Y7 (Winter)	Y7 (Winter)	363
4	Unfavourable	32	2	Y7 (Winter)	Y7 (Winter)	377
4	Favourable	33	1	Y7 (Winter)	NA	216
4	Unfavourable	L	2	Y7 (Winter)	NA	117
4	Favourable	M	1	Y7 (Winter)	NA	200

#### Monitoring and long-term management

Ditches detailed in Table 3 and Map 2 will be cast for the life of the project on a rolling 7-year schedule detailed in Table 4.

Monitoring will be completed on all managed ditches during each management visit (Table 5) by a suitably qualified and experienced ecologist and will:

- evaluate the impact of management
- on biodiversity within the site, assess the need for additional management practices,
- assess the need for changes in management frequency, provide recommendation for
- ongoing management, report outcomes to NRW and the planning authority.

- In addition to the above, woody scrub regrowth will also be assessed annually and will be managed by cutting and Eco plugs if above 0.5m high.

Table 4. Rolling 7-year schedule of ditch management

Field Block	Ditch code	Current Category	Length (m)	Program of managed ditch monitoring
4	15	2d	222	Yr1, Yr8, Yr15, Yr22, Yr29 (autumn)
4	16	2	227	Yr1, Yr8, Yr15, Yr22, Yr29 (autumn)
4	17	2	272	Yr1, Yr8, Yr15, Yr22, Yr29 (autumn)
4	18	2	253	Yr1, Yr8, Yr15, Yr22, Yr29 (autumn)
4	20	2	208	Yr1, Yr8, Yr15, Yr22, Yr29 (autumn)
4	45	2	207	Yr1, Yr8, Yr15, Yr22, Yr29 (autumn)

25	8	2	190	Yr1, Yr8, Yr15, Yr22, Yr29 (autumn)
25	9	2d	260	Yr1, Yr8, Yr15, Yr22, Yr29 (autumn)
25	B	2	233	Yr1, Yr8, Yr15, Yr22, Yr29 (autumn)
25	C	2	234	Yr1, Yr8, Yr15, Yr22, Yr29 (autumn)
4	12	2	339	Yr1, Yr8, Yr15, Yr22, Yr29 (winter)
4	13	2	202	Yr1, Yr8, Yr15, Yr22, Yr29 (winter)
25	44	2	211	Yr1, Yr8, Yr15, Yr22, Yr29 (winter)
4	19	4c	276	Yr3, Yr10, Yr18, Yr24, Yr31 (autumn)
4	24	2	337	Yr3, Yr10, Yr18, Yr24, Yr31 (autumn)
25	4	2	265	Yr3, Yr10, Yr18, Yr24, Yr31 (autumn)
25	5	2	330	Yr3, Yr10, Yr18, Yr24, Yr31 (autumn)
25	6	2	329	Yr3, Yr10, Yr18, Yr24, Yr31 (autumn)
25	7	2	103	Yr3, Yr10, Yr18, Yr24, Yr31 (autumn)
25	G	2d	273	Yr3, Yr10, Yr18, Yr24, Yr31 (autumn)
4	23	2	206	Yr3, Yr10, Yr18, Yr24, Yr31 (October)
4	25	2	223	Yr3, Yr10, Yr18, Yr24, Yr31 (October)
4	26	2	174	Yr3, Yr10, Yr18, Yr24, Yr31 (October)
4	O	2	366	Yr3, Yr10, Yr18, Yr24, Yr31 (October)
4	P	2	258	Yr3, Yr10, Yr18, Yr24, Yr31 (October)
4	Q	2	276	Yr3, Yr10, Yr18, Yr24, Yr31 (October)
4	W	2	245	Yr3, Yr10, Yr18, Yr24, Yr31 (October)
4	21	1	114	Yr5, Yr12, Yr20, Yr26, Yr33 (autumn)
4	V	1	229	Yr5, Yr12, Yr20, Yr26, Yr33 (autumn)
4	X	2	180	Yr5, Yr12, Yr20, Yr26, Yr33 (autumn)
4	Y	2	325	Yr5, Yr12, Yr20, Yr26, Yr33 (autumn)
25	2	4c	293	Yr5, Yr12, Yr20, Yr26, Yr33 (autumn)
25	3	2	200	Yr5, Yr12, Yr20, Yr26, Yr33 (autumn)
25	43	4c	129	Yr5, Yr12, Yr20, Yr26, Yr33 (autumn)
25	A	2	218	Yr5, Yr12, Yr20, Yr26, Yr33 (autumn)
25	K	2	373	Yr5, Yr12, Yr20, Yr26, Yr33 (autumn)

4	22	1	170	Yr5, Yr12, Yr20, Yr26, Yr33 (October)
4	AA	2	257	Yr5, Yr12, Yr20, Yr26, Yr33 (October)
4	N	2	269	Yr5, Yr12, Yr20, Yr26, Yr33 (October)
4	R	1	193	Yr5, Yr12, Yr20, Yr26, Yr33 (October)
4	S	2	161	Yr5, Yr12, Yr20, Yr26, Yr33 (October)
4	T	2	163	Yr5, Yr12, Yr20, Yr26, Yr33 (October)
4	U	1	141	Yr5, Yr12, Yr20, Yr26, Yr33 (October)
25	10	2	206	Yr7, Yr14, Yr22, Yr34, Yr42 (autumn)
25	E	2d	252	Yr7, Yr14, Yr22, Yr34, Yr42 (autumn)
25	F	2d	254	Yr7, Yr14, Yr22, Yr34, Yr42 (autumn)
25	H	2	73	Yr7, Yr14, Yr22, Yr34, Yr42 (autumn)
25	I	2d	394	Yr7, Yr14, Yr22, Yr34, Yr42 (autumn)
25	J	2d	130	Yr7, Yr14, Yr22, Yr34, Yr42 (autumn)
4	14	2	341	Yr7, Yr14, Yr22, Yr34, Yr42 (winter)
4	27	1	375	Yr7, Yr14, Yr22, Yr34, Yr42 (winter)
4	28	1	176	Yr7, Yr14, Yr22, Yr34, Yr42 (winter)
4	29	2	271	Yr7, Yr14, Yr22, Yr34, Yr42 (winter)
4	30	1	299	Yr7, Yr14, Yr22, Yr34, Yr42 (winter)
4	31	2	363	Yr7, Yr14, Yr22, Yr34, Yr42 (winter)
4	32	2	377	Yr7, Yr14, Yr22, Yr34, Yr42 (winter)
4	33	1	216	Yr7, Yr14, Yr22, Yr34, Yr42 (winter)
4	L	2	117	Yr7, Yr14, Yr22, Yr34, Yr42 (winter)
4	M	1	200	Yr7, Yr14, Yr22, Yr34, Yr42 (winter)

Table 5. Monitoring schedule (excluding woody scrub re-growth which will be assessed annually)

Ditch number	Program of managed ditch monitoring
All ditches	Yr1, Yr3, Yr5, Yr7, Yr8, Yr10, Yr12, Yr14, Yr15, Yr18, Yr22, Yr26, Yr26, Yr29, Yr31, Yr33 & Yr34

Should the management not meet the target with 100% of ditches open to sunlight on southernmost bank and holding water, then this will trigger liaison with NRW to plan further management.

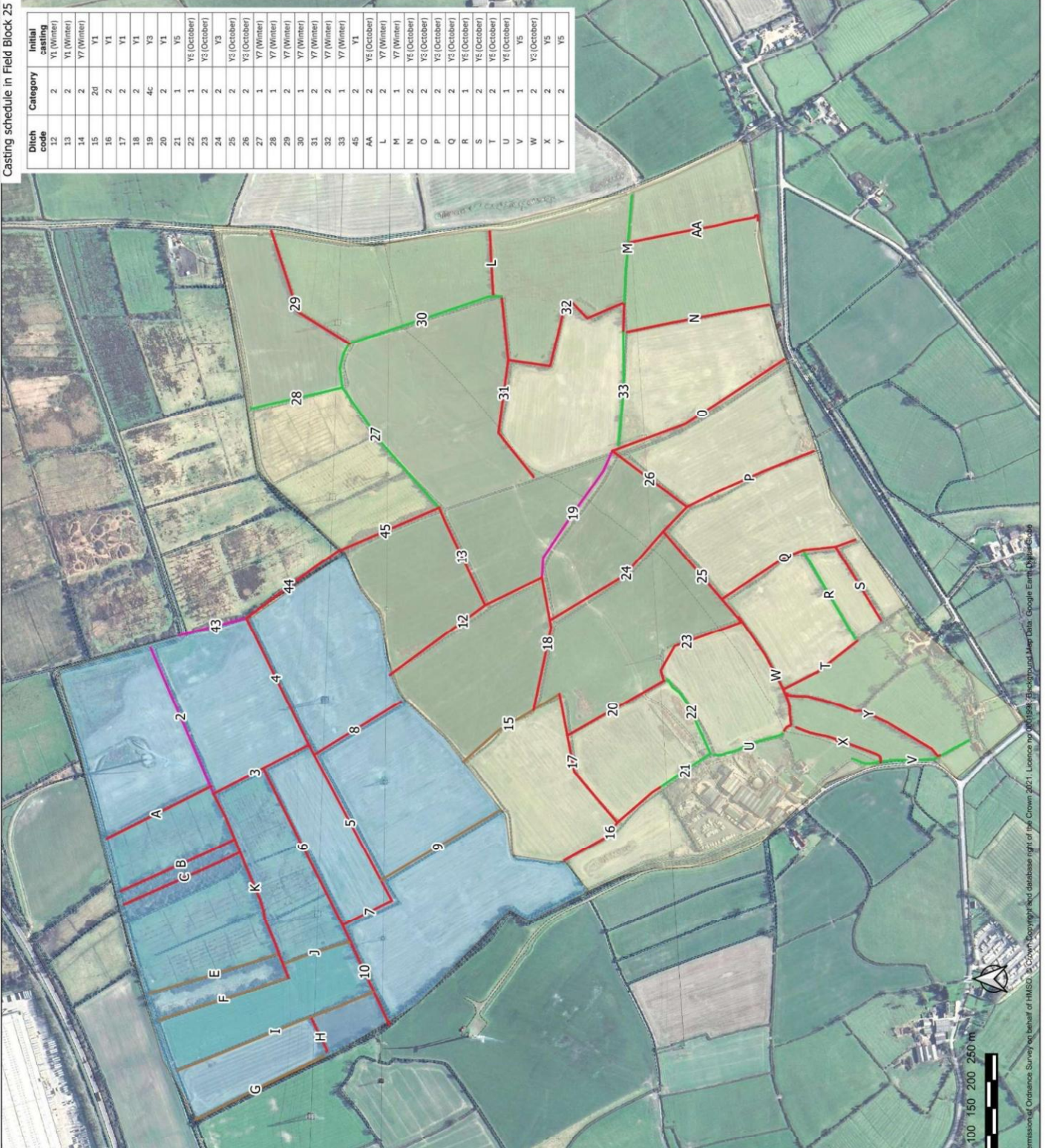
- Legend**  
Field blocks  
25  
4  
Ditch category  
1 (favourable)  
2 (unfavourable)  
2d (unfavourable)  
4c (unfavourable)

Casting schedule in Field Block 4

Ditch code	Category	Initial casting
2	4c	Y5
3	2	Y5
4	2	Y3
5	2	Y3
6	2	Y3
7	2	Y3
8	2	Y1
9	2d	Y1
10	2	Y7
43	4c	Y5
44	2	Y1 (Winter)
A	2	Y5
B	2	Y1
C	2	Y1
E	2d	Y7
F	2d	Y7
G	2d	Y3
H	2	Y7
I	2d	Y7
J	2d	Y7
K	2	Y5

Casting schedule in Field Block 25

Ditch code	Category	Initial casting
12	2	Y1 (Winter)
13	2	Y1 (Winter)
14	2	Y7 (Winter)
15	2d	Y1
16	2	Y1
17	2	Y1
18	2	Y1
19	4c	Y3
20	2	Y1
21	1	Y5
22	1	Y5 (October)
23	2	Y5 (October)
24	2	Y3
25	2	Y5 (October)
26	2	Y5 (October)
27	1	Y7 (Winter)
28	1	Y7 (Winter)
29	2	Y7 (Winter)
30	1	Y7 (Winter)
31	2	Y7 (Winter)
32	2	Y7 (Winter)
33	1	Y7 (Winter)
45	2	Y1
AA	2	Y5 (October)
L	2	Y7 (Winter)
M	1	Y7 (Winter)
N	2	Y5 (October)
O	2	Y5 (October)
P	2	Y5 (October)
Q	2	Y5 (October)
R	1	Y5 (October)
S	2	Y5 (October)
T	2	Y5 (October)
U	1	Y5 (October)
V	1	Y5
W	2	Y5 (October)
X	2	Y5
Y	2	Y5



Title: Map 6. Ditch management plan

Project: Rush Wall Solar Park

Checked by: CDH Version: 05  
Date: 04/02/2025

## Appendix 7 - Assessment of net gain.

### Defra Biodiversity Metric 3.0

In the absence of other tools specific to Wales, Defra Biodiversity Metric 3.0 has been applied to habitat areas and watercourses at this site to provide a quantitative assessment of biodiversity net gain. This has not been applied to hedgerow habitat.

Taking the following into account, a predicted net gain of 144 habitat units is likely, representing a 75% increase over site baseline:

- habitat losses associated with built infrastructure and associated access tracks,
- improvement of habitat quality associated with under panel grassland habitats,
- improved grassland habitat quality associated with reed and ditch buffers, improvement
- in areas where arable has been planted to grassland.

In addition, taking the following into account, a predicted net gain of 19.9 River units is likely, representing a 18% increase over site baseline • improvement in ditch habitat quality due to changes in land management and active scrub removal to open up ditch habitat.

The detailed results page from the metric is provided below.

**Summary Figures**

Net project biodiversity units (including all on-site and off-site habitat compensation)	144.33
Baseline biodiversity units	139.85
<b>Total project biodiversity % change</b> (including all on-site and off-site habitat compensation)	<b>3.24%</b>
Baseline biodiversity units	139.85
Net project biodiversity units	144.33

**Combined habitat retention and enhancement**

Habitat type	Baseline	Proposed	Net Change
Area 1	100	100	0
Area 2	100	100	0
Area 3	100	100	0
Area 4	100	100	0
Area 5	100	100	0
Area 6	100	100	0
Area 7	100	100	0
Area 8	100	100	0
Area 9	100	100	0
Area 10	100	100	0
Area 11	100	100	0
Area 12	100	100	0
Area 13	100	100	0
Area 14	100	100	0
Area 15	100	100	0
Area 16	100	100	0
Area 17	100	100	0
Area 18	100	100	0
Area 19	100	100	0
Area 20	100	100	0
Area 21	100	100	0
Area 22	100	100	0
Area 23	100	100	0
Area 24	100	100	0
Area 25	100	100	0
Area 26	100	100	0
Area 27	100	100	0
Area 28	100	100	0
Area 29	100	100	0
Area 30	100	100	0
Area 31	100	100	0
Area 32	100	100	0
Area 33	100	100	0
Area 34	100	100	0
Area 35	100	100	0
Area 36	100	100	0
Area 37	100	100	0
Area 38	100	100	0
Area 39	100	100	0
Area 40	100	100	0
Area 41	100	100	0
Area 42	100	100	0
Area 43	100	100	0
Area 44	100	100	0
Area 45	100	100	0
Area 46	100	100	0
Area 47	100	100	0
Area 48	100	100	0
Area 49	100	100	0
Area 50	100	100	0

**Area habitats**

**On-site change by broad habitat type**

Habitat group	Baseline	For development on site	On-site Change
Grassland	100	100	0
Woodland	100	100	0
Wetland	100	100	0
Watercourse	100	100	0
Open water	100	100	0
Other	100	100	0

**Off-site change by broad habitat type**

Habitat group	Baseline	For development off-site	Off-site Change
Grassland	100	100	0
Woodland	100	100	0
Wetland	100	100	0
Watercourse	100	100	0
Open water	100	100	0
Other	100	100	0

**Combined on-site and off-site change by broad habitat type**

Habitat group	Baseline	For development on site	For development off-site	Combined Change
Grassland	100	100	100	200
Woodland	100	100	100	200
Wetland	100	100	100	200
Watercourse	100	100	100	200
Open water	100	100	100	200
Other	100	100	100	200

**Combined area lost by disturbance level**

Category	Area lost (hectares)	Area lost (%)
High	10	10%
Medium	20	20%
Low	30	30%
Very Low	40	40%

**% Area lost by disturbance category**

**On-site and off-site habitat retention by category area (hectares)**

**On-site and off-site habitat retention by category biodiversity units**

**On-site change by habitat group**

**On-site and off-site change by habitat group**

**Combined Biodiversity unit change**

**Combined habitat area change**

**Hedges and lines of trees**

**On-site change by hedgerow type**

Hedgerow type	Baseline	For development on site	On-site Change
Grass	100	100	0
Wood	100	100	0
Other	100	100	0

**Off-site change by hedgerow type**

Hedgerow type	Baseline	For development off-site	Off-site Change
Grass	100	100	0
Wood	100	100	0
Other	100	100	0

**Combined on-site and off-site change by hedgerow type**

Hedgerow type	Baseline	For development on site	For development off-site	Combined Change
Grass	100	100	100	200
Wood	100	100	100	200
Other	100	100	100	200

**Combined length lost by disturbance level**

Category	Length lost (m)	Length lost (%)
High	10	10%
Medium	20	20%
Low	30	30%
Very Low	40	40%

**% Length lost by disturbance category**

**On-site and off-site hedge retention by category length (m)**

**On-site and off-site hedge retention by category biodiversity units**

**Change in hedgerow type (hedgerow units)**

**On-site length change by hedgerow length (m)**

**Combined Biodiversity unit change**

**Combined hedgerow length change (m)**

**Rivers and Streams**

**On-site change by river type**

River type	Baseline	For development on site	On-site Change
Grass	100	100	0
Wood	100	100	0
Other	100	100	0

**Off-site change by river type**

River type	Baseline	For development off-site	Off-site Change
Grass	100	100	0
Wood	100	100	0
Other	100	100	0

**Combined on-site and off-site change by river type**

River type	Baseline	For development on site	For development off-site	Combined Change
Grass	100	100	100	200
Wood	100	100	100	200
Other	100	100	100	200

**Combined length lost by disturbance level**

Category	Length lost (m)	Length lost (%)
High	10	10%
Medium	20	20%
Low	30	30%
Very Low	40	40%

**% Length lost by disturbance category**

**River length retained, grouped for enhancement or lost (length m)**

**River retention category (Biodiversity units)**

**Length change by river type**

**Length change by river type**

**Combined Biodiversity unit change**

**Combined river length change**

## SPIES tool

The SPIES tool<sup>4</sup> assesses proposed management interventions against peer reviewed scientific papers and provides an evidence-based summary of likely impacts. For this project, interventions proposed within the LEMP will result in changes significantly weighted towards enhancement for the following:

- Maintaining habitats and biodiversity
- Pollination regulation
- Water quality regulation
- Climate regulation
- Flood regulation
- Water cycle support

The assessment was as follows;

---

<sup>4</sup> <https://www.lancaster.ac.uk/spies/>

# Solar Park Impacts on Ecosystem Services (SPIES)

## SUMMARY REPORT - MANAGEMENT ACTIONS

<https://www.lancaster.ac.uk/spies/>



Simomics



### Introduction

The solar park impacts on ecosystem services (SPIES) decision support tool provides an accessible, evidence-based assessment of the impacts of solar park management on biodiversity, natural capital and ecosystem services for the UK solar industry. The SPIES tool was co-developed by Lancaster University, the University of York and a broad cross-sectoral stakeholder group, including the National Solar Centre, the Solar Trade Association, the National Farmers Union, and those involved in solar park development, operation and maintenance, nature conservation bodies, land owners, and the farming community.

The SPIES tool was converted into a web-based app by Simomics and the project funded by the Natural Environment Research Council.

This document provides an overview of the evidence from peer-reviewed scientific literature on the effect of current and proposed management action strategies on ecosystem services. It provides a:

1. List of the current and proposed management actions.
2. Visual summary of the evidence, providing an overview of the quantity of evidence, the magnitude and direction of the effect.

## 1 List of the Current and Proposed Management Actions

The user-selected current and proposed management actions are:

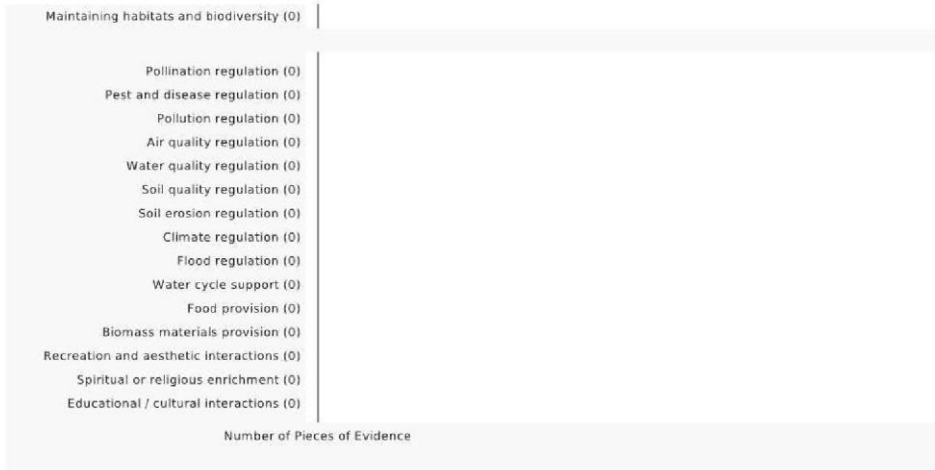
Category	Current	Proposed
Grazing		Reduce grazing intensity if previously grazed Replace mowing with grazing if previously mowed
Drainage		Install/maintain subsurface drains
Habitats		Create/maintain buffer zones/field margins/set-aside Install/maintain bat boxes Install/maintain bird boxes
Pollution & Chemical Inputs		Reduce pollution and green waste inputs into ditches Reduce/cease pesticide and fertiliser use if previously used
Vegetation		Transfer hay/diaspores to soil
Trees & Hedges		Cut hedges in winter
Mowing		Mow later in the year Reduce mowing regime to once a year

---

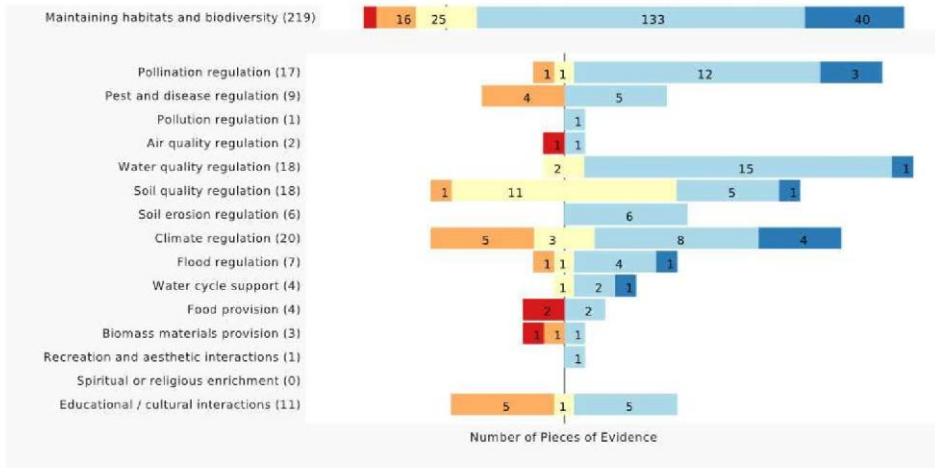
## 2 Evidence Summary



### Impact from current actions:



### Impact from proposed actions:



Appendix 8 – Soil sampling results.



**western**  
ECOLOGY

1 Geffery Close  
Landrake  
Saltash  
Cornwall  
PL12 5HA  
Tel: 0800 622 6828  
email: office@westernecology.co.uk

**Legend**  
Phosphorus levels mg/l

- 45 - 56.6
- 56.6 - 74.8
- 74.8 - 85.8
- 85.8 - 93.4
- 93.4 - 129

Development footprint  
Site

Title: Map 7. Soil sampling phosphorous levels

Project: Rush Wall Solar Park

Checked by: CDH Version: 01  
Date: 20.11.25



### Analytical Report

Date received: 06/11/25  
Date reported: 18/11/25

### Results

1	2517726		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	84	5	Potential risk to the environment. A clear rotational P management plan is needed to sustainably run-down the soil reserve without compromising productivity.
Potassium (mg/l)	400	3	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	465	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	6.96		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	7.35		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.449		
Total Organic Carbon (%)	4.27		
C:N Ratio	9.5		Carbon supply limiting

Continue Rotational Monitoring    
 Review    
 Investigate    
 Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25

Date reported: 18/11/25

### Results

2	2517727		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	87	5	Potential risk to the environment. A clear rotational P management plan is needed to sustainably run-down the soil reserve without compromising productivity.
Potassium (mg/l)	367	3	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	366	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	7.10		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	6.28		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.409		
Total Organic Carbon (%)	3.65		
C:N Ratio	8.9		Carbon supply limiting



Continue Rotational Monitoring



Review

Investigate



Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25  
Date reported: 18/11/25

### Results

3	2517728		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	126	6	Potential risk to the environment. A clear rotational P management plan is needed to sustainably run-down the soil reserve without compromising productivity.
Potassium (mg/l)	429	4	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	277	5	CONTINUE ROTATIONAL MONITORING. A clear rotational Mg management plan will allow the soil reserve to be maintained without compromising productivity.
pH	7.67		Potential nutrient interaction issues. Monitor crops for trace element deficiencies; foliar feeds will be more effective than soil applications in high pH soils.
Organic Matter (%)	7.04		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.449		
Total Organic Carbon (%)	4.09		
C:N Ratio	9.1		Carbon supply limiting

Continue Rotational Monitoring
  Review
  Investigate
  Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25

Date reported: 18/11/25

### Results

4	2517729		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	84	5	Potential risk to the environment. A clear rotational P management plan is needed to sustainably run-down the soil reserve without compromising productivity.
Potassium (mg/l)	294	3	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	322	5	CONTINUE ROTATIONAL MONITORING. A clear rotational Mg management plan will allow the soil reserve to be maintained without compromising productivity.
pH	7.34		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	5.45		Lower than average for the climate/soil type; may be associated with intensive cropping rotations with few organic matter inputs. Consider whether crop residues can be returned and what sources of organic materials can be accessed.
Total N (%)	0.341		
Total Organic Carbon (%)	3.17		
C:N Ratio	9.3		Carbon supply limiting



Continue Rotational Monitoring



Review



Investigate



Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25  
Date reported: 18/11/25

### Results

5	2517730		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	46	4	A clear rotational P management plan is needed to sustainably maintain the soil reserve whilst reducing the environmental risk.
Potassium (mg/l)	351	3	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	403	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	6.87		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	5.28		Lower than average for the climate/soil type; may be associated with intensive cropping rotations with few organic matter inputs. Consider whether crop residues can be returned and what sources of organic materials can be accessed.
Total N (%)	0.326		
Total Organic Carbon (%)	3.07		
C:N Ratio	9.4		Carbon supply limiting

Continue Rotational Monitoring    
 Review    
 Investigate    
 Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25

Date reported: 18/11/25

### Results

6	2517731		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	45	3	CONTINUE ROTATIONAL MONITORING. A clear rotational P management plan is needed to maintain the soil reserve without compromising productivity or increasing environmental risk.
Potassium (mg/l)	278	3	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	435	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	6.71		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	5.86		Lower than average for the climate/soil type; may be associated with intensive cropping rotations with few organic matter inputs. Consider whether crop residues can be returned and what sources of organic materials can be accessed.
Total N (%)	0.374		
Total Organic Carbon (%)	3.41		
C:N Ratio	9.1		Carbon supply limiting

Continue Rotational Monitoring
  Review
  Investigate
  Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25

Date reported: 18/11/25

### Results

7	2517732		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	64	4	A clear rotational P management plan is needed to sustainably maintain the soil reserve whilst reducing the environmental risk.
Potassium (mg/l)	280	3	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	227	4	CONTINUE ROTATIONAL MONITORING. A clear rotational Mg management plan will allow the soil reserve to be maintained without compromising productivity.
pH	7.81		Potential nutrient interaction issues. Monitor crops for trace element deficiencies; foliar feeds will be more effective than soil applications in high pH soils.
Organic Matter (%)	6.13		Lower than average for the climate/soil type; may be associated with intensive cropping rotations with few organic matter inputs. Consider whether crop residues can be returned and what sources of organic materials can be accessed.
Total N (%)	0.360		
Total Organic Carbon (%)	3.56		
C:N Ratio	9.9		Carbon supply limiting



Continue Rotational Monitoring



Review



Investigate



Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25  
Date reported: 18/11/25

### Results

8	2517733		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	63	4	A clear rotational P management plan is needed to sustainably maintain the soil reserve whilst reducing the environmental risk.
Potassium (mg/l)	334	3	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	469	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	6.65		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	7.51		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.445		
Total Organic Carbon (%)	4.37		
C:N Ratio	9.8		Carbon supply limiting

Continue Rotational Monitoring
  Review
  Investigate
  Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25  
Date reported: 18/11/25

### Results

9	2517734		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	52	4	A clear rotational P management plan is needed to sustainably maintain the soil reserve whilst reducing the environmental risk.
Potassium (mg/l)	298	3	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	435	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	6.42		Ensure there is a robust liming plan in place on non-calcareous soils to maintain pH.
Organic Matter (%)	6.89		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.435		
Total Organic Carbon (%)	4.01		
C:N Ratio	9.2		Carbon supply limiting

Continue Rotational Monitoring    
 Review    
 Investigate    
 Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25  
Date reported: 18/11/25

### Results

10	2517735		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	50	4	A clear rotational P management plan is needed to sustainably maintain the soil reserve whilst reducing the environmental risk. CONTINUE ROTATIONAL MONITORING.
Potassium (mg/l)	295	3	A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	511	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	6.50		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	7.59		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.461		
Total Organic Carbon (%)	4.41		
C:N Ratio	9.6		Carbon supply limiting

Continue Rotational Monitoring
  Review
  Investigate
  Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25  
Date reported: 18/11/25

### Results

11	2517736		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	80	5	Potential risk to the environment. A clear rotational P management plan is needed to sustainably run-down the soil reserve without compromising productivity.
Potassium (mg/l)	408	4	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	524	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	6.71		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	7.59		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.462		
Total Organic Carbon (%)	4.41		
C:N Ratio	9.6		Carbon supply limiting

Continue Rotational Monitoring
  Review
  Investigate
  Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25  
Date reported: 18/11/25

### Results

12	2517737		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	88	5	Potential risk to the environment. A clear rotational P management plan is needed to sustainably run-down the soil reserve without compromising productivity.
Potassium (mg/l)	457	4	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	481	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	6.98		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	7.43		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.480		
Total Organic Carbon (%)	4.32		
C:N Ratio	9.0		Carbon supply limiting



Continue Rotational Monitoring



Review



Investigate



Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25

Date reported: 18/11/25

### Results

13	2517738		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	91	5	Potential risk to the environment. A clear rotational P management plan is needed to sustainably run-down the soil reserve without compromising productivity.
Potassium (mg/l)	340	3	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	244	4	CONTINUE ROTATIONAL MONITORING. A clear rotational Mg management plan will allow the soil reserve to be maintained without compromising productivity.
pH	7.67		Potential nutrient interaction issues. Monitor crops for trace element deficiencies; foliar feeds will be more effective than soil applications in high pH soils.
Organic Matter (%)	6.53		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.386		
Total Organic Carbon (%)	3.80		
C:N Ratio	9.8		Carbon supply limiting



Continue Rotational Monitoring



Review



Investigate



Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25

Date reported: 18/11/25

### Results

14	2517739		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	69	4	A clear rotational P management plan is needed to sustainably maintain the soil reserve whilst reducing the environmental risk.
Potassium (mg/l)	308	3	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	422	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	6.95		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	7.47		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.410		
Total Organic Carbon (%)	4.34		
C:N Ratio	10.6		Satisfactory



Continue Rotational Monitoring



Review

Investigate



Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25  
Date reported: 18/11/25

### Results

15	2517740		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	112	6	Potential risk to the environment. A clear rotational P management plan is needed to sustainably run-down the soil reserve without compromising productivity.
Potassium (mg/l)	593	4	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	490	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	7.07		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	7.92		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.453		
Total Organic Carbon (%)	4.60		
C:N Ratio	10.2		Satisfactory

Continue Rotational Monitoring
  Review
  Investigate
  Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25

Date reported: 18/11/25

### Results

16	2517741		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	113	6	Potential risk to the environment. A clear rotational P management plan is needed to sustainably run-down the soil reserve without compromising productivity.
Potassium (mg/l)	475	4	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	413	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	7.18		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	7.10		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.437		
Total Organic Carbon (%)	4.13		
C:N Ratio	9.5		Carbon supply limiting



Continue Rotational Monitoring



Review

Investigate



Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25  
Date reported: 18/11/25

### Results

17	2517742		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	129	6	Potential risk to the environment. A clear rotational P management plan is needed to sustainably run-down the soil reserve without compromising productivity.
Potassium (mg/l)	546	4	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	503	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	7.14		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	7.81		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.427		
Total Organic Carbon (%)	4.54		
C:N Ratio	10.6		Satisfactory



Continue Rotational Monitoring



Review

Investigate



Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25

Date reported: 18/11/25

### Results

18	2517743		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	79	5	Potential risk to the environment. A clear rotational P management plan is needed to sustainably run-down the soil reserve without compromising productivity.
Potassium (mg/l)	399	3	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	513	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	6.84		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	6.29		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.386		
Total Organic Carbon (%)	3.66		
C:N Ratio	9.5		Carbon supply limiting

Continue Rotational Monitoring
  Review
  Investigate
  Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25  
Date reported: 18/11/25

### Results

19	2517744		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	88	5	Potential risk to the environment. A clear rotational P management plan is needed to sustainably run-down the soil reserve without compromising productivity.
Potassium (mg/l)	316	3	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	520	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	6.86		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	6.71		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.406		
Total Organic Carbon (%)	3.90		
C:N Ratio	9.6		Carbon supply limiting



Continue Rotational Monitoring



Review

Investigate



Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25

Date reported: 18/11/25

### Results

20	2517745		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	55	4	A clear rotational P management plan is needed to sustainably maintain the soil reserve whilst reducing the environmental risk.
Potassium (mg/l)	247	3	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	416	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	6.86		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	5.60		Lower than average for the climate/soil type; may be associated with intensive cropping rotations with few organic matter inputs. Consider whether crop residues can be returned and what sources of organic materials can be accessed.
Total N (%)	0.352		
Total Organic Carbon (%)	3.25		
C:N Ratio	9.2		Carbon supply limiting



Continue Rotational Monitoring



Review

Investigate

Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



### Analytical Report

Date received: 06/11/25  
Date reported: 18/11/25

### Results

21	2517746		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	94	5	Potential risk to the environment. A clear rotational P management plan is needed to sustainably run-down the soil reserve without compromising productivity.
Potassium (mg/l)	317	3	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan should reduce and sustainably maintain the soil reserve without compromising productivity. Care is particularly needed to maintain Mg where K levels are high to avoid the risks of inducing hypomagnesaemia (low Mg) under grazing.
Magnesium (mg/l)	454	6	A clear rotational Mg management plan will allow the soil reserve to be reduced, and then maintained, without compromising productivity. If liming is necessary, consider the sources of lime available and, where feasible, select a low Mg lime. High soil Mg concentrations do not damage crop growth directly, but may affect plant availability of other cations such as potassium or calcium. Carefully planned grazing and dietary supplementation may be needed in grasslands on high Mg soils. If sodium levels are also high and calcium levels are low, then high Mg levels may reduce aggregate stability in some clay soils.
pH	6.57		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	7.55		CONTINUE ROTATIONAL MONITORING. Typical for the climate/ soil type; likely to be associated with crop residue returns and other regular organic matter inputs e.g. through cover cropping or compost.
Total N (%)	0.455		
Total Organic Carbon (%)	4.39		
C:N Ratio	9.6		Carbon supply limiting



Continue Rotational Monitoring



Review



Investigate



Potential Environmental Risk

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



## Analytical Report

Date received: 06/11/25

Date reported: 18/11/25

### Results

22	2517747		
Analysis	Result	Index	Interpretation
Phosphorus (mg/l)	72	5	Potential risk to the environment. A clear rotational P management plan is needed to sustainably run-down the soil reserve without compromising productivity.
Potassium (mg/l)	225	2+	CONTINUE ROTATIONAL MONITORING. A clear rotational K management plan is needed to maintain the soil reserve without compromising productivity.
Magnesium (mg/l)	316	5	CONTINUE ROTATIONAL MONITORING. A clear rotational Mg management plan will allow the soil reserve to be maintained without compromising productivity.
pH	7.27		CONTINUE ROTATIONAL MONITORING. On non-calcareous soils, ensure that the lime rates used in the liming plan are not over-correcting. It may be better to use lower rates more often to maintain pH at 7, unless there are very sensitive crops (such as oilseed rape, sugar beet, peas) in the rotation.
Organic Matter (%)	6.03		Lower than average for the climate/soil type; may be associated with intensive cropping rotations with few organic matter inputs. Consider whether crop residues can be returned and what sources of organic materials can be accessed.
Total N (%)	0.378		
Total Organic Carbon (%)	3.51		
C:N Ratio	9.3		Carbon supply limiting

	Continue Rotational Monitoring		Review		Investigate		Potential Environmental Risk
---	--------------------------------	---	--------	---	-------------	--	------------------------------

**Please note:** The colour code above is a guidance for agricultural soils and may not be applicable to other cultivations

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).



**Hill Court Farm Research Ltd**

*Environment and Agriculture*



**Hill Court Farm Research Ltd**

*Environment and Agriculture*

---

---

Methods used

Available P: extraction in 0.5M NaHCO<sub>3</sub>, pH 8.5 for 30 min (Olsen P).

Available K and Mg: extraction in 1M NH<sub>4</sub>NO<sub>3</sub> for 30 min

pH: measurement in deionised H<sub>2</sub>O.

Total Carbon: by dry combustion (DUMAS)

Total Nitrogen: by dry combustion (DUMAS)

Inorganic Carbon: by auto-Calcis

Organic Carbon: the difference between total Carbon and inorganic Carbon.

Organic Matter: OM was calculated by multiplying Organic Carbon x 1.72

---

---

**Disclaimer:** Although we do our utmost to provide guidance to the best of our ability, Hill Court Farm Research Ltd shall not in any event be liable for any loss, damage or injury suffered directly or indirectly in relation to any of the analyses or recommendations provided.

---

Hill Court Farm Research Ltd, Hill Court Farm, Frogsmarsh, Corse Lawn, Gloucestershire, GL19 4PW, UK.  
Tel: 0300 3038088. E-mail: [info@hillcourtresearch.co.uk](mailto:info@hillcourtresearch.co.uk), website: [www.hillcourtresearch.co.uk](http://www.hillcourtresearch.co.uk).