Rosefield Solar Farm

Environmental Statement

Volume 4
Appendix 7.9: Preliminary Aquatic Survey Report (2023)

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

EN010158/APP/6.4
September 2025
Rosefield Energyfarm Limited

Foreword

Survey information contained within **ES Volume 4, Appendix 7.9: Preliminary Aquatic Survey Report (2023) [EN010158/APP/6.4]** forms part of the Environmental Statement for information only. The preliminary aquatic surveys detailed within this appendix were undertaken in June 2023 and were based on a superseded version of the Order Limits. The results detailed within this appendix were correct at the time of writing; however, this has not impacted the assessment undertaken for aquatic habitats and species, with the results of these surveys considered satisfactory to provide a sufficient baseline upon which to base the assessment. Further details are provided within **ES Volume 2, Chapter 7: Biodiversity [EN010158/APP/6.2]**.

Table of Contents

1. Introduction

1.1. Purpose of this report

1.1.1. This report presents the results of the preliminary aquatic survey undertaken by two aquatic ecologists on 27 - 29 June 2023 at the proposed Rosefield Solar Farm development (central Grid Reference SP729231), shown in **Figure 1** (**Annex A**). A total of three watercourses were assessed along with 36 ponds, 28 of which were within the proposed Site Boundary with the remaining eight ponds located within 25m of the Site Boundary.

1.1.2. The assessment of marginal and submerged features was undertaken to assess the quality and extent of viable habitat for notable aquatic species, freshwater fishes, and macroinvertebrates.

1.1.3. Surveyors also recorded features which may provide opportunities for other species, such as the protected, white-clawed crayfish (*Austropotamobius pallipes*), otter (*Lutra lutra*) and water vole (*Arvicola amphibius*). Any signs of other protected or invasive species were also noted.

1.1.4. This report details the habitat features and observations recorded by surveyors during the preliminary aquatic survey walkover. The results of the survey will be used to inform any additional survey requirements and/or possible mitigation measures which may be required as part of the Proposed Development.

1.2. Project overview

1.2.1. Rosefield Solar Farm is a proposed solar farm with energy storage which will generate and store renewable electricity for export to the National Grid. The main features of the Proposed Development consists of the following elements:

- Solar PV development consisting of:
  - Ground mounted Solar PV generating station. The generating station would include Solar PV modules and mounting structures; and
  - Balance of Solar System (BoSS) which comprises: Inverters; Transformers; Switchgear; Combiner Boxes; acoustic barriers and cabling.
- A project substation (the ‘Rosefield Substation’) compound comprising: Transformers; Switchgear; reactive power compensation bays; disconnectors; circuit breakers; busbars; control equipment; lightning surge arrestors; building(s) including office, control, functions, material storage, material laydown areas and welfare facilities; firewalls; fencing

and acoustic barriers; a security cabin; parking as well as wider monitoring, maintenance and emergency equipment;

- A Main Collector Compound and two Satellite Collector Compounds comprising: Switchgear; Transformers; ancillary equipment; operation and maintenance and welfare facilities; material storage; material laydown areas; fencing and acoustic barriers; and security cabins;
- Battery Energy Storage System (BESS) compound comprising: batteries and associated Inverters; Transformers; Switchgear, ancillary equipment and their containers; office, control and welfare buildings; fencing and acoustic barriers; monitoring, maintenance and emergency systems; air conditioning; electrical cables; fire safety infrastructure; operation (including maintenance) security facilities; material storage; and material laydown areas;
- Interconnecting Cabling Corridor(s) to connect the Solar PV modules and the BESS to the Satellite and Main Collector Compounds to the Rosefield Substation;
- A Grid Connection Cable Corridor to connect the Rosefield Substation to the National Grid East Claydon Substation via 400kV cabling;
- Ancillary infrastructure works comprising: boundary treatment; security equipment; lighting; fencing; landscaping; internal access tracks; works to facilitate vehicular access; earthing devices; earthworks; surface water management; utility connections and diversions; and any other works identified as necessary to enable the Proposed Development;
- Green and blue infrastructure, recreation and amenity works comprising: landscaping; habitat management; biodiversity enhancement; the creation of three permissive footpaths; and works to permanently divert four public right of way footpaths in five instances;
- Site-wide operational monitoring and security equipment; and
- Highways infrastructure improvements and safety works comprising: minor junction improvement works; road widening; passing places; and works to facilitate vehicular access to the Site.

2. Methods

2.1. Survey extent

2.1.1. There are four land parcels to the proposed solar farm as follows: Parcel 1 to the west, Parcel 1a to the south-west, Parcel 2 to the south-east and Parcel 3 to the north-east. An additional 25m protection buffer was applied to Parcel 1, 1a, 2 and 3 which is not included within the area (ha) (**Figure 1** (**Annex A**)).

Table 1: Summary of Parcels 1-3

Site ID	Area (ha)	NGR
Parcel 1	172.7	SP 70347 24207
Parcel 1a	14.5	SP 70926 22941
Parcel 2	134.9	SP 73098 23223
Parcel 3	20.3	SP 75422 25722

2.1.2. The aquatic walkover survey included walking the banks of all water features within the Site Boundary and its buffer. It encompassed 36 ponds and three unnamed watercourses.

2.2. Preliminary aquatic survey

2.2.1. The survey methodology was adapted from that described in Hendry & Cragg-Hine (1996[1]), by which it incorporated habitat types for all groups of fish including salmonids, European eel (*Anguilla anguilla*), lampreys, and small species such as bullhead (*Cottus gobio*) and 3-spined stickleback (*Gasterosteus aculeatus*).

2.2.2. Surveyors used an online ARCGIS map to record notes for each waterbody while in the field. Recorded habitat features included:

- flow type (e.g., glide, run, riffle, cascade, pool and rapid);
- Substrate type (e.g., boulder, cobble, pebble, gravel, sand, silt or artificial, as defined in the wentworth scale);

[1] Hendry K. & Cragg-Hine D. (1996). Fisheries Technical Manual 4, R&D: Technical Report W44, Environment Agency Publication.

- Macrophyte presence/type (e.g., emergent linear, emergent broad-leaf, submerged linear, submerged broad-leaf, floating linear, floating broadleaf, or choked channel);
- Other key features (e.g., side bar, mid-stream bar, man-made dams, weirs, large woody debris, coarse woody debris, spawning area, fry/juvenile fish refuge area); and
- Evidence of protected or invasive species (e.g., field signs or incidental observations).

2.2.3. Digital photographs were taken during the surveys to provide a record of any notable habitat features and of the general character of the surveyed waterbodies.

2.3. Constraints and limitations

2.3.1. Preceding the 27 June 2023 survey, dry and hot weather caused below normal water levels in many water features. As a result, this survey may not fully reflect the features typical water level, and the suitability of aquatic habitats for fish and other species could improve when water levels return to normal.

2.3.2. Surveyors also found the watercourse in Parcel 3 was largely inaccessible due to dense woodland scrub on the right bank and a steep, densely vegetated left bank. Inaccessible banks combined with a narrow channel (c.1m width) rendered this area unsuitable for survey.

2.3.3. No further constraints were found.

3. Results

3.1. Preliminary aquatic survey - Parcel 1

3.1.1. Parcel 1 mainly consisted of arable cropland fields bordered by hedgerows. Additionally, there were permanently vegetated pasture with evidence of rotational grazing in fields primarily to the west, along with small areas of woodland and mixed scrub. Ponds found within Parcel 1 were mostly shallow or dry and only occasionally deep. See **Figure 2** (**Annex A**) for the location Watercourses and Pond IDs at Parcel 1.

3.1.2. The shallow ponds, including Pond ID 9 and 10 were stagnant and approximately 1 - 10cm in depth with broad floating, submerged and emergent linear leaved vegetation present. Some ponds were heavily poached and comprised of a silt clay layer, with herb and tall grass/scrub present on the bank tops.

Plate 1 - Pond ID 10

3.1.3. The dry ephemeral ponds, including Pond ID 18 were densely overgrown with terrestrial vegetation including horse tail and dense scrub which caused the ponds to be completed shaded. These ponds were also bordered by woodland as well as arable and pasture fields.

Plate 2 - Pond ID 18

3.1.4. There was one long watercourse north-west of Parcel 1 and a smaller section of ditches present in the middle, and in the east of Parcel 1.

3.1.5. Most ditches in Parcel 1 and in the surrounding area, which connect to this waterbody, were dry and ephemeral, with arable and pasture fields on both banks. Most contained terrestrial vegetation and emergent linear-leaved plants in the channel and was choked with dense herb and tall grass on both banks.

3.1.6. The surveyed watercourse ID 11 in the north-west within the extended Site Boundary is situated behind newly erected 1.5m high fences.

3.1.7. Just north of the extended Site Boundary, Watercourse ID 3 was wet, with stagnant water and no perceptible flow. There was a culvert leading to the southern branch, and the channel width was less than 1m, with a depth of 5cm and a silt clay substrate. The banks were densely overgrown with scrub and trees, but there was no vegetation within the channel.

Plate 3 - Watercourse ID 3

3.1.8. Watercourse ID 15 running through the middle of Parcel 1 was a dry ephemeral ditch located in between arable and pasture fields, with terrestrial vegetation present within the channel. The ditch was choked with dense herbs, tall grass, and scrubs on both banks. In the southern section of the ditch, there was a small amount of stagnant water, approximately 1cm deep, leading to a pond.

Plate 4 - Watercourse ID 15

3.2. Preliminary aquatic survey – Parcel 1a

3.2.1. The majority of Parcel 1a is made up of arable and pasture fields, bordered by hedgerows. See **Figure 2** (**Annex A**) for the location of Watercourses and Pond IDs at Parcel 1a.

3.2.2. Parcel 1a comprised of only one pond, Pond ID 39 which was dry and densely covered with terrestrial vegetation. The pond had an earth substrate and was completely shaded by vegetation and surrounding trees.

3.2.3. Parcel 1a contained only one ephemeral watercourse, Watercourse ID 23-25 which runs along the northern boundary of the extended Site Boundary. At the time of the survey, the watercourse was dry, densely surrounded by scrub and terrestrial vegetation in the channel, causing it to become choked and overgrown.

Plate 5 - Watercourse ID 24

3.3. Preliminary aquatic survey – Parcel 2

3.3.1. The majority of Parcel 2 is made up of arable land, with pasture fields present in the south of Parcel 2, bordered by hedgerows along with small areas of scrub and woodlands. See **Figure 2** (**Annex A**) for the location of Watercourses and Pond IDs at Parcel 2.

3.3.2. Along the northern extended Site Boundary lie two large ponds, Pond 4 north of the boundary and Pond 68 to the south. Both are surrounded by agricultural land and a residential farmhouse. The ponds were 20 – 30cm in depth and consist of gravel, sand, and silt substrate. Both ponds

contained an island in the middle, fringed with riparian vegetation which resulted in low to moderate shading. Bankside trees, tall herb and short, maintained grasses surround the pond. Pond 68 also contained free-floating algal. The ponds were possibly ground water fed with low turbidity, with waterfowl also present.

Plate 6 - Pond ID 4

Plate 7 - Pond ID 68

3.3.3. Along the east boundary lies another large pond, Pond 6. The pond appeared to have a high level of silt substrate present and a depth greater than 30cm. Within the pond, floating broadleaved and emergent linear plants were present. The vegetation along the banks included dense tall herbs, grasses, trees, and scrub, resulting in high shading. The pond is surrounded by agricultural land and seems to form a series of interconnected ponds through culverts leading to a ditch. Additionally, there is a nearby broad-leaved woodland.

Plate 8 - Pond ID 6

3.3.4. Pond ID 62 lies in along the east boundary of Parcel 2. It has shall margins <10 cm but is deeper in the middle with emergent linear-leaved, broad-leaved and rooted broad-leaved present. The pond is surrounded by trees, tall herbs, scrub and grass with low shading on the pond. Pond ID 61 lies in the southern section of Parcel 2, has a depth of > 15cm and is choked with emergent linear vegetation. The pond is surrounded by agricultural land and is heavily poached. The pond is surrounded by dense tall herbs, grasses, trees and scrub which inhibits safe access.

Plate 9- Pond ID 61

3.3.5. Pond 5 also lies in the southern section of Parcel 2. It is a large pond with emergent linear, submerged fine-leaved and broad-leaved vegetation present. It is > 20cm in depth and is bordered by tall herbs, grasses, trees and scrubs which create moderate shading. This pond is connected to two in/outlet ditches and is suitable for invertebrates only.

3.3.6. Watercourse ID 36 lies along the eastern boundary of Parcel 2 which is an ephemeral ditch with stagnant water ponding near the road bridge. This area is surrounded by agricultural land and features dense trees and scrubs, but vegetation was lacking from within the channel itself. The substrate in this watercourse consisted of earth and silt.

Plate 10 - Watercourse ID 36

3.4. Preliminary aquatic survey – Parcel 3

3.4.1. The majority of Parcel 3 is made up of arable land in the south and pasture fields in the north, bordered by hedgerows along with small areas of scrub and woodland. See **Figure 2** (**Annex A**) for the location of Watercourses and Pond IDs at Parcel 3.

3.4.2. Parcel 3 only consists of three waterbodies. Note that Pond ID 80 could not be accessed due to barbed wire fencing. Pond ID 76 lies along the southern boundary and was shallow with silt and clay substrate with long linear-leaved and free-floating broad-leaved vegetation was present.

3.4.3. Pond ID 8, located along the south-east extended Site Boundary, was a small, possibly ephemeral, stagnant pool heavily poached by horses.

Plate 11 - Pond 8

3.4.4. Watercourse ID 48 lies along the northern and north eastern border of Parcel 3. It consists of a dry ephemeral ditch at the southern end and becomes a stagnant wet ditch with 5cm depth and a silt/clay substrate at the northern end. The channel was choked with terrestrial and aquatic vegetation, and both banks had poor access due to the dense woodland scrub and steep bank.

3.4.5. Opposite the tributary (trib 26500), the channel is 1.5 – 3m wide, with no perceptible flow, and a substrate of clay, silt, and some gravel/pebble. The area around the bridge was accessible, but elsewhere the channel was heavily vegetated and inaccessible with c. 2m high, vertical banks. The northernmost upper branch was flowing and comprised of a glide and riffle with gravel substrate and no in-channel vegetation. Both banks are steep and over 3m high. The north-west branch of the watercourse had steep banks and was wetted but choked with vegetation leading to a lack of perceptible flow. Several ditches branch off this channel and were dry.

Plate 12 - Watercourse ID 48, northern end

Plate 13 - Watercourse ID 48, southern end

4. Habitat commentary

4.1.1. Overall, there were only small sections of flowing watercourses. Notably, the northern section of Watercourse 48 in Parcel 3, but almost all of the other ditches on Site provided low to negligible opportunities for fish and invertebrates as they were dry and/or choked up with vegetation.

4.1.2. There were six large ponds present across the Site Boundary, including Parcel 1 Ponds ID 9 and 10, and Parcel 2 Ponds ID 4, 6, 5 and 68. There were no suitable ponds for fish or invertebrates in Parcel 1a or Parcel 3.

4.1.3. The six large ponds and small sections of wetted watercourses are likely to provide suitable all-year round habitat for a variety of aquatic species such as fish and invertebrates. If any impacts are predicted arising from the proposed development further surveys may be required to ensure no protected or notable species will be impacted from the proposed development. However, given that the ponds will be retained in their entirety with a suitable buffer between the development and the ponds together with the implementation of standard pollution control measures during the construction and operation phase no direct impacts are envisaged.

5. Conclusion

5.1.1. The preliminary aquatic walkover revealed that most ponds and watercourses are currently of low aquatic ecological value as they were dry and overgrown with aquatic and terrestrial vegetation. Consequently, they are unlikely to offer suitable habitats for any notable or protected aquatic species.

5.1.2. The wet watercourses largely contained stagnant water with high levels of silt which may restrict high levels of diversity due to the lack of oxygen, nutrient imbalance, limited shelter and breeding grounds, and restricted movement and dispersal.

Annex A: Figures

466000 467000 468000 469000 470000 471000 472000 473000 474000 475000 476000 477000 478000 479000

228000 227000 226000 225000 224000 223000 222000 221000 220000 219000 218000

Steeple Claydon
Twyford
Middle Claydon
East Claydon
East Claydon School
Furze Down School
Bennett's Hill
Granborough
Charndon
Edgcott
North Marston
Oving
Grendon Underwood
Pitchcott
Quainton
A41
Kingswood
Woodham
udgershall

Legend:

Site Boundary

Rev	Date	Description	Drn	Chk	App
00	15/07/2024	2485353	EC	RS	PT

Rosefield Solar Farm

Rosefield Solar Farm

TITLE: Figure 1:

Site Location Plan

0 500 1,000 1,500

Metres

SCALE: 1:40,000 @ A3

N W E S

REV 00

Document Path: C:\Users\Elise.Cliche\OneDrive - RSK Group\06 GIS - 2485353 - Rosefield Solar Farm\02 - APRX\2485353 - Rosefield Solar Farm - Figure 1 - Site Location Plan.aprx

469000 469200 469400 469600 469800 470000 470200 470400 470600 470800 471000 471200 471400

225400 225200 225000 224800 224600 224400 224200 224000 223800 223600 223400

Legend:

- Site Boundary
- 25m Buffer from Parcels 1, 1a, 2 and 3
- Ponds
- Watercourses

Rev	Date	Description	Drn	Chk	App
00	19/07/2024	2485353	EC	RJ	PT

Rosefield Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 2:
Waterbodies and Watercourses Within 25m of Parcels 1, 1a, 2 and 3
Page 1 of 4

0 100 200 300
Metres

SCALE: 1:8,000 @ A3

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Document Path: C:\Users\Elise.Cliche\OneDrive - RSK Group\06 GIS - 2485353 - Rosefield Solar Farm\02 - APRX\2485353 - Rosefield Solar Farm - Figure 2 - Waterbodies and Watercourses Within 25m.aprx

470400 470600 470800 471000 471200 471400 471600 471800 472000 472200 472400 472600 472800 473000

223400 223200 223000 222800 222600 222400 222200 222000 221800 221600 221400

30 23 24 25 39 29 63 62 33 12 61 5 58 34 89

Legend:

- Site Boundary
- 25m Buffer from Parcels 1, 1a, 2 and 3
- Ponds
- Watercourses

Buckingham A421 A4146 Winslow Leighton Buzzard Bicester A4421 A413 A418 A41 Ludgershall Kidlington Haddenham Aylesbu

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Rosefield Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 2:
Waterbodies and Watercourses Within 25m of Parcels 1, 1a, 2 and 3
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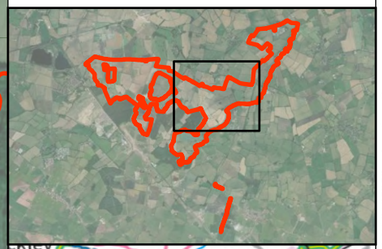
224800 224600 224400 224200 224000 223800 223600 223400 223200 223000 222800

Legend:

- Site Boundary
- 25m Buffer from Parcels 1, 1a, 2 and 3
- Ponds
- Watercourses



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RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 2:
Waterbodies and Watercourses Within 25m of Parcels 1, 1a, 2 and 3
Page 3 of 4

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Metres

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473800 474000 474200 474400 474600 474800 475000 475200 475400 475600 475800 476000 476200 476400

226200 226000 225800 225600 225400 225200 225000 224800 224600 224400 224200

48 8 50 49 44 47 45 43 80 76 40 41 81 42

Legend:

- Site Boundary
- 25m Buffer from Parcels 1, 1a, 2 and 3
- Ponds
- Watercourses

Rev	Date	Description	Drn	Chk	App
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Rosefield Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 2:
Waterbodies and Watercourses Within 25m of Parcels 1, 1a, 2 and 3
Page 4 of 4

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Metres

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Planning Inspectorate Scheme Ref: EN010158