Biodiversity Enhancement Strategy

Tysoe STW, Back Lane, Stratford-On-Avon

A Report To: Severn Trent
Report Number: RT-MME-160440-02
Date: June 2023

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Quality Assurance

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Declaration of Compliance

This study has been undertaken in accordance with British Standard 42020:2013 "Biodiversity, Code of Practice for Planning and Development". 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.

Disclaimer

The contents of this report are the responsibility of Middlemarch Environmental Ltd. It should be noted that, whilst every effort is made to meet the client's brief, no site investigation can ensure complete assessment or prediction of the natural environment.

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Contents

1. Introduction

1.1 Project Background

In May 2023, Severn Trent Water commissioned Middlemarch to prepare a Biodiversity Enhancement Strategy associated with a proposed development at Tysoe STW, Back Lane, Stratford-On-Avon.

Middlemarch was concurrently commissioned to complete a Preliminary Ecological Appraisal for Severn Trent Water at this site, and has previously carried out a Preliminary Ecological Appraisal in October 2019. The findings of these surveys are detailed in reports RT-MME-160440-01 and RT-MME-150887-04 respectively.

The overall aim of this document is to outline habitat retention, enhancement and creation opportunities that could be undertaken to improve the value of the site for biodiversity, taking into account the proposed development at the site. The Biodiversity Enhancement Strategy is underpinned by a Biodiversity Metric Assessment (See Appendices for Methods and completed Metric) to inform the relative change in the biodiversity value of the site as a result of the development before and after implementation of the proposed Biodiversity Enhancement opportunities.

It should be noted that the metric is only a proxy for biodiversity using habitat values and that any proposed enhancements should be designed using appropriate ecological expertise. Existing levels of protection afforded to protected species and to habitats are not changed by use of the metric and statutory obligations will still need to be satisfied. In addition, the metric cannot account for impacts on, or enhancements to, irreplaceable habitats or protected sites, which will need to be assessed separately.

1.2 Site Description and Context

Table 1.1 provides a brief summary of the site and its surroundings.

Attribute	Description
Location	Back Lane, Stratford-On-Avon
National Grid Reference	SP 33501 45128
Site Area (ha)	0.65 ha
Topography	Largely flat
Land Cover (on site)	The site consists of the sewage treatment works, which includes various structures, two reedbeds, and associated hardstanding, as well as areas of grassland.
Land Cover (site surrounds)	The wider landscape is dominated by agricultural land, with the villages of Lower Tysoe and Middle Tysoe to the east and the south.

Table 1.1: Summary of Site and Surroundings

1.3 Documentation Provided

The proposals involve the installation of a new laboratory, inlet pumping station, MCC kiosk, FE kiosk and other infrastructure at the STW site. The adjacent field will be used for site storage and welfare facilities to facilitate these works; however, the adjacent field is not included in this Biodiversity Enhancement Strategy. The MCC kiosk requires planning permission, but all other works are permitted development. The proposals are shown in the documentation provided by the client, as set out in Table 1.2.

Document / Drawing Number	Author
610062-GTE-XX-XX-M3-C-0001 - Sheet - T-0004 - PROPOSED SITE LAYOUT (1)	Galliford Try

Table 1.2: Documentation Provided by Client

2. Existing Baseline

The existing baseline conditions of the site detailed below are taken from the Preliminary Ecological Appraisal carried out by Middlemarch in May 2023 (Report RT-MME-160440-01).

2.1 Nature Conservation Sites

Tysoe Vale Ecosite/pLWS is located adjacent to the site, therefore impacts on this site from the proposed construction works are likely in the absence of appropriate mitigation. Further details regarding this site and other nature conservation sites can be found in the Preliminary Ecological Appraisal (Report RT-MME-160440-01).

2.2 Habitats

Table 2.1 summarises the habitat types and their value in biodiversity units provided. These areas are shown on Drawing C160440-01 in Chapter 6.

Phase 1 Habitat	UKHab Habitat Equivalent	Area (ha) / Length (km)	Description (distinctiveness, condition, connectivity and strategic significance)	Value (BU)
Area Based Habitats				
Amenity grassland	Modified grassland (g4)	0.11	Habitat is automatically classed as being of 'Low' distinctiveness and has been assessed as being in 'Poor' condition. The extent of this habitat lies outside any strategic area identified in the Warwickshire, Coventry and Solihull Green Infrastructure Strategy; it is therefore of 'Low' strategic significance.	0.22
Amenity grassland (TN1)	Modified grassland (g4)	0.02	Habitat is automatically classed as being of 'Low' distinctiveness and has been assessed as being in 'Moderate' condition. The extent of this habitat lies outside any strategic area identified in the Warwickshire, Coventry and Solihull Green Infrastructure Strategy; it is therefore of 'Low' strategic significance.	0.08
Hardstanding and structures	Developed land; sealed surface (u1b)	0.13	Habitat is automatically classed as being of 'Very Low' distinctiveness and does not require a condition assessment. The habitat is not a strategic habitat identified by the Warwickshire, Coventry and Solihull Green Infrastructure Strategy; it is therefore of 'Low' strategic significance.	0.00
Other habitat: Reedbed	Sustainable urban drainage feature (1170)	0.16	Habitat is automatically classed as being of 'Low' distinctiveness and has been assessed as being in 'Poor' condition. The habitat is not a strategic habitat identified by the Warwickshire, Coventry and Solihull Green Infrastructure Strategy; it is therefore of 'Low' strategic significance.	0.32
Poor semi-improved grassland	Other neutral grassland (g3c)	0.27	Habitat is automatically classed as being of 'Medium' distinctiveness and has been assessed as being in 'Poor' condition. The extent of this habitat lies outside any strategic area identified in the Warwickshire, Coventry and Solihull Green Infrastructure Strategy; it is therefore of 'Low' strategic significance.	1.08
Total Area (ha)		**0.69**	**Total Habitat Baseline (BU)**	**1.70**

Table 2.1: Summary of Existing Habitats and Linear Features

2.3 Species

The baseline surveys listed in Section 1.1 recorded the following protected or notable species of relevance to the proposed development:

- Amphibians;
- Badgers;
- Bats (foraging and commuting);
- Birds (nesting);
- Hedgehogs;
- Otters; and,
- Reptiles.

Further details regarding these species can be found in the Preliminary Ecological Appraisal by Middlemarch (Report RT-MME-160440-01).

3. Impacts and Future Baseline

3.1 Description of the Future Baseline

The future baseline for the purposes of this assessment is set out in the 610062-GTE-XX-XX-M3-C-0001 - Sheet - T-0004 - PROPOSED SITE LAYOUT (1) document provided by the client.

3.2 Impacts (In the Absence of Enhancement and Creation)

Habitats

Table 3.1 details the change in biodiversity units value of the site as a result of the proposed development, prior to any additional habitat restoration, creation or enhancement (Gross Impacts).

Phase 1 Habitat	UKHab Habitat	Habitats Retained		Habitat Retained for Enhancement		Habitat Loss	
		Area (Ha)	Value (BU)	Area (Ha)	Value (BU)	Area (Ha)	Value (BU)
Area based habitats							
Amenity grassland	Modified grassland (g4)	0.05	0.10	0.00	0.00	0.06	0.12
Amenity grassland (TN1)	Modified grassland (g4)	0.02	0.08	0.00	0.00	0.00	0.00
Hardstanding and Structures	Developed land; sealed surface (u1b)	0.13	0.00	0.00	0.00	0.00	0.00
Other habitat: Reedbed	Sustainable urban drainage feature (1170)	0.16	0.32	0.00	0.00	0.00	0.00
Poor semi-improved grassland	Other neutral grassland (g3c)	0.01	0.04	0.00	0.00	0.26	1.04
Total Impact (Area habitats)		**0.37**	**0.54**	**0.00**	**0.00**	**-0.32**	**-1.16**

Table 3.1: Summary of Gross Impacts on Habitats

Species

Table 3.2 summarises the potential impacts of the proposed development on species recorded within the site.

Species / Species Group	Summary Potential Impacts
Amphibians	Loss of terrestrial habitat opportunities. Harm/injury during construction phase.
Badgers	Loss of commuting, foraging and sett building habitat opportunities. Harm/injury during construction phase.
Bats	Loss and fragmentation of foraging and dispersal habitat. Habitat fragmentation and degradation. Displacement of foraging routes due to light spill.
Birds	Loss of nesting and foraging habitat. Harm/injury of birds and/or nests during construction phase.
Hedgehogs	Loss of commuting, foraging and nesting habitat. Harm/injury during construction phase.
Otters	Harm/injury during construction phase.
Reptiles	Loss of foraging, commuting, and basking habitat. Harm/injury during construction phase.

Table 3.2: Summary of Potential Species Impacts

3.3 Habitat Restoration

Table 3.3 highlights the return value of any lost habitats that are restored upon completion of the construction works. Restored habitats are any habitat within the 10 m development buffer zone which are considered to be negatively impacted during construction works e.g. by machinery.

It has been assumed that these habitats will be restored to the same habitat type and in the same condition post-development, aside from a 1.5 m buffer of poor semi-improved grassland surrounding the proposed new hardstanding and structures (equivalent to 0.06 ha), which will be restored to amenity grassland.

Landscape Typology	UKHab Habitat Equivalent	Area (ha)	Description (target distinctiveness, condition, connectivity strategic significance and risk multipliers)	Value (BU)
Habitats				
Amenity grassland	Modified grassland (g4)	0.05	Habitat will be restored to amenity grassland post development. This habitat is of 'Low' distinctiveness. The target condition will be as per the existing baseline of 'Poor'. This habitat is of 'Low' strategic significance.	0.10
Amenity grassland	Modified grassland (g4)	0.06	Habitat surrounding proposed hardstanding and structures will be restored to amenity grassland post development (previously poor semi-improved grassland). This habitat is of 'Low' distinctiveness. The target condition will be 'Poor'. This habitat is of 'Low' strategic significance.	0.12
Poor semi-improved grassland	Other neutral grassland (g3c)	0.08	Habitat will be restored to poor semi-improved grassland post development. This habitat is of 'Medium' distinctiveness. The target condition will be as per the existing baseline of 'Poor'. This habitat is of 'Low' strategic significance.	0.30
Total Creation (Area Habitats)		**0.19**	**Total Habitat Baseline (BU)**	**0.51**

Table 3.3: Summary of Habitats to be Restored

4. Biodiversity Enhancement Opportunities

4.1 Overview of Biodiversity Enhancement Opportunities

Table 4.1 below summarises the compensation/enhancement opportunities which could be delivered at the site to secure a gain for biodiversity. Detailed descriptions of the aims, specifications and management of the enhancement opportunities are described in Section 4.2 – 4.4 below. The location and extent of all habitat creation opportunities are shown on Drawing C160440-02-02 in Section 6.

Proposed Feature/Enhancement	Description	Biodiversity Benefits
Modified grassland	• Enhancement of 0.05 ha of retained modified grassland from poor to moderate condition • Creation of 0.03 ha of modified grassland in moderate condition (previously modified grassland in poor condition) • Creation of 0.06 ha of modified grassland in moderate condition (previously neutral grassland in poor condition)	• Improved grassland quality • Improved foraging resource for badgers, hedgehogs and small mammals
Neutral grassland	• Enhancement of 0.01 ha of retained neutral grassland from poor to moderate condition • Creation of 0.08 ha of neutral grassland in moderate condition (previously neutral grassland in poor condition) • Creation of 0.02 ha of neutral grassland in moderate condition (previously modified grassland in poor condition)	• Improved grassland quality • Improved habitat resource for amphibians, bats, badgers, birds, hedgehogs, invertebrates, small mammals and reptiles
Individual trees	• Planting of 10 individual trees in moderate condition across the site	• Increase connectivity and structural diversity across the site • Improve habitat resource for invertebrates • Enhance foraging opportunities for birds and bats

Table 4.1: Summary of Biodiversity Enhancement Opportunities

4.2 Modified Grassland

Aim

To enhance 0.05 ha of retained modified grassland (referable to Phase 1 Habitat Type J1.2 Amenity grassland) from poor to moderate condition[1], create 0.03 ha of modified grassland in moderate condition (previously modified grassland in poor condition) and create 0.06 ha of modified grassland in moderate condition (previously neutral grassland in poor condition).

Habitat Creation and Enhancement

These habitats will be enhanced / created through harrowing, overseeding and management to reach the desired target condition of 'Moderate'. The following approach will be implemented:

- *Ground preparation:* In the area to be enhanced, the grass should firstly be cut very short in late summer and all arisings removed. Any grass remaining in the buffer zone post-development should also be cut as above. The ground should then be well harrowed or raked to create areas of bare ground (aiming to create around 50% bare soil) to allow new seeding to establish. Once the ground is prepared, the area should be overseeded with a flowering lawn mix from a local source if possible or a tailored mix from a supplier such as Emorsgate, selecting a mix suitable for the soil and light conditions. This would allow a greater range of wildflowers to establish within the existing grassland.
- *Seed Mix*: Emorsgate EL1 (Flowering Lawn Mixture) seed mix is advised for this site. The seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture. The species included in the mix are detailed in Table 4.2.
- *Establishment*: During the first year it is likely that the vegetation will be dominated by grass species and annual weeds arising from any remnant seed in the subsoil. This annual growth will be controlled by mowing regularly (every 7 -10 days during growing season) throughout the first year to minimise competition and weed seed production. The sward should be cut to a height of 40-60mm, with dense arisings removed from site to minimise the enrichment of the soil with nutrients.

[1] 'Moderate' Ecological Condition as assessed against the Grassland (Low value) in Natural England (2023) The Biodiversity Metric 4.0 – User Guide: Technical Annex 1 Condition Sheets and Methodology. Natural England Joint Publication JP039. Available http://publications.naturalengland.org.uk/publication/6049804846366720

%	Latin Name	Common Name
Wildflowers		
2.4	*Centaurea nigra*	Common knapweed
0.8	*Leontodon hispidus*	Rough hawkbit
1.2	*Galium verum*	Lady's bedstraw
2.4	*Lotus corniculatus*	Bird's-foot trefoil
2.8	*Plantago lanceolata*	Ribwort plantain
0.8	*Primula veris*	Cowslip
0.4	*Silaum silaus*	Pepper saxifrage
1.2	*Ranunculus acris*	Meadow buttercup
1.0	*Stachys officinalis*	Betony
0.4	*Vicia cracca*	Tufted vetch
Grasses		
8.0	*Agrostis capillaris*	Common bent
1.0	*Carex flacca*	Glaucous Sedge
39.0	*Cynosurus cristatus*	Crested dogstail
28.0	*Festuca rubra*	Red fescue
4.0	*Poa pratensis*	Smooth-stalked meadow-grass
Clovers, legumes and herbs		
5.0	*Medicago lupulina*	Black Medick
5.0	*Trifolium repens*	Small Leaved White Clover

Table 4.2: Emorsgate EL1 – Flowering Lawn Mixture

Future Management

The grassland should be managed to allow a varied sward height (at least 20% of the sward less than 7 cm and at least 20% of the sward more than 7 cm) and presence of 6-8 species per m². Management should also monitor the amount of scattered scrub encroaching the grassland and removal should be undertaken to ensure this does not increase above 20%. If areas of bare ground appear within the grassland these areas should be overseeded, as detailed above. Management should ensure no bracken cover and no invasive non-native species (as listed on Schedule 9 of the Wildlife and Countryside Act, 1981). Once the grassland has been cut all arisings should be removed to prevent nutrient enrichment.

4.3 Neutral Grassland

Aim

To enhance 0.01 ha of retained neutral grassland (referable to Phase 1 Habitat Type B6 Poor-semi-improved grassland) from poor to moderate condition[2], to create 0.08 ha of neutral grassland

[2] 'Moderate' Ecological Condition as assessed against the Grassland (Medium, high and very high value) in Natural England (2023) The Biodiversity Metric 4.0 – User Guide: Technical Annex 1 Condition Sheets and Methodology. Natural England Joint Publication JP039. Available http://publications.naturalengland.org.uk/publication/6049804846366720

in moderate condition (previously neutral grassland in poor condition) and to create 0.02 ha of neutral grassland in moderate condition (previously modified grassland in poor condition).

Habitat Creation and Enhancement

These habitats will be created by stripping existing topsoil, preparing the subsoil, and sowing with an appropriate native species mix. The following approach will be implemented:

- *Ground Preparation:* The ground in which the wildflower sowing is proposed will be prepared to reduce the fertility of the seedbed. The top 150 mm of topsoil will be stripped, and the subsoil will be prepared using a harrow to create a medium tilth. The soil will then be rolled to produce a firm planting surface. Topsoil arising from this activity will be utilised on site where possible.
- *Seed Mix*: Emorsgate EM2 (Standard General Purpose Meadow) seed mix is advised for this site. The seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture. The species included in the mix are detailed in Table 4.3.
- *Establishment*: During the first year it is likely that the vegetation will be dominated by grass species and annual weeds arising from any remnant seed in the subsoil. This annual growth will be controlled by mowing regularly (every 7 -10 days during growing season) throughout the first year to minimise competition and weed seed production. The sward should be cut to a height of 40-60mm, with dense arisings removed from site to minimise the enrichment of the soil with nutrients.

%	Latin Name	Common Name
Wildflowers		
3.5	*Centaurea nigra*	Common knapweed
0.1	*Daucus carota*	Wild carrot
1	*Filipendula ulmaria*	Meadowsweet
0.3	*Galium verum*	Lady's bedstraw
0.5	*Leucanthemum vulgare*	Oxeye daisy
0.9	*Lotus corniculatus*	Bird's-foot trefoil
1	*Malva moschata*	Musk mallow
2	*Plantago lanceolata*	Ribwort plantain
0.1	*Primula veris*	Cowslip
0.1	*Prunella vulgaris*	Selfheal
1	*Ranunculus acris*	Meadow buttercup
1	*Stachys officinalis*	Betony
3.5	*Vicia cracca*	Tufted vetch
Grasses		
8.5	*Agrostis capillaris*	Common bent
34	*Cynosurus cristatus*	Crested dogstail
25.5	*Festuca rubra*	Red Fescue
17	*Poa pratensis*	Smooth-stalked meadow-grass

Table 4.3: Emorsgate EM2 – Standard General Purpose Meadow Mixture

Future Management

In subsequent years, the grassland will be managed under a traditional meadow regime, which is based around a summer hay cut (late July/August). Once cut, the arisings should be left to shed seed for one to seven days and then be removed from site. The hay cut should be followed by further cuts in autumn and/or early spring to reduce early growth of competitive grasses.

4.4 Individual trees

Aim

To plant ten individual trees (referable to Phase 1 Habitat Type A3 Parkland and scattered trees) and maintain in moderate condition[3].

Habitat Creation and Enhancement

These habitats should be created by mowing the existing vegetation and planting the new native trees with tree guards.

The following approach will be implemented:

[3] 'Moderate' Ecological Condition as assessed against the Individual Trees in Natural England (2023) The Biodiversity Metric 4.0 – User Guide: Technical Annex 1 Condition Sheets and Methodology. Natural England Joint Publication JP039. Available http://publications.naturalengland.org.uk/publication/6049804846366720

- *Ground Preparation:* The ground in which the tree planting is proposed should not be overgrown with grass. The grass should be cut short in order to make planting easier and reduce competition for water. The location for tree planting should be marked out using spray paint or canes.
- *Planting Mix*: Native broadleaved tree planting is recommended; suggested tree species are provided within Table 4.4 below. Trees are best planted between November and March when the trees are dormant. Trees should be stored upright, sheltered from frost and wind and if the roots look like they are drying out they should be lightly sprayed with water to keep them moist.
- *Establishment*: Trees should be planted between one and five metres apart. Pit planting should be used to ensure the trees have a greater contact with the soil. A cane and tree guard should be installed to protect the tree, the guard should be pushed one centimetre into the ground to prevent vermin from getting in. Tree establishment should be audited monthly. Trees should be watered as required during summer months with failed/damaged/diseased specimens replaced on a like-for-like basis. If damage is occurring to specimens, then the cause should be identified, and remedial action undertaken. Vegetation growing around the newly planted trees should be maintained at a short height to reduce competition.

Latin Name	Common Name
Quercus robur	English oak
Sorbus aucuparia	Rowan
Tilia cordata	Small-leaved lime
Prunus avium	Wild cherry
Alnus glutinosa	Alder
Fagus sylvatica	Beech
Betula pendula	Silver birch

Table 4.4: Native Broadleaved Tree Species

Future Management

Tree guards should be carefully removed on trees which have been established for more than five years. Tree guards, ties and stakes must be disposed of at a registered site. Deadwood, over 10 cm in diameter, should be maintained as standing or fallen deadwood on site. Audit the trees and monitor the biodiversity value of the habitat, which would also identify any anthropogenic damage e.g. from compaction. Undertake tree pruning works, as required, outside of the peak bird nesting season, October to February inclusive.

4.5 Summary Value of Habitat Creation/Enhancement Opportunities

Table 4.5 summarises the value of all habitat creation and enhancement proposals.

Landscape Typology	UKHab Habitat Equivalent	Area (ha)	Description (target distinctiveness, condition, connectivity strategic significance and risk multipliers)	Value (BU)
Habitats				
Amenity grassland	Modified grassland (g4)	0.05	Enhancement of retained modified grassland from 'Poor' to 'Moderate' condition. Modified grassland is automatically classified as being of 'Low' distinctiveness. This habitat is of 'Low' strategic significance.	0.17
Amenity grassland	Modified grassland (g4)	0.03	Reinstatement of modified grassland in 'Moderate' condition post development (previously modified grassland in 'Poor' condition). Modified grassland is automatically classified as being of 'Low' distinctiveness. This habitat is of 'Low' strategic significance.	0.10
Amenity grassland	Modified grassland (g4)	0.06	Creation of modified grassland in 'Moderate' condition post development (previously neutral grassland in 'Poor' condition). Modified grassland is automatically classified as being of 'Low' distinctiveness. This habitat is of 'Low' strategic significance.	0.21
Poor semi-improved grassland	Other neutral grassland (g3c)	0.01	Enhancement of retained neutral grassland from 'Poor' to 'Moderate' condition. Neutral grassland is automatically classified as being of 'Medium' distinctiveness. This habitat is of 'Low' strategic significance.	0.07

Table 4.3 (continues): Summary of Habitat Creation and Enhancement Proposals

Landscape Typology	UKHab Habitat Equivalent	Area (ha)	Description (target distinctiveness, condition, connectivity strategic significance and risk multipliers)	Value (BU)
Poor semi-improved grassland	Other neutral grassland (g3c)	0.08	Reinstatement of neutral grassland in 'Moderate' condition post development (previously neutral grassland in 'Poor' condition). Neutral grassland is automatically classified as being of 'Medium' distinctiveness. This habitat is of 'Low' strategic significance.	0.54
Poor semi-improved grassland	Other neutral grassland (g3c)	0.02	Creation of neutral grassland in 'Moderate' condition post development (previously modified grassland in 'Poor' condition). Neutral grassland is automatically classified as being of 'Medium' distinctiveness. This habitat is of 'Low' strategic significance.	0.13
Hardstanding and Structures	Developed land; sealed surface (u1b)	0.14	Comprises the new area of built development (buildings and hardstanding). The habitat type is automatically assessed as being 'Very low' distinctiveness and due to the limited attributes for biodiversity is not assigned a condition.	0.00
Scattered trees	Individual trees	0.04	Planting individual trees in 'Moderate' condition. Individual trees are automatically classified as being of 'Medium' distinctiveness. This habitat is of 'Low' strategic significance.	0.12
Total Creation and Enhancement (Area Habitats)		**0.43**	**Total Habitat Baseline (BU)**	**1.34**

Table 4.3: Summary of Habitat Creation and Enhancement Proposals (continued)

5. Conclusions & Recommendations

5.1 Conclusions

Table 5.1 details the change in biodiversity value of the site with and without the implementation of the habitat enhancement opportunities detailed in Chapter 4.

	Change without BES	Change with BES
On-site baseline	1.70	1.70
On-site post-intervention (Including habitat loss, retention, restoration enhancement and creation)	1.05	1.74
Total net unit change	-0.65	0.04
Total net % change	-38.22%	2.74%

Table 5.1: Biodiversity Metric Assessment – Headline Results

The existing value of the habitats on site is **1.70 biodiversity units (BU)**. Without any additional enhancement opportunities, the future baseline value of the site will be **1.05 BU**, a **38.22% loss** from the site's baseline biodiversity value.

The prospective future baseline upon implementation of the Biodiversity Enhancement Proposals detailed in Section 4 could be **1.74 BU**, a **2.74% net gain** over baseline values.

The projected onsite habitat values given in this report are based on the assumption that appropriate management will be implemented to ensure that the habitats will become established and maintained to fulfil their intended biodiversity value. Biodiversity Net Gain Principles[4] necessitates that any biodiversity units claimed must be deliverable over a minimum period of 30 years. As such, the proposed management must be long-term and provide scope for monitoring and reporting to demonstrate that the intended values are achieved over the 30-year period. A recommendation to this effect is included in Section 5.2 below.

5.2 Recommendations

R1 **Residual Requirement:** Further discussion should be carried out regarding the provision of the aspirational target of 15% net gain. If a solution cannot be secured on site, other Severn Trent Water landholdings could be considered for potential enhancements to address the residual requirement of **0.22 BU** for area habitats. Alternatively, the Local Planning Authority could be contacted to discuss the provision of an offsite compensation solution.

R2 **Metric Review:** The habitat enhancement and creation proposals included within this report are suggestions which could be included as part of the proposed works in order to work towards the target of 15% net gain to biodiversity. The metric calculations detailed in this report should be reviewed once specific proposals and/or landscaping plans have

[4] CIRIA, CIEEM, IEMA (2016) *Biodiversity Net Gain: Good Practice Principles for Development* [Available https://cieem.net/wp-content/uploads/2019/02/Biodiversity-Net-Gain-Principles.pdf]

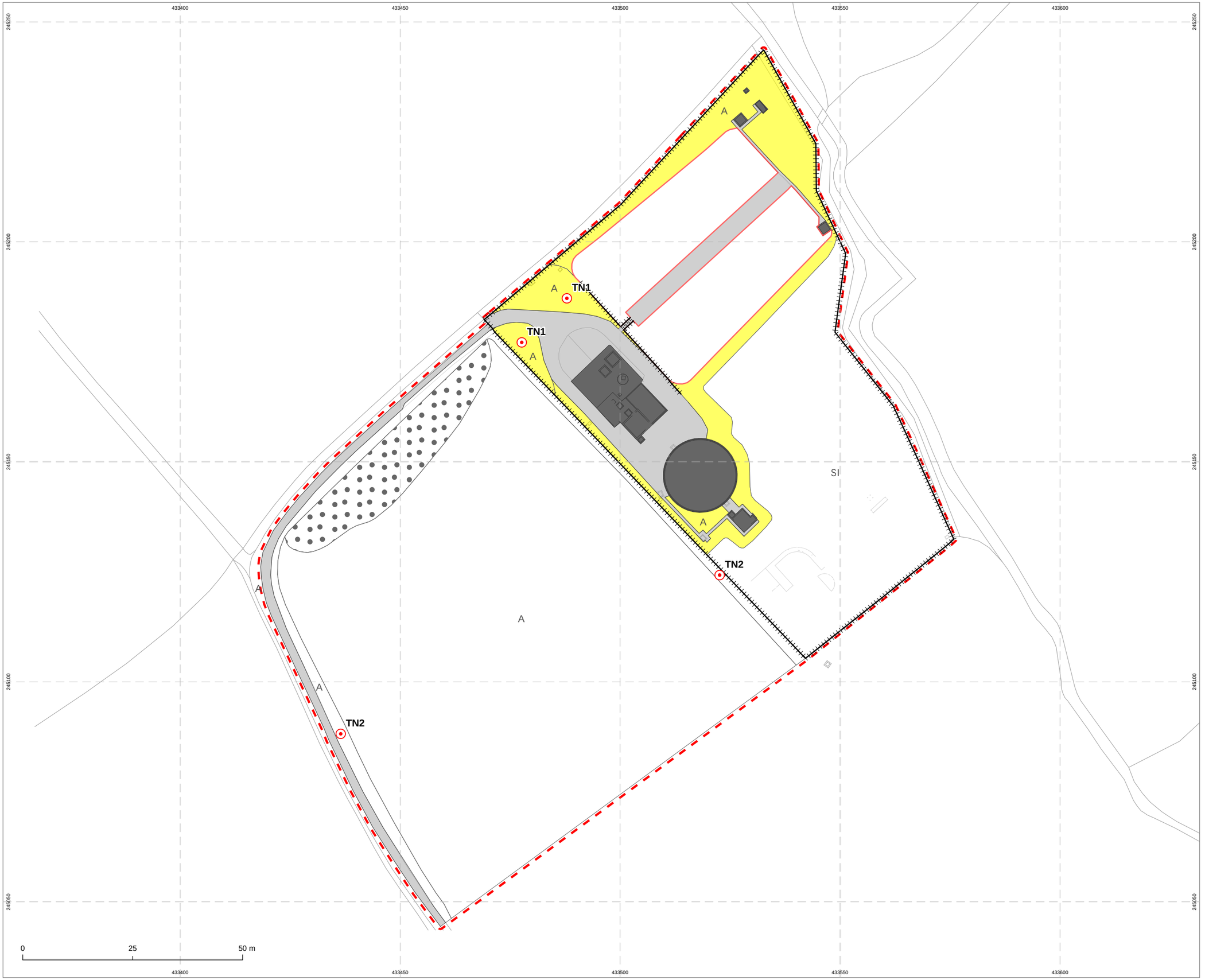
been confirmed, to provide an updated calculation of any net loss or gains for biodiversity that are likely to be achieved in the final scheme design. The final metric calculations should include all proposed compensation measures, including off-site compensation if required, to demonstrate the level of biodiversity net gain that will be achieved overall.

R3 **Landscape and Ecological Management Plan (LEMP):** A LEMP should be produced for all habitats proposed within the site. The LEMP should set out the appropriate establishment and management prescriptions required to achieve and maintain the intended type and condition of each habitat feature proposed. The LEMP should cover a minimum period of 30 years and include provisions for monitoring, review, reporting and contingency throughout.

6. Drawings

Drawing C160440-01-01 – Phase 1 Habitat Survey

Drawing C160440-02-01 – Habitat Creation and Enhancement Opportunities



C160440-01-01

Legend

- Target note
- Fence
- Survey area
- A — Amenity grassland
- A — Arable
- Bare ground
- Building/Infrastructure
- Hardstanding
- Other habitat: Treatment reed bed
- SI — Poor semi-improved

N

Project	Tysoe STW
Drawing	Phase 1 Habitat Map
Client	Severn Trent Water
Drawing Number: C160440-01-01	Revision: 00
Scale @ A3: 1:800	Date: June 2023
Approved By: JJ	Drawn By: CD/BD

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SITE OVERVIEW @ 1:4,000

C160440-02-01

Legend

- Proposed tree in moderate condition
- Survey area
- Created/enhanced modified grassland in moderate condition
- Created/enhanced neutral grassland in moderate condition
- Retained habitat
- Proposed hardstanding and structures
- Offsite STW

N

Project	Tysoe STW
Drawing	Habitat Enhancement Opportunities
Client	Severn Trent Water
Drawing Number: C160440-02-01	Revision: 00
Scale @ A3: 1:550	Date: June 2023
Approved By: JJ	Drawn By: BD

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Appendix 1

Biodiversity Metric Assessment (Methods and Assumptions)

Appendix 1 – Biodiversity Metric Assessment

This section describes the data and assumptions used to inform the Biodiversity Metric Assessment (BMA) for Tysoe STW. The completed Biodiversity Metric 4.0 Calculator tool is included in Appendix B.

Assessment Scope

The purpose of the BMA is to identify the change in biodiversity value that may result from a change in land use (e.g. development) or management (e.g. biodiversity enhancement) at the site and to establish if a net gain for biodiversity can be achieved. The BMA utilises a biodiversity metric to provide a proxy measure of biodiversity based on habitat attributes, which can then be used to determine the relative change in biodiversity value resulting from any land use or management measures proposed.

It should be noted that the metric is only a proxy for biodiversity using habitat values and that any proposed enhancements should be designed using appropriate ecological expertise. Existing levels of protection afforded to protected species and habitats are not changed by use of the metric and statutory obligations will still need to be satisfied. In addition, the metric cannot account for impacts on, or enhancements to, irreplaceable habitats, protected sites, or species features (e.g. bat boxes) which will need to be considered separately.

Biodiversity Metric Tool

The calculations used in the BMA were undertaken using 'The Biodiversity Metric 4.0' and associated User Guide[5] and Technical Supplement[6].

Existing Baseline Data

The baseline habitat data and condition assessment for the site is taken from the field survey data presented in the Tysoe STW Preliminary Ecological Appraisal by Middlemarch (report RT-MME-160440-01) and is summarised in Section 2 of this Strategy.

The Biodiversity Metric 4.0 calculator tool utilises the UK Habitat Classification System (UKHab) as the standard data input for habitats. The Phase 1 Habitat Survey data for the site was subsequently converted for the purposes of the metric calculation using the Phase 1 habitats to UKHab translation feature included in the Biodiversity Metric 4.0 calculator tool or professional opinion.

Each existing habitat or linear feature recorded within the site is assigned a score for 'Distinctiveness', 'Condition' and 'Strategic Significance'. Table A1 below describes how each habitat attribute has been determined for the existing baseline habitats in the metric assessment.

[5] Natural England (2023) The Biodiversity Metric 4.0 – User Guide. Natural England Joint Publication JP039. Available http://publications.naturalengland.org.uk/publication/6049804846366720

[6] Natural England (2023) The Biodiversity Metric 4.0 – User Guide: Technical Annex 1 Condition Sheets and Methodology. Natural England Joint Publication JP039. Available http://publications.naturalengland.org.uk/publication/6049804846366720

Attribute	Description
Distinctiveness	An automated score based on the type of habitat present and its value to wildlife. Highly diverse habitats such as those listed as Habitats of Principal Importance under the NERC Act (2006) or Annex 1 habitats in the Habitats Directive (1992) score highly in this category, whilst highly modified and low diversity habitats such as arable crops will have low distinctiveness scores.
Condition	A score based on the quality of the habitat parcel against published condition criteria (See report RT-MME-160440-01).
Strategic significance	A score based on information set out in local plans or policies. In this instance, a strategic location was defined as an area/habitat detailed within the Warwickshire Green Infrastructure map for Warwickshire, Coventry and Solihull[7] which specifically targets grassland and woodland habitats. In this case, the site was located within neither a Strategic Grassland Area nor a Strategic Woodland Area.

Table A1: Habitat Attributes for Existing Baseline Habitats

The value of each habitat parcel (or linear feature) is presented in terms of habitat (or hedgerow/river) 'biodiversity units' (BU).

Future Baseline Data

The future baseline conditions of the site are based on 610062-GTE-XX-XX-M3-C-0001 - Sheet - T-0004 - PROPOSED SITE LAYOUT (1) by Galliford Try. This describes the impacts of the proposed development and the post-development value of the site prior to any compensation or enhancement. Where there are no detailed landscaping proposals provided, it is assumed that the original habitat type and condition are restored to their baseline value. The value of any impacts and restored habitats are summarised in Section 3 of this report.

The proposed enhancement opportunities detailed in Section 4 provide the additional biodiversity value if the proposals are implemented. Table A2 below describes how the attributes of each habitat enhancement opportunity have been calculated to determine the additional biodiversity value that could be provided through the Biodiversity Enhancement Opportunities.

[7] Warwickshire, Coventry and Solihull Green Infrastructure map, available at: https://maps.warwickshire.gov.uk/greeninfrastructure/

Attribute	Description
Distinctiveness	An automated score based on professional opinion about the projected habitat type proposed, taking into account the landscaping proposals detailed in 610062-GTE-XX-XX-M3-C-0001 - Sheet - T-0004 - PROPOSED SITE LAYOUT (1) by Galliford Try.
Condition	A target condition score of the proposed habitat parcel based on professional opinion about the outline enhancement and future management proposals.
Strategic significance	A score based on information set out in local plans or policies. In this instance, a strategic location was defined as an area/habitat detailed within the Warwickshire Green Infrastructure map for Warwickshire, Coventry and Solihull.
Time to Target Condition	Time to target condition is automatically assigned in accordance with the Biodiversity Metric Tool 4.0. This multiplier can be adapted manually to reflect situations where a habitat is created in advance or where there is a delay in the project timescales for new habitat creation (e.g. project phasing).
Difficulty of Recreation	An automated value based on the difficulty of creating the target habitat. This value is unchanged from the values generated in Metric 4.0.

Table A2: Habitat Attributes for Existing Baseline Habitats

Following the calculation of the existing and future biodiversity value of the site, a calculation of the net biodiversity change is carried out to determine the 'Post-intervention habitat units', along with a figure for the percentage of net biodiversity impact loss (or gain).

Metric Assumptions

The following assumptions were applied as part of the metric assessment:

- For the purposes of this report, the term 'Habitat Loss' is applied to proposals that result in a change of habitat type or habitat 'distinctiveness'. This is defined in the Biodiversity Metric even where the new habitat type is created without any physical loss of the previous habitat type (e.g. creation of scrub over grassland). 'Habitat Enhancement' is applied where the habitat type and 'distinctiveness' remains the same, but the 'condition' of the habitat is improved.
- The BMA necessitates an estimation of future baseline values, based on professional opinion, to determine the change in biodiversity value that could occur as a result of the proposals at the site. The assumptions about target habitat types or condition in this report are based on professional opinion about the likely achievable outcomes at the site, based on the proposed plans and presumed management resources. All target habitats presume the implementation of a long-term management plan to achieve these ends and a recommendation to this effect is given in Section 5.

Appendix 2

Biodiversity Metric 4.0 Calculator Tool (Excel Sheet attached separately)