MOTT MACDONALD

Hodder WTW Amp 6 Renovation Project

Preliminary Ecological Appraisal

21 November 2019

Mott MacDonald
Floor 3
1 Whitehall Riverside
Leeds LS1 4BN
United Kingdom

T +44 (0)113 394 6700
F +44 (0)113 394 6701
mottmac.com

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Contents

Executive Summary

Mott MacDonald Bentley was appointed by United Utilities (UU) to undertake a Preliminary Ecological Appraisal (PEA) of the Hodder site, which is located approximately 2km north east of Slaidburn in the Forest of Bowland.

The proposed development comprises increasing the capacity of Stocks Reservoir by raising the level of the overflow weir by 300mm. Additionally works will take place within the Hodder Water Treatment Works (WTW) including the installation of a rapid gravity filter system. The works will take approximately two to three years.

A field survey, in the form of an extended Phase 1 Habitat Survey was undertaken by a suitably qualified Ecologist on the 17th April 2019 at Hodder WTW and of the perimeter of Stocks Reservoir on the 24th April 2019.

There are eight statutory designated sites within 2km. Due to the location of and nature of the proposed works it is unlikely that any impacts will occur on any statutory designated sites.

There are 32 non-statutory designated sites within 2km, two are within the Site which include Stocks Reservoir Biological Heritage Site (BHS) and the River Hodder BHS. Stocks Reservoir BHS is designated for inundation vegetation, wildfowl and waders and the River Hodder is designated for species such as otter and fish. Further surveys are required (as described in Section 4) for further information and to ensure that they will not be impacted by the works or suitable mitigation can be implemented.

A total of 17 habitats were recorded within the Zone of Influence.

Woodland and vegetation such as scrub provide suitable habitat for breeding birds. The shore of Stocks Reservoir and the islands provide suitable habitat for breeding, wintering and migratory waders and wildfowl.

Building 2 was recorded as a confirmed bat roost due to the presence of bat droppings and a bat on the internal wall. Three other buildings were recorded with high bat potential and two buildings were recorded with low bat roosting potential. One tree was recorded at the WTW with bat potential but will not be affected by the works.

Otter are using Stocks Reservoir and the River Hodder for commuting and foraging which was confirmed by evidence such as spraints and active resting sites.

PLEASE NOTE CONFIDENTIAL INFORMATION HAS BEEN REMOVED FROM THIS SECTION

Evidence of roe deer and the potential for brown hare and hedgehog was recorded on Site.

Common amphibians and reptiles are within the Site and surrounding landscape.

Invertebrates and fish are present but will not be affected by the works.

Mitigation measures and potential enhancements relating to the ecological features listed above are described in Section 4.

1 Introduction

1.1 Background

Mott MacDonald Bentley was appointed by United Utilities (UU) to undertake a Preliminary Ecological Appraisal (PEA) of the Hodder site, which is located approximately 2km north east of Slaidburn in the Forest of Bowland, National Grid Reference of the site SD 71885 54414 (see Appendix B). The area within the red line boundary in Appendix B is hereafter referred to as “the Site” as this includes any areas to which direct or indirect impacts will occur.

The proposed development comprises increasing the capacity of Stocks Reservoir by raising the level of the overflow weir by 300mm which will give a top water level of 180.87m above ordinance datum (mAOD). This will be carried out either by using pre-cast coping units or in-situ concrete construction. This will be confirmed during detail design. Whilst carrying out the works the reservoir will need to be drawn down to approximately 177.5mAOD, however the works will be carried out in summer months when water levels are relatively low.

Additionally, works will occur around the Hodder Water Treatment Works (WTW) including:

- Process trial to establish feasibility of upgrading and optimising the existing multi-flow lamella operation. Start on site was May 2019, the construction works will take approximately three weeks.
- Replacement of existing Bells first stage pressure filters with a new filtration process. This will be a rapid gravity filter system with 8 tanks at 85m^2 area per tank along with associated pipework and housing. New clean backwash tanks will also be constructed along with two dirty wash-water storage tanks. These works will be constructed in an area of existing trees which will need to be cleared.
- Works to the Lime Dosing process include providing flushing points on the dosing lines up and downstream of the pre-coagulation pumps, amending the arrangement and control system of the existing pumps and replacing the pre-manganese contactor dosing pumps.

The duration of the works is approximately two to three years. A map of these works can be found in Appendix E.

1.2 Aims and Objectives

The aim of this report is to provide an assessment of the protected and/or notable habitats and species which occur or have the potential to occur on or near the site which may be impacted by the proposed works. The report follows the ‘Guidelines for Preliminary Ecological Appraisal’ (CIEEM, 2017).

The objectives are to:

- Identify any designated sites for nature conservation and habitats on, near and adjacent to the site;
- Identify any notable and/or protected plant or animal species of conservation value, which may occur on or near the site;
- Identify the presence of any invasive plant species on or adjacent to the site;

- Provide a habitat map with target notes of ecological features as identified above;
- Undertake a preliminary assessment of the potential impacts on any ecological receptors of conservation value identified on, near or adjacent to the site; and
- Recommend further surveys, mitigation and enhancement measures as appropriate.

1.3 Zone of Influence

The current guidance on ecological assessments (CIEEM, 2019) recommends that all ecological features that occur within a 'zone of influence' (Zol) for a proposed development are investigated. The Zol includes:

- Areas directly within the land take for the proposed development and access;
- Areas which will be temporarily affected during construction;
- Areas likely to be impacted by hydrological disruption; and
- Areas where there is a risk of pollution and noise disturbance during construction and/or operation.

The Zol is variable depending on the ecological receptors affected. With respect to this report it is considered to be all land within the Site boundary unless stated otherwise.

1.4 Legislative and Policy Framework

The construction and operational activities for the proposed works must comply with the International, European and UK nature conservation legislation, and with national and local biodiversity policies. The main pieces of legislation in the UK are the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended). The biodiversity policies which are most relevant are the National Planning Policy Framework (NPPF, 2018), Biodiversity 2020, and the Lancashire Biodiversity Action Plan (Lancashire BAP).

Under the Natural Environment and Rural Communities (NERC) Act 2006, all public bodies are required to have regard to biodiversity conservation when carrying out their function. Under this act a list of habitats and species that are of principal importance for the conservation of biodiversity in England are published under Section 41 (S41).

1.5 Previous Information

A number of surveys of the Site were undertaken and reports produced by Bowland Ecology on behalf of UU in 2014. Building and pond numbers have been kept the same to ensure consistency through the project. These reports have been used for information during this assessment and comprise:

- Extended phase 1 of Hodder WTW and Stocks Reservoir;
- Breeding bird report;
- Bat survey report; and
- Amphibian report.

1.6 Quality Assurance & Environmental Management

All Ecologists involved in the production of this report are members of Chartered Institute of Ecological and Environmental Management (CIEEM) and are bound by its code of professional conduct. All surveys and assessments have been undertaken with reference to the

recommendations given in ‘BS 42020:2013 Biodiversity: Code of practice for planning and development’.

2 Methods

2.1 Desk Study

A desk study was undertaken of the designated sites for nature conservation, habitats of conservation importance and protected and notable species which occur within 2km of the Site. Data was obtained from the Lancashire Environment Record Network (LERN) as well as relevant publications, reports and online databases. These included the Multi-Agency Geographic Information for the Countryside (MAGIC), Joint Nature Conservation Committee (JNCC) and the Lancashire BAP.

2.2 Extended Phase 1 Habitat Survey

A field survey, in the form of an extended Phase 1 Habitat Survey was undertaken by a suitably qualified Ecologist on the 17th April at Hodder WTW and of the perimeter of Stocks Reservoir on the 24th April. All habitats within the site were identified and mapped in compliance with the 'Handbook for Phase 1 habitat survey: a technique for environmental audit' (Joint Nature Conservation Committee, 2010). Dominant plant species were noted, as were any protected, uncommon or invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

An assessment was also undertaken of the likely presence or absence of protected and notable animal species within the ZoI of the proposed development. This was based on the known distribution of species, habitat suitability and/or direct evidence such as field signs or observations. From these findings further protected species surveys may then be recommended and/or required. The methodologies and assessment criteria used were based on current published guidance where available. Specific assessment criteria for bats, water vole *Arvicola amphibius*, otter *Lutra lutra*, badger *Meles meles* and great crested newts *Triturus cristatus* (GCN) used in this report are given in Appendix A.

2.3 Assessment of Conservation Importance

The conservation importance was assessed for each of the main ecological features (designated sites, habitats and species) that occur within the ZoI. The following are some of the criteria that are used in the assessment of the conservation importance:

- Designation of the site;
- Rarity of the species or habitats;
- Presence of Red Data Book (RDB) or endemic species;
- Presence of diverse assemblages of plants or animals;
- Plant communities typical of natural/semi-natural habitats;
- Habitat diversity; and
- Connectivity and presence of large populations of animals which are uncommon or threatened in a wider context.

The assessment of conservation importance in this report makes reference to the geographical scale of International, National, Regional, County, Local and ZoI only (CIEEM, 2019).

2.4 Limitations

- Desk-based information, such as long term species records and information on designated sites was used to supplement the field survey and set it in context. The baseline description was based on the current field surveys, desk study data, and the professional judgement of the assessors. While records allow an overview of species present they do not record every species and therefore there is potential for species that have not been recorded to still be present.
- Direct access to edge of the reservoir was not possible for the entirety of the reservoir during the walkover. It was viewed where possible from adjacent land. It is not thought that this affects the overall results of this PEA as the majority of the land was accessed and habitats are not deemed to be significantly different from those recorded. Additionally, the previous Bowland Ecology phase 1 habitat map has been used as background information.
- Direct access to the poor semi-improved grassland to the north-east of Hodder WTW was not possible at the time of the survey but this area was viewed from the adjacent road. Given the levels of grazing it is considered that this was sufficient to allow an adequate assessment of the habitat types present. As such it is not thought to affect the results.

3 Results

3.1 Desk Study

3.1.1 Statutory designated sites for nature conservation

There are eight statutory designated sites within 2km. These are detailed below in Table 3.1.

All statutory designated sites are designated for their habitats except for the Bowland Fells Special Protected Area (SPA) which is designated for birds. Due to the locations and limited nature of the works proposed it is unlikely that any impacts will occur on or impact any features of any statutory designated sites.

The Special Area of Conservation (SAC) and SPA are deemed to be of International importance with the Sites of Special Scientific Interest (SSSI) of National importance.

Table 3.1: Summary of statutory sites for nature conservation

Site name	Designation	Minimum distance from site (approximate)	Designated features
North Pennine Dales Meadows	SAC	1.3km S	Mountain hay meadows is the primary reason for selection of the site.
Bowland Fells	SPA	1.8km W	Qualifying species of the SPA include hen harrier *Circus cyaneus*, merlin *Falco columbarius* and lesser black-backed gull *Larus fuscus*
Field Head Meadow	SSSI	1.9km SE	Herb rich hay meadow
Standridge Farm Pasture	SSSI	1.7km SE	Unimproved herb-rich flushed pasture
Bell Sykes Meadows	SSSI	1.2km S	Unimproved herb rich grassland
Bowland Fells	SSSI	1.8km W	Blanket bog, heather moorland, upland breeding birds
Myttons Meadows	SSSI	1.5km SW	Site comprises three fields which together represent the largest and best surviving example of traditionally managed, species-rich meadow grassland identified in Lancashire.
Barn Gill Meadow	SSSI	950m E	Supports two types of herb-rich neutral grassland in which over 73 species of plants have been recorded

Source: MAGIC and LERN.

3.1.2 Non-statutory designated sites for nature conservation

There are 32 non-statutory designated sites within 2km, two are within the Site which include Stocks Reservoir Biological Heritage Site (BHS) and the River Hodder BHS which may be affected by the works. Non-statutory designated sites which are in the vicinity of the works are mapped in Appendix F.

All are deemed to be of Local importance and are summarised in Table 3.2.

Table 3.2: Summary of non-statutory sites for nature conservation

Site name	Designation	Minimum distance from site	Designated features
Barn Gill Meadows	Biological Heritage Site (BHS)	300m S	Semi-natural neutral grassland.
Barn Gill Valley Grasslands	BHS	650m E	Semi-natural neutral grassland
Bottoms Beck (upper section)	BHS	1.2km NE	Rich neutral grassland and swamp
Bottom Laithe	BHS	750m E	Species-rich, calcicolous flush vegetation
Collyholme Wood	BHS	1.5km NW	Ancient semi-natural woodland with scrub.
Copped Hill Pasture	BHS	1.5km NW	Mire vegetation – grassland, swamp and fen, flowering plants and ferns
Dale Head Churchyard	BHS	450m E	Species-rich semi-natural grassland and acid grassland
Dale House Pasture	BHS	1.6km N	Species-rich grassland
Dugdale Syke Pastures	BHS	1.3km E	Semi-natural neutral grassland
Grassland, Hole House Lane	BHS	140m E	Species-rich grassland
Hole House Lane (North) Roadside Verge	BHS	Adjacent E	Species rich roadside verge
Hole House Lane (South) Roadside Verges	BHS	700m E	Species-rich roadside verge
Hollins Hollow	BHS	300m W	Damp neutral grassland
Lower Highfield Grassland	BHS	1.7km SE	Species-rich sward of grassland
New House Flushes	BHS	350m NW	Wet grassland, flushes, swamps
Pages Front Meadow	BHS	1.7km SW	Damp, species-rich neutral grassland
Park Wood – Bottoms Beck	BHS	Directly adjacent to the E	Semi-natural woodland
Phynis Beck, Slaidburn	Local Geodiversity Site (LGS)	200m W	No citation
Poorhill Pasture	BHS	1.85km SW	Small areas of acidic and neutral grassland with rushes. Grassland
Poorsland Meadow	BHS	1.9km S	Semi-natural neutral grassland
Poorsland's Pastures	BHS	1.8km S	Species-rich semi-natural neutral grassland
Proctors Cow Pasture	BHS	1.9km SW	Species-rich neutral grassland with base-rich flushes. Grassland, swamp and fen
Mellows Meadow, Bell Sykes	BHS	1.7km S	Species-rich grassland
River Hodder	BHS	Within Site	Fish species, otter, river banks lined with woodland.
Roadside Verge, Wood House Gate, Slaidburn – Bentham Road	BHS	400m SW	Upland hay meadows and wet woodland
Roadside Verge, Wood House Gate, Slaidburn – Bentham Road	BHS	600m W	Flowering plants
Shay Wood and Lent Bank Wood	BHS	1.7km SW	Semi-natural woodland with woodland flora such as dog's mercury, bluebell, wood anemone, lords and ladies.
Slaidburn – Tosside Road Verge (East)	BHS	2km E	The verge is species-rich
Spencer Meadow	BHS	1.7km W	Semi-natural neutral and acid grassland

Stocks Reservoir	BHS	Within Site	Adder, wildfowl and waders, inundation vegetation
The Skaithe Grasslands	BHS	1.1km SW	Species-rich semi-natural grassland.
Top Hebor and Farther Laithe Grasslands	BHS	1.1km SE	Species rich neutral grassland

Source: LERN

3.2 Extended Phase 1 Habitat Survey

There were 17 habitats which were recorded within the ZoI. These were broadleaved semi-natural woodland, broadleaved plantation woodland, coniferous plantation woodland, scattered broadleaved trees, scrub, semi-improved grassland, improved grassland, marshy grassland, poor semi-improved grassland, amenity grassland, inundation vegetation, standing water, running water, species-poor intact hedgerow, bare ground, buildings and hardstanding.

The locations of all habitats are shown on the Phase 1 habitat map in Appendix B, with associated Target Notes and photographs in Appendix C. Target Notes are referred to as TN1, TN2 etc. in the following section.

3.2.1 Broadleaved semi-natural woodland

Broadleaved semi-natural woodland is present within the Hodder WTW and the surrounding landscape of Stocks Reservoir.

Tree species within the woodland include alder *Alnus glutinosa*, sycamore *Acer pseudoplatanus*, silver birch *Betula pendula*, hawthorn *Crataegus monogyna,* ash *Fraxinus excelsior* and willow *Salix sp*.

The understorey comprised dog's mercury *Mercurialis perennis*, ramsons *Allium ursinum*, English bluebells *Hyacinthoides non-scripta*, bramble *Rubus fruticosus,* red campion *Silene dioica* and primrose *Primula vulgaris* adjacent to the River Hodder and the brook to the south of Hodder WTW. Dog's mercury, ramsons, bluebell and primrose are all indicators of ancient woodland.

Additionally, there is an area of scrub with soft rush *Juncus effusus* within the woodland at Hodder WTW (TN 1) which was too small an area to map. This is likely to be wet due to poor drainage as it is located on what appears to be an old spoil heap.

The woodlands are not designated as ancient woodland on Magic (https://magic.defra.gov.uk/). Hodder Woodlands are listed under the Lancashire BAP habitat: Broadleaved and Mixed Woodland as an upland ash woodland. The exact location of Hodder Woodlands is unknown, therefore as ash is present within the woodland it is assumed, as a precautionary approach, that the broadleaved semi-natural woodland is part of the Lancashire BAP.

Broadleaved semi-natural woodland is of Local importance and will not be impacted as part of the works.

3.2.2 Broadleaved plantation woodland

To the north of Hodder WTW there are areas of broadleaved plantation woodland. This includes species such as ash, alder, beech *Fagus sylvatica,* oak *Quercus robur*, hawthorn, willow, hazel *Corylus avellana* and rowan *Sorbus aucuparia*. Ground flora comprises species such as common nettle *Urtica dioica*, creeping buttercup *Ranunculus repens* and Yorkshire fog *Holcus lanatus*.

An area of young to semi-mature silver birch will be removed as part of the works (TN 2) for the new rapid gravity filter.

Broadleaved plantation woodland is of Local importance and the area to the north of Hodder WTW will require removal as part of the works.

3.2.3 Coniferous plantation woodland

Coniferous plantation woodland is present between the reservoir spillway and the embankment to the south of Stocks reservoir and the north east of Hodder WTW.

It is of Local importance and will not be impacted as part of the works.

3.2.4 Scattered broadleaved trees

Four alder trees are present within the grassland to the north west of Hodder WTW. Additionally, scattered small-leaved lime *Tilia cordata* and sycamore trees are present on the existing access road into Hodder WTW. These trees could not be surveyed directly but will not be affected by the works.

Scattered broadleaved trees are of Local importance and will not be removed as part of the works.

3.2.5 Scrub

Willow *Salix sp.* scrub is present on the islands within Stocks Reservoir. A more detailed species list could not be compiled due to lack of access to the islands but this species was identified using binoculars. It is likely that the islands used to be less vegetated but tree species have increased due to lack of grazing.

Scrub is of Local importance and will be impacted as part of the enhancements on the island as part of the works.

3.2.6 Semi-improved neutral and acid grassland

Semi-improved grassland is present adjacent to Stocks Reservoir. There is both neutral and acid grassland present based on species composition around the reservoir. It comprises Yorkshire fog, dock *Rumex sp.*, cock's foot *Dactylis glomerata*, yarrow *Achilllea millefolium*, common nettle, bracken *Pteridium sp.,* silverweed *Argentina anserina*, creeping buttercup, perennial ryegrass *Lolium perenne* and some common hogweed *Heracleum sphondylium*. Additionally, smaller patches of soft rush are present.

Semi-improved grassland is of Local importance. This will be impacted as part of the Scheme.

3.2.7 Improved grassland

There is an area of improved grassland to the south east of Hodder WTW. It is grazed by sheep but access at the time of the walkover of Hodder WTW was not available. Therefore, it was viewed from the Hodder WTW and a species list could not be compiled.

Improved grassland is of ZoI importance and will not be affected by the works.

3.2.8 Marshy grassland

Marshy grassland is present around Stocks Reservoir and to the west of the embankment.

It predominantly comprises soft rush, mosses and reed canary grass *Phalaris arundinacea*.

Marshy grassland is of Local importance. It is likely that due to the temporary drawdown and permanent raising of the water levels following the works that this habitat will be temporarily

impacted by the works. The area between the woodland and the reservoir embankment will be temporarily removed for the works.

3.2.9 Poor semi-improved grassland

Poor semi-improved grassland is present to the north west of Hodder WTW. Access to the area was not possible directly at the time of the survey, so a list of plant species could not be compiled. The area appears to have a low ecological diversity. The grassland was frequently grazed by sheep, so the sward was short with scattered thistle *Cirsium sp.* and common nettle.

This area will be used for stockpiling soil and for tree planting following the works. It is of ZoI importance.

3.2.10 Amenity grassland

Amenity grassland is present around the majority of Hodder WTW and the embankment of Stocks Reservoir. It is regularly maintained through mowing and comprises mosses, dandelion *Taraxacum officinale*, thistle *Cirsium sp.*, perennial rye grass, daisy *Bellis perennis*, self-heal *Prunella vulgaris*, white clover *Trifolium repens,* red clover *Trifolium pratense*, birds foot trefoil *Lotus corniculatus*, yarrow, ribwort plantain *Plantago lanceolata* and dock.

Amenity grassland is of ZoI importance. Small areas of amenity grassland may require removal within the WTW.

3.2.11 Inundation vegetation

Inundation vegetation is present around Stocks Reservoir at the water line and on exposed ground where the reservoir inundates during its normal fluctuations. Species include water mint *Mentha aquatica* and forget-me-not *Myosotis sp*.

Inundation is of Local importance. It is likely that due to the temporary drawdown and permanent raising of the water levels following the works that this habitat will be temporarily impacted by the works.

3.2.12 Standing water

Stocks Reservoir is a large standing water body with rocky habitat around it. The reservoir was historically (10 to 15 years ago - pers comm UU Ecologist) higher than it is now and is still subject to large fluctuations in water levels identified from tide lines on the banks.

One standing water body was recorded to the north of Hodder WTW (Pond 3b on the maps). It was approximately 1.5m^2 present on a ditch.

Standing water is of Local importance. While the capacity of standing water within Stocks Reservoir will be temporarily reduced during the works and increased at operation this will not impact the habitat itself. No other standing water will be affected as part of the works.

3.2.13 Running water

There are a number of ditches and the River Hodder within the Site. The River Hodder is relatively shallow and stony adjacent to the WTW with canalised edges. Downstream of the WTW it widens and deepens with earth banks.

The River Hodder is designated as a BHS (Section 3.1.2) and is part of the Lancashire BAP habitat: Rivers and Streams.

Running water is of Local importance. Running water will not be directly affected by the works.

3.2.14 Species-poor intact hedgerow

A beech hedgerow is present on the existing access road to the north-west of Hodder WTW. Due to the lack of species diversity (less than four native woody species) it does not qualify as an important hedgerow under the Hedgerow Regulations 1997. However this hedgerow does meet the criteria for classification as a habitat of principle importance under Section 41 of the NERC Act .

Species-poor intact hedgerow is of Local importance. A part of the hedgerow will be removed for access (80.4m).

3.2.15 Buildings

There are a number of buildings within the Hodder WTW. These consist of a combination of stone buildings with pitched and flat felt roofs, metal buildings and concrete tanks. These are described further in Section 3.5.2 below. Building 1 will be impacted by the works. The remaining buildings will not be directly impacted by the works.

Buildings are of ZoI importance. Building 1 will be directly affected by the works. No other buildings will be.

3.2.16 Hardstanding

Hardstanding in the form of roads is present around the WTW and will be impacted by the works.

Hardstanding is of ZoI importance. Hardstanding will not be impacted by the works.

3.3 Protected and Notable Plant Species

Within 2km of the Site there are 44 records of English bluebell. The closest record is within the Site boundary within the broadleaved semi-natural woodland adjacent to the north of Stocks Reservoir.

English bluebells were recorded within the broadleaved semi-natural woodland to the north of Stocks Reservoir during the site walkover.

English bluebell is listed under Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) which protects them from sale.

English bluebell is of Local importance and will not be impacted by the works

3.4 Invasive Non-native Plant Species

No invasive species were recorded to be present on or around the Site during the walkover surveys.

Seven New Zealand pigmyweed *Crassula helmsii* records exist within 2km of the Site including within Stocks Reservoir. Additionally, the species was recorded in 2014 during the previous walkover within the reservoir.

Eight Indian balsam *Impatiens glandulifera* records are present within 2km of the Site. The nearest record exists 250m south of Stocks Reservoir at Black House.

New Zealand pigmyweed and Indian balsam are both listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). It is therefore an offence to plant or otherwise cause to grow in the wild invasive non-native plants listed.

Invasive non-native plant species are of ZoI importance.

3.5 Protected and Notable Animal Species

3.5.1 Breeding, wintering and migratory birds

Vegetation such as trees and scrub provide suitable habitat for breeding birds. The shore of Stocks Reservoir and the islands provide suitable habitat for breeding, wintering and migratory waders and wildfowl.

There are 505 records of birds within 2km of the Site which cover 68 species. There are 10 species listed on Schedule 1 of the Wildlife and Countryside Act 1981, 19 on S41 of the NERC Act and 3 listed on the Lancashire BAP. A summary of these are presented in Table 3.3 below.

Additionally, a number of species have been recorded on and adjacent to Stocks Reservoir through breeding bird surveys in 2014 (Bowland Ecology, 2014) and a number of species have been recorded using the reservoir within the local records. These primarily consist of wildfowl and waders.

A sand martin bank was recorded to the north of Stocks Reservoir during surveys in 2014 (TN 3), but no evidence of a suitable bank or holes was recorded during the site visit. It is possible that the bank has slipped since the previous surveys.

A bird box was recorded to the north of the WTW (TN 4). A number of birds nests were recorded within the woodland the east of the WTW which will not be affected by the works and nest were recorded within the broadleaved plantation woodland to be removed.

Table 3.3: Summary of bird species records returned and their protection within a 2km radius of the Site

Species	No. of Records	Most Recent Record	Legislation	Description
Hen harrier *Circus cyaneus*	3	2000	Schedule 1 of Wildlife and Countryside Act 1981 (as amended). Lancashire BAP	Recorded in the Ribble valley
Little ringed plover *Charadrius dubius*	4	2001	Schedule 1 of Wildlife and Countryside Act 1981 (as amended)	Recorded breeding at Stocks Reservoir
Mediterranean gull *Laurus melanocephalus*	8	2002	Schedule 1 of Wildlife and Countryside Act 1981 (as amended)	Recorded breeding at Stocks Reservoir
Whooper swan *Cygnus cygnus*	1	1979	Schedule 1 of Wildlife and Countryside Act 1981 (as amended)	Recorded at Stocks Reservoir
Merlin *Falco columbarius*	1	1998	Schedule 1 of Wildlife and Countryside Act 1981 (as amended)	Recorded breeding
Peregrine *Falco peregrinus*	1	1998	Schedule 1 of Wildlife and Countryside Act 1981 (as amended)	Recorded breeding

Species	No. of Records	Most Recent Record	Legislation	Description
Fieldfare *Turdus pilaris*	1	1987	Schedule 1 of Wildlife and Countryside Act 1981 (as amended)	No information provided
Barn owl *Tyto alba*	4	2012	Schedule 1 of Wildlife and Countryside Act 1981 (as amended)	Breeding in the Ribble Valley
Crossbill *Loxia curvirostra*	1	1988	Schedule 1 of Wildlife and Countryside Act 1981 (as amended)	Recorded in the Ribble Valley
Garganey *Anas querquedula*	1	1998	Schedule 1 of Wildlife and Countryside Act 1981 (as amended)	No information provided
Skylark *Alauda arvensis*	13	2013	S41 of the NERC Act Lancashire BAP	Recorded breeding at Merrybent Hill
Reed bunting *Emberiza schoeniclus*	4	2000	S41 of the NERC Act	Recorded breeding
Herring gull *Larus argentatus*	2	1998	S41 of the NERC Act	Recorded breeding at Stocks Reservoir in 1997
Cuckoo *Cuculus canorus*	6	2000	S41 of the NERC Act	Breeding at Merrybent Hill
Grasshopper Warbler *Locustella naevia*	11	2004	S41 of the NERC Act	Recorded breeding at Stocks Reservoir in 1998
Yellow wagtail *Motacilla flava*	1	2005	S41 of the NERC Act	No information provided
Spotted flycatcher *Muscicapa striata*	24	2005	S41 of the NERC Act	Proved breeding at Merrybent Hill and Catlow
Curlew *Numenius arquata*	45	2014	S41 of the NERC Act	Recorded breeding in the Ribble Valley
Tree sparrow *Passer montanus*	2	2004	S41 of the NERC Act	No information provided
Grey partridge *Perdix perdix*	11	2005	S41 of the NERC Act	Recorded breeding
Wood warbler *Phylloscopus sibilatrix*	5	2004	S41 of the NERC Act	No information provided
Marsh tit *Poecile palustris*	7	2004	S41 of the NERC Act	Probable breeding at Stocks Reservoir and Bottoms Beck
Dunnock *Prunella modularis*	8	2009	S41 of the NERC Act	Breeding at Merrybent Hill
Bullfinch *Pyrrhula pyrrhula*	3	2000	S41 of the NERC Act	Recorded breeding
Starling *Sturnus vulgaris*	13	2018	S41 of the NERC Act	Recorded in the Ribble Valley breeding
Black grouse *Tetrao tetrix*	1	1982	S41 of the NERC Act	Hollins Moor
Song thrush *Turdus philomelos*	9	2000	S41 of the NERC Act Lancashire BAP	Breeding at Merrybent Hill
Ring Ouzel *Turdus torquatus*	4	2005	S41 of the NERC Act	Recorded within the Ribble Valley
Lapwing *Vanellus vanellus*	39	2013	S41 of the NERC Act Lancashire BAP	Recorded breeding in the Ribble Valley

Source: LERN

All wild birds, their nests and eggs are protected under the Wildlife and Countryside Act 1981 (as amended). It is an offence to take, damage or destroy the nest of any wild bird while it is in use or being built. In addition, species listed on Schedule 1 of the same act are afforded additional protection from disturbance whilst breeding.

Breeding birds are considered to be of Local importance, except those listed on Schedule 1, which are of National importance. Breeding birds may be affected by the increase of the water level within the reservoir.

3.5.2 Bats

There are a number of bat species recorded within 2km of the Site. None are located within the Site itself. These are summarised in Table 3.4 below

Table 3.4: Historical records of bats recorded within 2km of the Site

Common name	Scientific name	Number of records	Location	Most recent record	Comments
Brandt's bat	*Myotis brandtii*	2	Belle Syke, Farm, Slaidburn	1990	70+ counted
Daubenton's bat	*Myotis daubentonii*	5	Over the River Hodder, possible roost in the bridge	2009	20 counted
Natterer's bat	*Myotis nattereri*	1	Unknown	2010	Bat roost
Pipistrellus bat species	*Pipistrellus*	2	Bell Sykes Farmhouse, Slaidburn	2014	Day roost Count of 18
Brown long-eared bat	*Plecotus auritus*	1	Bell Sykes Farmhouse, Slaidburn	2014	Day roost Count of 1

Source: LERN

An external assessment of the buildings on Site was undertaken as well as internal inspection of Building 2. The results of this survey are detailed below and follow the Bat Conservation Trust Guidelines detailed in Appendix A.

Table 3.5: Bat Roosting Potential in Buildings

Building no	Description	Suitable Features	Evidence of Bat Presence	Bat Roost Potential	Previous surveys	Photographs
1	Filter house and main administration building. Stone building with a pitched roof. Some lighting on NW face. Relatively good condition.	Gap under slate tile where it joins the side of the soffit box on NW side. Cobwebs noted.	None	Low	No previous surveys undertaken	

Building no	Description	Suitable Features	Evidence of Bat Presence	Bat Roost Potential	Previous surveys	Photographs
2	Brick building with large gaps under soffit boxes. Additional metal roof located over previous flat felt roof.	Gap between wooden soffit boxes and building.	Pipistrelle bat recorded inside of the Chlorine store on the north internal wall. Large amounts of bat droppings recorded both internally and externally.	Confirmed	Maternity roost for predominantly soprano pipistrelle recorded in 2014. Maximum count of 489 bats.	
3	Brick bulging directly connected to Building 2. with soffit boxes and a corrugated metal roof.	Gaps in wooden soffit boxes.	None	High	No surveys undertaken	
4	Brick building with a pitched slate roof.	Some loose slate tiles creating gaps	None	Low	No previous surveys undertaken	
5	Metal building with machinery inside.	None	None	Negligible	No previous surveys undertaken	No photo available

Building no	Description	Suitable Features	Evidence of Bat Presence	Bat Roost Potential	Previous surveys	Photographs
6	Stone building with glass panels on top. To the NE of the building is a one storey brick built part with a flat felt roof.	Gap around the doors, windows and under the felt roof.	One bat dropping recorded internally in the SE corner.	High	10 soprano pipistrelles and *Myotis* bats recorded emerging in 2014.	
7	A metal silo on a breeze block base.	None	None	Negligible	No previous surveys undertaken	No photo available
8	Metal and stone building in good condition	None	None	Negligible	No previous surveys undertaken	
9	Metal and stone building in good condition.	None	None	Negligible	No previous surveys undertaken	

Building no	Description	Suitable Features	Evidence of Bat Presence	Bat Roost Potential	Previous surveys	Photographs
10	Stone building with a pitched slate roof. Light to the SE face of the building.	There are gaps between the roof and the building. Gaps behind the soffit boxes.	None	High	Historical satellite roost for bats. No roost recorded in 2014.	
11	Metal and stone building with extractor vents. Lights on sides of the building.	Gap between gutter and pitched roof.	None	Negligible	No previous surveys undertaken	
12a	Small metal structure operating machinery and storing equipment	None	None	Negligible	No previous surveys undertaken	No photo available
12b	Small metal structure operating machinery and storing equipment	None	None	Negligible	No previous surveys undertaken	No photo available
12c	Small metal structure operating machinery and storing equipment	None	None	Negligible	No previous surveys undertaken	No photo available

Source: Mott MacDonald, 2019

All trees within the Site boundary that were thought to be affected or adjacent to the works were assessed for their potential to support roosting bats. The results of which can be found below in Table 3.6 and follow the Bat Conservation Trust Guidelines detailed in Appendix A.

Table 3.6: Trees with bat roosting potential

TN	Species	Condition	Features Suitable for Roosting Bats	Evidence of Roosting Bats	BCT Tree Category (Collins et al 2016)
4	Oak	Reducing vitality - possibly due to age/environment. Minor dead wood and old branch stumps.	Seven callus rolls noted on the SE face approximately 3m, 4m, 6m and 7m from the ground.	None	Moderate

Source: Mott MacDonald, 2019

The tree with bat roosting potential (TN 4) will not be affected through the proposed works therefore no bats roosting within trees will be impacted.

All bat species are protected under the Conservation of Habitat and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act 1981 (as amended). In summary it is an offence to intentionally or deliberately kill, injure, disturb or capture any bats or damage, destroy or obstruct access to any structure used for breeding or resting by them. Seven species are also listed on Section 41 of the NERC Act 2006 and the Lancashire BAP.

Bats are of International importance and could be affected by the works at the WTW through disturbance.

3.5.3 Otter

There are 10 records of otter within 2km of the Site. None are located within the Site itself but there are numerous records on the River Hodder downstream of the WTW and one record is present upstream on the river upstream of Stocks Reservoir.

A number of otter spraints and suitable resting sites were recorded around the reservoir. The locations of these are presented in Appendix G. To the west of the reservoir (TN 5) is a large rock which is used by otter and in close proximity are a number of holes in the reservoir bank where otter spraints were recorded at the entrance. Additionally, it is likely that the islands are used by otter for resting sites. Otter are also part of the designation of the River Hodder BHS. Otter are therefore likely to be using the River Hodder for commuting and foraging and feeding within Stocks Reservoir.

Otter is protected under the Conservation of Habitat and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act 1981 (as amended). In summary it is an offence to intentionally or deliberately kill, injure, disturb or capture otters or damage, destroy or obstruct access to any structure used for breeding or resting. Otters are also listed on Section 41 of the NERC Act 2006 and are under the Lancashire BAP.

Otters are of International importance. Currently high water levels, especially in winter, mean that any identified resting places on the reservoir shores are subject to inundation. Therefore, it is unlikely that otters will be impacted by the Scheme.

3.5.4 Water vole

No records of water vole are present within 2km of the Site.

The reservoir is unsuitable for water vole due to the banks which are rocky and at a gentle slope therefore not suitable for burrowing. Additionally, there is a lack of suitable food material for them within the reservoir and is a very large deep waterbody.

The River Hodder adjacent to the WTW is canalised and very shallow with little vegetation for feeding material and cover. Further downstream it widens, deepens and comprises earth banks with broadleaved semi-natural woodland on the right bank and improved grassland on the left bank. It is considered due to the size and depth of the watercourse downstream in combination with the lack of records that it is unlikely that they are present and will not be considered further in this report.

3.5.5 Badger

PLEASE NOTE CONFIDENTIAL INFORMATION HAS BEEN REMOVED FROM THIS SECTION

3.5.6 Other mammals

One hazel dormouse *Muscardinus avellanarius* record from 1993 exists 1.6km east of the reservoir. Due to the age and distance of the record, as well as the lack of hedgerows on site and condition and species of the woodlands within the Site it is not considered likely that they will be present within the Site and are not considered further in this report.

There are 26 brown hare *Lepus europaeus* records within the surrounding landscape of the Site. The nearest is within 100m north of the reservoir. Brown hare were recorded on grassland around the reservoir including a leverett and within the WTW.

Two roe deer *Capreolus capreolus* were recorded to the north of the reservoir during the site visit (TN 6), and one roe deer and deer slots were recorded to the north of the WTW (TN 7).

Three hedgehog *Erinaceus europaeus* records are 1.5km south of the Site. The woodlands provide suitable habitat for hedgehogs.

Brown hare, hedgehog and roe deer are protected against cruelty under the Wild Mammals Act 1996. Additionally brown hare and hedgehog are listed under S41 of the NERC Act 2006 and the Lancashire BAP.

One mink *Neovison vison* record was recorded 1.5km south-west on Croasdale Brook. The River Hodder provides suitable habitat for mink. Mink are listed are Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), therefore it is an offence to release them.

Brown hare and hedgehog are of Local importance. Mink and roe deer are of ZoI importance. Other mammals could be affected by the works at the WTW through lighting and entrapment.

3.5.7 Great crested newts

Three records of GCN are present 850m east of the north of Stocks reservoir, this is over 3km from the WTW.

The Reservoir due to its size, depth and waterfowl presence is unsuitable for GCN.

Ponds within 250m were identified for great crested newts (GCN) based on a desk study of aerial and OS maps, as well as a previous report (Bowland Ecology, 2014). 250m was deemed a large enough distance due to the lack of records of GCN and presence of woodland and trees surrounding the Site.

Pond numbers have been kept the same as the previous amphibian report in 2014 to ensure consistency. Their locations can be found in Appendix B. Ponds 1, 2, 3a and 3c were recorded as dry during the site visit in April. Pond 3b was found to be poor suitability for GCN (Table 3.7) following the HSI (Oldham et al, 2000). Pond 4, which was previously recorded with amphibians in 2014, has since had works undertaken so that it is no longer an open tank which amphibians

could enter. Therefore, it is no longer counted as a waterbody. A breakdown of the HSI for Pond 3b can be found in Appendix D.

Table 3.7: Habitat Suitability Index of water bodies for great crested newts within 250/500m of the site.

Water body No.	HSI Score	Pond suitability	Photograph
1	Dry	N/A	
2	Dry	N/A	
3a	Dry	N/A	

3b	0.38	Poor	
3c	Dry	N/A	
4	No access points	N/A	

Source: Mott MacDonald, 2019.

GCN are therefore not considered to be present within the Site and will not be considered further in this report.

3.5.8 Common amphibians

There is one toad *Bufo bufo* record from 1977 to the north of the reservoir. There are six records within 2km of common frog *Rana temporaria* with the closest located on Bottoms Beck. Additionally, a toad was recorded to the north of the reservoir during the walkover (TN 8) and a

toadlet was recorded adjacent to Building 6. It is likely that common amphibians breed within the watercourses surrounding Stocks reservoir and potentially Stocks Reservoir. Pond 3b would provide a small area for breeding and there is suitable terrestrial habitat within the Site.

Common amphibians are protected from sale under the Wildlife and Countryside Act 1981 (as amended) and common toad are listed on S41 of the NERC Act 2006.

Common toad is of Local importance and common frog is of ZoI importance and are unlikely to be affected by the works.

3.5.9 Widespread reptiles

There are 30 common lizard *Zootoca vivipara* recorded within 2km of the Site. All records are present within the woodland to the north of Stocks Reservoir. It can therefore be assumed that they are present within the surrounding landscape.

The woodland, marshy grassland and semi-improved grassland around Hodder WTW has suitability for common reptiles. Suitable hibernacula were recorded around the Site including rock and log piles.

Common reptiles are afforded partial protection under the Wildlife and Countryside Act 1981 (as amended). In summary it is offence to intentionally kill or injure any of these species. All widespread reptiles are also listed on Section 41 of the NERC Act 2006. Grass snake *Natrix helvetica*, common lizard and adder *Vipera berus* are listed on the Lancashire BAP.

While reptiles are assumed to be present they are unlikely to be affected by the works due to the habitats to be directly impacted. They are of National importance.

3.5.10 White-clawed crayfish

There are no white-clawed crayfish *Austropotomobius pallipes* records present within 2km of the Site. The reservoir and the River Hodder are unlikely to provide suitable habitat due to the size and acidic nature of the surrounding landscape. Additionally, if white-clawed crayfish were present they would not be impacted by the works as they would not be removed from the water course. Therefore white-clawed crayfish will not be considered further in this report.

3.5.11 Invertebrates

There are 107 records over 12 species of invertebrates within 2km of the Site.

Five species are listed on the Lancashire BAP which include the dark green fritillary *Argynnis glaja, Geomyza majusula*, brimstone *Gonepteryx rhamni*, chimney sweeper *Odezia atrata* and willow ermine *Yponomeuta rorrella*.

It is likely that terrestrial invertebrates are present within the Site at the WTW and the habitats adjacent to the reservoir. Habitats to be removed within the WTW include amenity grassland and broadleaved plantation woodland. Should terrestrial invertebrates be present within the habitats to be removed on Site there is suitable alternative habitat within the vicinity.

Aquatic invertebrates are likely to be present within the River Hodder and Stocks Reservoir. These are unlikely to be affected by the proposed works as there are just changes in water levels in the reservoir.

Invertebrates are of Local importance and due to the works which are proposed it is not considered that terrestrial or aquatic invertebrates would be detrimentally affected.

3.5.12 Fish

There are 189 records of fish over seven species within 2km of the Site (these are summarised below in Table 3.8). The records are located within the River Hodder but it is also know that Stocks Reservoir is regularly fished and subsequently stocked with fish.

Table 3.8: Summary of fish records returned and their protection within a 2km radius of the Site

Species	No. of Records	Most Recent Record	Legislation
Brook lamprey *Lampetra planeri*	1	1953	
Bullhead *Cottus gobio*	46	2015	
European eel *Anguilla anguilla*	30	2015	The Eels (England and Wales) Regulations 2009 S41 NERC
Rainbow trout *Oncorhynchus mykiss*	1	2000	Non-native
Atlantic salmon *Salmo salar*	38	2015	Salmon and Freshwater Fisheries Act 1975 S41
Brown trout *Salmo trutta*	71	2015	Salmon and Freshwater Fisheries Act 1975 S41
Grayling *Thymallus thymallus*	2	2013	

Salmon *Salmo salar* and brown trout *Salmo trutta* are listed on the Salmon and Freshwater Fisheries Act 1975 which, in summary (but not limited to) prohibits obstruction to fish passage and the destruction of spawning habitat.

The Eels (England and Wales) Regulations 2009 prohibits the obstruction to fish passage.

Fish are unlikely to be impacted by the works but are of County importance.

4 Interpretation and Recommendations

4.1 Further surveys

Based on the results of the PEA the following surveys are recommended in order to determine the presence/likely absence and/or population status of protected and notable species within the site/ZoI. This information will be used to inform more detailed mitigation and/or potential licencing requirements for protected species should they be adversely affected by the proposed development. Further mitigation for these receptors will be included within the relevant reports and will not be include in Section 4.2.

- A National Vegetation Classification (NVC) survey of the inundation vegetation around the reservoir should be undertaken to understand species present and to assess the impact on Stocks Reservoir BHS resulting from the works.
- Breeding bird surveys to understand how the raising of the water levels may impact the Stocks Reservoir BHS. A review of overwintering and migratory birds will also be included within the subsequent report. Due to a large amount of data (which will be included within the bird report) it is not considered at this time that separate overwintering bird surveys are required.
- Bat emergence surveys on the confirmed roost, three high buildings and two low buildings. These will be undertaken in line with the BCT guidelines (Collins et al. 2016) where one survey will be undertaken on the low building between May and August and three surveys (consisting of at least one dusk and one separate dawn survey) will be undertaken between May and September with at least two being undertaken between May and August.
- A bat activity survey should be undertaken once per month between June and August to understand whether any important foraging or commuting corridors will be affected for the maternity roost in Building 2.

4.2 Mitigation

The following mitigation measures must be implemented in order to comply with planning and legislative requirements.

- Roadside verge, Bentham Road BHS will be fenced off from the road to ensure that any construction vehicles do not impact the habitats for which this site is designated.
- Any trees to be removed shall be replaced at a minimum of 2:1.
- Any habitats to be removed shall be reinstated or re-created as a minimum on a like for like basis.
- Deer fencing, or suitable equivalent, will be required for some areas of new habitat and tree planting. This will be assessed and shown on the landscape drawings which are submitted as part of this application.
- Trees should be removed between September and February. If this is not possible a nesting bird check should be undertaken no more than 48 hours prior to the clearance. Should any nests be found a demarcation zone will be implemented where no works can take place until the chicks have fledged.
- Due to the presence of New Zealand Pigmyweed it is recommended that a biosecurity method statement is required for any works within the spillway. No works are to take place directly within the River Hodder or Stocks Reservoir.

- Any lighting that occurs will need to be directional away from the River Hodder and vegetation used by mammals including woodland and areas of grassland.
- PLEASE NOTE CONFIDENTIAL INFORMATION HAS BEEN REMOVED FROM THIS SECTION
- Due to the potential presence of mammals such as deer moving through the site any excavations should be covered overnight or a plank should be placed inside at a 45°.
- Any grass to be removed between March and October should be phased cut which includes cutting it to 15cm and leaving it overnight or hand searched by an Ecologist prior to clearing it to ground level.
- Should the vegetation removal within the woodland (TN 3) occur between October and March then a survey to move any potential hibernacula from the works area should occur prior to October. This is to ensure that reptiles will not be affected.
- Any ground flora removal within the woodland may affect hedgehogs therefore contractors should be made aware of their potential presence.
- Good practice pollution prevention methods should be implemented such as CIRIA Control of water pollution from construction sites: Guidance for consultants and contractors (C532).

4.3 Enhancements

The following enhancement measures are being implemented in order to provide no net loss for biodiversity, as required under the NPPF 2018.

- Enhancement for breeding birds will include clearance of scrub on the island to increase the habitat available for breeding birds and plant with soft rush *Juncus effuses* following recommendations from UU and RSPB personnel in Stocks House.
- Planting of wildflower mix and species rich grassland around the WTW instead of amenity grassland to increase the invertebrate diversity and food for bats. This will require a change in management of the grassland, such as using a twice annual cut (once in spring, and once after seed set) to encourage wild flower species diversity.

5 References

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Appendices

A. Summary of Assessment Methods

Bats

All trees within the Site with the potential to support roosting and foraging bats were assessed using the 'Bat Surveys Good Practice Guidelines' (Collins 2016). Trees and other structures were categorised using the criteria outlined in Table A.1

Table A.1: Structures and trees criteria for roosting bats

Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation) A tree of sufficient size and age to contain potential roosting features but with none seen from the ground or features seen with only very limited roosting potential	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to know roosts.

Source: Collins, 2016

Great crested newts

All water bodies within the zone of influence were assessed for their suitability to support great crested newts using a Habitat Suitability Index based on Oldham et al, 2000 and ARG UK, 2010. This method categorises 10 variables known to influence the occurrence of great crested newts. An index score of these variables is then calculated in order to assess their likely presence. It should be noted that this method should be regarded as indicative and any recommendations for further surveys are given following precautionary principles unless significant supporting evidence indicates the presence of great crested newts is unlikely.

Table A.3: Habitat Suitability Index categories for the assessment of waterbodies for great crested newts.

HSI score	Pond suitability	Likely occurrence of great crested newts
<0.5	Poor	3%
0.5 – 0.59	Below average	20%
0.6 – 0.69	Average	55%
0.7 – 0.79	Good	79%
>0.8	Excellent	93%

Source: Oldham et al, 2000 and ARG UK, 2010.

Badger

The Site was surveyed for badgers following the methodology outlined by Harris, Creswell and Jefferies (1991). The search covered all land within the Site, and up to 30m potential impact zone beyond the boundaries. Any evidence or suitable habitat was target noted. Evidence of badger presence includes:

- Setts (which were classified as main, annex or outlier);
- Latrines or droppings;
- Paths, push-throughs or trackways;
- Hairs;
- Footprints;
- Snuffle pits;
- Scratching posts; and
- Feeding remains.

Otter

The Site was surveyed for any watercourses present, and any within 30m, that had otter suitability and any potential habitats for holts along with any field signs present which were target noted. Evidence of otter includes:

- Spraints;
- Footprints;
- Anal jelly;
- Paths in vegetation;
- Flattened vegetation;
- Holts (natal holt, where female otter gives birth, nursery holt where a female otter brings her cubs from inland to the sea), hovers (lay-up sites where otters rest in shelter out of weather, between foraging periods or other exploratory outings) and couches (this is a feature, roughly circular or oval in shape, about a metre in diameter, normally of grass, which is formed by a otter resting up in the same grassy place) ; and
- Feeding remains.

Water Vole

Any watercourses within the Site, and up to 30m, were surveyed for water vole suitability and any field signs following the methodology outlined in the Water Vole Conservation Handbook (Strachan et al. 2011). Evidence of water voles include:

- Burrows;

- Latrines;
- Feeding remains;
- Footprints; and
- Runs in vegetation.

Evidence of American mink was also searched for during the survey including any footprints or droppings.

B. Extended Phase 1 Survey Map

C. Target Notes and Photographs

Table C.2: Phase 1 Habitat Survey Target Notes

Target Note (TN)	Details	Photo
1	Scrub and soft rush within broadleaved semi-natural woodland	
2	Semi-mature silver birch plantation woodland to be removed	
3	Previous sand martin bank recorded in 2014. No evidence in 2019	No photo available

4	Bird box and moderate bat roosting potential tree.	 

		
5	Potential otter resting site	

6	Two roe deer	
7	Deer slots	
8	Toad	

Spillway with coniferous plantation woodland the left and broadleaved semi-natural woodland to the right	
River Hodder	

Ditch running into the Rive Hodder within broadleaved semi-natural woodland	
Area of hardstanding where the compound will be located to the north of the WTW	
Example of suitable hibernacula for reptiles in the form of rock piles	

Stocks reservoir embankment	
Ditch with Ponds 3a, 3b and 3c along it.	
Bird nests within the broadleaved plantation woodland to be removed.	

The River Hodder adjacent to the WTW	
Number of bird nests within the broadleaved semi-natural woodland to the east of the WTW	
Example of gaps in the soffit boards on Building 2	

Bat droppings in the corner of Building 2 and 3	
Pipistrelle bat recorded within Building 2	
Bat droppings within Building 2	

Bat droppings within Building 2	
The north of Stocks Reservoir	
Island on Stocks Reservoir	

Stocks Reservoir on the east side with the island	
Rocky edges to Stocks Reservoir	
Inundation vegetation	

Duck egg recorded to the NW of the reservoir.	
Hover 1 – active hover due to recent otter spraint recorded (in red) at the entrance to the west of the reservoir.	

Hover 2 – active hover to the west of the reservoir under a large rock fresh spraint was recorded (in red).

Hover 3 – active hover with spraint at the entrance (in red) location to the west of the reservoir

Hover 4 – active with spraint recorded at the entrance (in red) to the west of the reservoir.

Pied wagtail nest to the west of the reservoir with eggs.

Spraint 1 to the south east of the reservoir.

Spraint 2 to the south east of the reservoir.

Spraint 3 to the east of the reservoir.

Spraint 4 to the north east of the reservoir.	
Spraint 5 to the north of the reservoir.	
Spraint 6 to the north of the reservoir.	
PLEASE NOTE CONFIDENTIAL INFORMATION HAS BEEN REMOVED FROM THIS SECTION	

Source: Mott MacDonald, 2019

D. Habitat Suitability Index Results

Table 3: HSI Result for Pond 3b

Feature	Answer	Score
Location	A	1
Pond area	1.6m^2	0
Pond drying	Annually	0.1
Water quality	Moderate	0.67
Shade	50%	1
Fowl	Absent	1
Fish	Absent	1
Ponds	One	0.69
Terrestrial habitat	Good	1
Macrophytes	25%	0.56
	Total	0.38

Source: Mott MacDonald, 2019

E. Proposed Works

F. Non-statutory Designated Sites

G. Otter and Breeding Bird Signs

H. CONFIDENTIAL Badger Signs Map

PLEASE NOTE CONFIDENTIAL INFORMATION HAS BEEN REMOVED FROM THIS SECTION

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