

Alston / Spade Mill Pipeline, Longridge: Ecological Constraints Table

Constraints are detailed within the below table which includes an assessment of potential impacts to ecological features together with recommendations for mitigation measures and timescales. The constraints are based upon surveys carried out including great crested newt eDNA surveys (May-June 2020) and extended Phase 1 Habitat surveys (October-November 2020). The Constraints Table should be referred to by the client and contractor at all stages of the proposed works.

Constraint	Description and map reference	Photographs	Potential Impact	Measures required	
				Action	Timescale
Priority Habitat: Hedgerows	Numerous hedgerows are located throughout the survey area, most of which are located along boundaries diving fields and along roadsides. Some were species-rich, whilst others were dominated by one species and scattered mature trees were located in many of the field boundary hedgerows. The majority of hedgerows were dominated by hawthorn (<i>Crataegus monogyna</i>), typically with a mixture of blackthorn (<i>Prunus spinosa</i>), holly (<i>Ilex aquifolium</i>), hazel (<i>Corylus avellana</i>), elder (<i>Sambucus nigra</i>), bramble (<i>Rubus fruticosus</i>), hornbeam (<i>Carpinus betulus</i>), dog rose (<i>Rosa canina</i>), willow (<i>Salix sp.</i>) and sycamore (<i>Acer pseudoplatanus</i>). Hedgerows were predominantly native, intact and most fall within criteria to be Habitats of Principal Importance (HPI). Many had dry ditches or shallow field drains at their base.		Habitat loss - Numerous hedgerows intersect the route and are likely to be directly impacted by the works. Direct impacts from branch damage and root compaction	Pre-construction surveys of affected hedgerows to inform replanting proposals and identify 'Important Hedgerows' that may require removal notices. Minimise length of hedgerow to be directly impacted, where possible. Mitigation for the loss of hedgerows should comprise the replacement planting of native species of at least the same length that is to be removed. Adopt tree protection measures. Measures to safeguard the canopy and Root Protection Area (RPA) of hedgerows to be retained should be in line with BS 5837:2012 (British Standard: BS5837).	Hedgerow surveys to be undertaken ideally between May-July. See also timescales relating to nesting birds.
Priority Habitat: Semi-natural woodland	Narrow strips of semi-natural broadleaf woodland are present surrounding some of the main watercourses within the survey area. These areas are dominated by semi-mature to mature trees with saplings and young trees also present. Typical species include sycamore, ash (<i>Fraxinus excelsior</i>), oak (<i>Quercus robur</i>), alder (<i>Alnus glutinosa</i>) and beech (<i>Fagus sylvatica</i>), with occasional silver birch (<i>Betula pendula</i>), wych elm (<i>Ulmus glabra</i>), Norway maple (<i>Acer platanoides</i>), rowan (<i>Sorbus aucuparia</i>) and horse chestnut (<i>Aesculus hippocastanum</i>). These woodlands have a fairly open understorey, with scattered hawthorn, hazel, elder and holly present, and a varied ground flora. Other smaller wooded stands are present, including a small stand of woodland to the south of Whittingham Lane (Target Note 17) and a wooded marshy depression dominated by willow in Section 9 (Target Note 5).		Habitat loss - The majority of woodland areas are not located in proximity to the route. However, minor pruning / felling works may be required, such as in the west of Section 10. Direct impacts from branch damage and root compaction	Pre-construction surveys to advise on impact reduction, mitigation and reinstatement. Avoid loss / direct impact of this priority habitat where possible. If this is not possible, mitigation for the loss should comprise the replacement planting of native species on a 2:1 basis. Adopt tree protection measures. Measures to safeguard the canopy and Root Protection Area (RPA) of trees in woodland to be retained should be in line with BS 5837:2012 (British Standard: BS5837).	Woodland surveys ideally between May-June to allow an assessment of spring ground flora. See also timing relating to nesting birds.

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Priority Habitat: Watercourses	Several watercourses are present throughout the survey area. These comprise a few main brooks and several smaller streams and drains along field boundaries. The brooks are likely HPI, however the smaller watercourses hold less intrinsic ecological value and likely do not meet the HPI criteria as most are not near-natural. The first brook is an extension of Dean Brook, running parallel to the pipeline route in Sections 4 & 5 and situated within in a wooded clough (Target Note 1). The second is Blundel Brook which runs through Sections 6, 7 & 8. In Section 6 it is situated between improved fields with only some scattered trees and scrub along its banks, which are dominated by grasses and tall ruderal vegetation (Target Note 2). In Sections 7 and 8, trees are continuously present along the brook but the understorey is very open, dominated by improved grassland or tall ruderal vegetation, and overall forms a narrow vegetated corridor (Target Note 19). Savick Brook is situated in Section 10 of the route, within a narrow wooded clough (Target Note 3) and the pipeline appears to intersect it. A tributary of Savick Brook also extends into Section 11 (Target Note 4), where the pipeline route intersects the watercourse again. This section is located in a deep ditch running along hedgerows and passes adjacent to an access road and improved fields. The brooks are all approximately 1 – 2.5 m wide and up to 60 cm deep, with a slow to moderate flow. They have a muddy, sandy and slightly rocky substrate and the water appeared turbid at the time of survey, with lots of litter noted within them. Mature and semi-mature trees are located along their length and some sections are located within wooded cloughs, so are heavily shaded, whilst other sections pass through open areas between fields. Banks range from near vertical to near horizontal, from approximately 10 cm high to 2 m high, and are predominantly muddy with adjacent tall ruderal vegetation. The remainder of the watercourses are smaller streams and field drains. Most of which are located below or adjacent to hedgerows, from 20 cm - 1 m wide and approximately 2 cm - 20 cm deep. Most of these channels are similar in nature, featuring a very shallow, narrow and slow flow with a muddy substrate. Sloping banks are typically dominated by a hedgerow on one side with tall ruderal and grasses on the other. Occasional aquatic plants present include brooklime (<i>Veronica beccabunga</i>) and soft rush (<i>Juncus effusus</i>). Most drains were very shallow at the time of survey and are considered likely to become completely dry during the summer months. Some sections of watercourses were culverted over a short distance, such as beneath roads or access tracks between fields (Target Note 16).	   	Habitat loss / direct damage - The pipeline route will pass through a few brooks and several smaller streams / field drains. Pollution of watercourses – Works in proximity to watercourses may result in pollution, such as from silt and/ or fuel.	Pre-construction surveys to advise on impact reduction, mitigation and reinstatement. Minimise direct impacts to any watercourse, particularly the brooks. Where this is not possible, habitat enhancement measures should be incorporated following completion of works. Pollution control measures should be adopted	None.

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Semi-mature to mature trees	Semi-mature and mature trees are located along field boundaries throughout the survey area, many within hedgerows, and some individuals are located around ponds and watercourses, with a few also situated centrally within improved fields. Species present included; oak, sycamore, alder, ash, rowan and willow.		Habitat loss – Felling of several trees is likely, whilst pruning may also be required Damage to branches and roots of trees – where works are to be located in proximity to trees to be retained.	Avoid tree felling where possible. Where this is not possible, mitigation for the loss of semi-mature to mature trees should comprise the replacement planting of native species on a 2:1 basis once works are complete, or in a suitable alternative area in the locality. Adopt tree protection measures. Measures to safeguard the canopy and Root Protection Area (RPA) of trees to be retained should be in line with BS 5837:2012 (British Standard: BS5837).	None, but see timescales relating to nesting birds.
Bats	Semi-mature to mature trees throughout the survey area provide potential roosting habitat for bats. These trees are predominantly located within hedgerows, along field boundaries or within areas of woodland*. Potential roosting features include knot holes, hazard beams, cavities within the main stem, broken limbs and woodpecker holes. Additionally, a few trees along the route have bat boxes attached to them. Trees that were assessed to hold moderate or high potential for roosting bats (in line with Collins, 2016) are labelled on the Ecological Constraints Plan. None of the buildings were assessed for their potential to support roosting bats as it is understood that none are to be directly impacted by the works. The woodland edges, hedgerows, watercourses and bodies of water provide good foraging and commuting habitat for bats. However, it is understood that works will be temporary in nature and only very small sections of suitable foraging / commuting habitat for bats will be directly impacted. Therefore, it is unlikely that foraging and commuting bats will be significantly impacted by the works in the long term. *: Trees within woodlands were not individually assessed for their potential to support roosting bats so further survey of these trees will be required if any direct impacts are anticipated	  	Disturbance/harm of roosting bats during tree felling / pruning Loss of suitable roosting habitat	Ground level assessment of bat roost potential for any of the bat roost potential trees affected by the proposals. If tree or tree limb removal is required of a tree with moderate / high potential for roosting bats, it is advised that an aerial inspection is undertaken by a suitably qualified ecologist, using a torch and an endoscope to thoroughly search any features prior to commencement of works. This will assess the likely presence of bats and determine the best course of action considering any licensing requirements. If closer inspection of the PRFs verifies they are of moderate or high suitability, or evidence of bats is confirmed, further presence/absence and roost characterisation surveys may be required, involving dusk or dawn re-entry surveys. Compensation for the loss of suitable bat roosting habitat should be provided in the form of bat boxes where trees are to be felled.	None, unless dusk or dawn re-entry surveys are required which can only be completed between May and September (weather dependant).

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Badgers	Two badger setts were identified within Sections 7 and 9 of the route and evidence of badger including latrines, hairs and old, inactive setts were also recorded elsewhere within the survey area. The sett in Section 7 was likely an outlier sett and comprised one hole, located to the north of Blundel Brook within an improved field, on a south-facing bank close to the watercourse. Old claw marks were observed around the entrance of the sett and leaf litter was present inside, indicating no recent usage. The sett in Section 9 was located within a marshy depression along the route of the disused railway, surrounded by willow woodland (Target Note 5). This comprised two holes, one of which was potentially inactive as old bedding was found in the entrance and was generally untidy, indicating no recent usage. Claw marks and badger hair was found in the entrance of the second hole, which was tidier and also appeared to have fresher spoil outside. The ground outside both holes was heavily poached by cattle at the time of survey, indicating heavy disturbance directly outside the sett. This is likely an outlier sett, but potentially inactive. The wooded cloughs around the brooks and the wooded motorway verge provide good badger habitat, including sett building opportunities. A badger print was recorded along the banks of the brook in Section 10 and an old, disused badger sett was observed along the banks of the brook in Section 4 (Target Note 8). A badger latrine was also recorded within the woodland in Section 5, with both fresh and old badger faeces recorded, and a second fresh badger latrine was observed within the woodland in Section 4. Finally, badger hairs and a push-through were recorded beneath the scrub / hedge in Section 7 (Target Note 31).	  	Disturbance of a sett – if construction works are required within 30 m of an active sett Direct harm / injury from open excavations badgers could fall into.	A pre-commencement walkover survey will be conducted of suitable sett-building habitat for badger which is to be directly impacted. This can be conducted during the watercourse, woodland and hedgerow surveys detailed above. If any works are required within 30 m of a badger hole, a sett monitoring survey may be required. Camera traps will be placed and sticks will be placed in the entrance to monitor use of the sett. Any excavations should be covered / fitted with mammal ramps if left overnight to ensure that any animals that enter can safely escape. Excavations will be backfilled as soon as possible to minimise the potential for animals to become trapped.	None. If required, sett monitoring surveys should be conducted over a minimum period of 28 days
Otter and water vole	All watercourses within the survey area were fully inspected for signs of otter and water vole, where accessible, and were assessed for their suitability for each species. Camera traps were also installed along suitable watercourses. <i>Otter</i> In general, the brooks (see descriptions above) provide suitable habitat for otter, particularly the watercourses within wooded cloughs at Target Notes 1 and 3. Although a little shallow, they are mostly well sheltered with vegetated muddy banks and surrounded by woodland vegetation, with many overhanging roots / root buttresses noted. This habitat provides holt opportunities as well as commuting and foraging opportunities for otter, however no evidence of holts were observed during the survey. The smaller streams and field drains located between grazed and arable fields were considered sub-optimal for otter as they are too narrow, shallow and they are more exposed, with only hedgerows and	 	Disturbance and direct impact to otter resting and feeding habitat- The pipeline route intersects a watercourse that otters are known to pass through. Depending on construction methodology, direct impacts are possible. Destruction or disturbance of water vole burrows – The pipeline route intersects a few brooks and several smaller streams / field drains. Depending on construction methodology, direct impacts are possible.	Further surveys to confirm the presence of water vole and otter. Pre-construction surveys to advise on impact reduction, mitigation including licensing if required and reinstatement. Avoid direct impacts to suitable otter habitat (the brooks) and water vole habitat (brooks and smaller streams / field drains). Avoid works within a 10 m buffer of these watercourses. Where this is not possible, further otter and water vole surveys may be required. Pollution control measures should be adopted	Further otter and water vole surveys should be conducted between April and June.

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	tall ruderal vegetation for shelter. Most are located adjacent to grazed or arable fields which are subject to disturbances. These smaller watercourses provide sub-optimal habitat for otter, but they could occasionally commute through some. Otter footprints were identified on a shallow sandy bank of the brook passing through Section 10 and camera traps confirmed presence of otter in this location. Prints likely associated with otter were also observed on the banks of the brook in Section 7 / 8. However these prints were indistinct so could not be confirmed. Additional small mammal prints have also been recorded along other watercourses (Target Note 15), but these were very unclear so could not be identified. <i>Water vole</i> The brooks and many of the smaller streams and field drains provide suitable habitat for water vole. The brooks have steep muddy banks which are well vegetated and provided many burrowing, shelter and foraging opportunities. Additionally, many of the smaller streams are located within ditches adjacent to hedgerows and have banks dominated by tall ruderal vegetation which provide sufficient shelter and burrowing opportunities in muddy banks. Although sections of some of the streams are exposed, with grassy banks located between improved / grazed fields, water vole could still commute through. Burrows were observed within the banks of watercourses in a few locations that had a size and shape consistent with water vole. Additionally, small mammal prints were recorded in a few locations which are potentially associated with water vole (Target Note 10). However, rats have very similar burrows and footprints to water vole so these field signs are not conclusive of water vole. Even so, droppings consistent with water vole were also found in two locations adjacent to watercourses (Target Note 9). The camera traps did not identify any water vole throughout the surveys, but other small mammal species recorded include rat, mouse and stoat. Given the evidence found during the field surveys and the abundance of suitable habitat within the surrounding area, water vole could potentially utilise the brooks and smaller streams within the survey area and so it should be assumed that the burrows observed are associated with water vole.	  	Works in proximity to the watercourses (within 10 m) have the potential to cause indirect disturbance of otter and water vole, for example through vibration or pollution		

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Amphibians including great crested newts	Several ponds are located within the survey area, all with different characteristics such as size, water quality and surrounding habitat. Some were assessed to provide good habitat suitability for GCN, whilst others provide limited breeding opportunities for this species. Previous great crested newt (GCN) eDNA surveys have been completed of these ponds to determine presence / absence of GCN. Results are detailed within Bowland Ecology Ltd report BOW20_345: Great Crested Newt eDNA Results. For any pond not previously surveyed for GCN (due to access constraints etc.), it should be assumed that it supports GCN. Three previously unmapped ponds were discovered during the field survey (Target Notes 24, 25 and 33) which have not been previously assessed for their potential to support GCN. It should be assumed that both ponds do support GCN populations. Suitable terrestrial habitat for amphibians includes woodlands (particularly those surrounding watercourses / waterbodies), hedgerows and scattered scrub. Additionally, a few small areas of tall ruderal vegetation (Target Note 11), marshy grassland (Target Note 13) and piles of hibernacula (Target Note 12) are present throughout the survey area, such as in the corner of improved fields.	 	Direct harm / injury if any works directly impact suitable ponds and during clearance of suitable terrestrial habitat Loss of suitable breeding and terrestrial habitat	Ponds with confirmed GCN presence will not be directly impacted by the works. Ponds which were previously unsurveyed for GCN should be subject to an eDNA survey where possible. Clearance of suitable terrestrial habitat and excavations within 50 m of breeding GCN ponds should be minimised. Where this is not possible, a licence from Natural England and population assessment surveys may be required. Avoid loss and direct impact of all other ponds where possible. If this is not possible, compensatory habitat should be provided. Reasonable avoidance measures will be adopted during clearance of suitable amphibian habitat.	eDNA surveys can be undertaken between 15th April and 30th June Clearance of suitable terrestrial amphibian habitat within GCN active season (April to October). If required, a suite of GCN population assessment surveys should be undertaken between March and June.
Nesting birds	Hedgerows, woodland, scattered trees, scrub and open grassland are present throughout the survey area which all provide suitable nesting habitat for a range of bird species, including ground nesting birds. Additionally, sand martin burrows were noted in the banks of one of the brooks in Section 6 (Target Note 14). Additionally, a kingfisher (<i>Alcedo atthis</i>) was observed during the field survey, flying along the brook in Section 7 (Target Note 18). This species is listed on the Wildlife and Countryside Act 1981 (as amended). Given the temporary nature of the works and as only a small section of watercourse will be impacted by the pipeline route, it is unlikely that the works will impact kingfisher.	  	Direct harm / injury and disturbance of nesting birds during vegetation clearance Destruction of sand martin burrows during direct works to watercourse	Breeding bird surveys to identify possible presence of notable bird territories and ground nesting bird habitat. Where vegetation clearance is required, this is to be carried out between September and February to avoid harm to any breeding birds or nests present. If nesting season (March - August inclusive) cannot be avoided a pre-works check undertaken by a suitability experienced ecologist will be required. If a nesting bird is identified, this nest will be left <i>in situ</i> until dependent young have fledged. No works will be permitted within 10 m of sand martin burrows. If this is not possible, a nesting bird survey should be undertaken to confirm presence of sand martins and inform the best course of action.	Breeding bird survey 2-3 visits. March to June. Vegetation clearance: September – February.

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Small mammals including hedgehog	A hedgehog (<i>Erinaceus europaeus</i>) was recorded during the trail camera surveys along the banks of the brook in Section 4. This is a Species of Principal importance (SPI). Additionally, a brown hare (<i>Lepus europaeus</i>) was observed during the field survey in Section 7 which is also a SPI (Target Note 32). Other small mammal species recorded during the trail camera surveys include mouse (likely <i>Apodemus sylvaticus</i>) and stoat (<i>Mustela erminea</i>). Suitable habitat for small mammals including hedgehogs comprise woodlands, wood / brash piles, hedgerows and scrub. Additionally, the improved grassland fields and hedgerow network in the agricultural landscape provide suitable habitat for brown hare.		Direct harm / injury from open excavations small mammals could fall into. Direct harm / injury to hedgehogs during clearance of potential refugia	Any excavations should be covered / fitted with mammal ramps if left overnight to ensure that any animals that enter can safely escape. Excavations will be backfilled as soon as possible to minimise the potential for animals to become trapped. Clearance of suitable hedgehog refugia to be undertaken using hand-held machinery. Small mammals encountered at any time during works should be moved to a safe location away from the works and placed within a similar habitat to which they were found. Additionally, storage of materials must be contained within sub-optimal habitat (bare ground or hard standing, or raised off the ground) and any soil/spoil stored on the site must be compacted so no voids are present.	None.
Invasive plant species	Himalayan balsam (<i>Impatiens glandulifera</i>) is widespread across the survey area, predominantly located around watercourses and field boundaries. This is a non-native invasive plant species, listed in Section 9 of the Wildlife and Countryside Act 1981 (as amended), for which it is illegal to cause the spread of in the wild. Montbretia was identified within Section 8 within an arable field. This species is also listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). Cotoneaster is also present within some residential gardens and adjacent to an access track. Certain species of Cotoneaster are also listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended); the specimens present within the site could not be identified to a species level at the time of survey and so, as a precaution, should be treated as being listed on Schedule 9. It is unlikely that any ground disturbance will be required within proximity to this species given its location.		Spread of invasive species in wild - Excavation and vegetation clearance in proximity to areas colonised by Himalayan balsam or the stand of Montbretia have potential to spread this species in the absence of mitigation.	Pre-works surveys and monitoring during construction. If vegetation clearance or excavation is required within proximity of Himalayan balsam, care should be taken not to cause the spread of this species. Reasonable avoidance measures should be implemented. If works directly affect areas of Cotoneaster or Montbretia, no excavated material is to be taken off site. This should be disposed of responsibly.	Pre-works surveys and monitoring during the growing season March-October. Control measures can be seasonally dependent for different species.

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