

**HyNet North West
Hydrogen Pipeline**

Delivering clean growth

Cadent
Your Gas Network

HyNet North West Hydrogen Pipeline Project

Cadent Ltd

Outline Landscape and Ecological Management Plan

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Volume

0001

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Glossary

Term	Description
Block Valve Installations (BVI)	These sites are separate facilities to the HAGIs and are also required to control the flow and pressure of hydrogen at key points along the proposed pipeline.
Construction Environmental Management Plan (CEMP)	Sets out how the construction process will avoid, minimise or mitigate effects on the environment and surrounding area.
Development Consent Order (DCO)	A Development Consent Order (DCO) is required for developments which are of national significance, under the Planning Act 2008.
Development Consent Order (DCO) Application	An application for development consent to undertake a Nationally Significant Infrastructure Project, under the Planning Act 2008, made to the Planning Inspectorate. The Planning Inspectorate will consider the application and make a recommendation to the Secretary of State for Energy Security and Net Zero, who will decide on whether development consent should be granted for the Project.
Draft Order Limits	The area within which the Project and associated infrastructure will be located, including the temporary and permanent construction and operational work areas.
Enhancement	Proposals that seek to improve the landscape resource of the site and its wider setting beyond its baseline condition.
Environmental measures	Measures which are proposed to prevent, reduce and where possible offset any significant adverse effects (or to avoid, reduce and if possible, remedy identified effects).
Environmental Statement (ES)	An Environmental Statement accompanies the application for a Development Consent Order (DCO). The ES provides a full assessment of the likely significant effects associated with the construction, operation and decommissioning phases of the development. It is the written output presenting the full findings of the Environmental Impact Assessment.
Hydrogen Above Ground Installation (HAGI)	HAGIs are required to facilitate connections to the network producers, customers and storage and to be able to monitor, operate, maintain and inspect the network during operation. The HAGI sites include a range of permanent above ground components.

Term	Description
Key characteristics	Those combinations of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.
Land cover	The surface cover of the land, usually expressed in terms of vegetation cover or lack of it. Related to but not the same as land use.
Landscape character	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape elements	Individual parts which make up the landscape, such as, for example, trees, hedges and buildings.
Local Wildlife Site (LWS)	A non-statutory site designated for nature conservation. Usually designated by a local authority or nature conservation partnership using criteria aligned with local or regional nature conservation priorities.
National Policy Statement (NPS)	Sets out the government's policy on national significant infrastructure development, and are the primary policy used by the Secretary of State in examining and determining applications for Nationally Significant Infrastructure Projects (NSIPs).
Photomontage	A visualisation which superimposes an image of the proposed development upon a photograph or series of photographs.
The Project	Cadent Ltd is developing the HyNet North West Hydrogen Pipeline Project ('the Project') to construct and operate the UK's first 100 percent hydrogen pipeline network at scale.

Executive Summary

This Outline Landscape and Ecology Management Plan (LEMP) has been prepared to provide details of the measures proposed with regards to landscaping, habitat creation and reinstatement works, together with the monitoring and management of these measures. The Outline LEMP is part of a set of management plans that will secure the delivery of measures committed to in the Development Consent Order (DCO) Application to manage the impacts arising during the construction and operation of the Project.

The Outline LEMP has been produced following the targeted surveys and assessment reported in **Chapter 5: Biodiversity** of the Draft ES and **Chapter 8: Landscape and visual**, along with the accompanying Arboricultural Impact Assessment (AIA) in **Appendix 8C**. This survey and assessment process has identified the embedded environmental measures reported within **Chapters 5 and 8** and **Appendix 8C** of the Draft ES.

This Outline LEMP includes the landscaping and habitat creation at the Hydrogen Above Ground Installations (HAGIs) and Block Valve Installations (BVIs) as well as the reinstatement for the works associated with the pipeline corridor. It also includes the monitoring and management requirements to ensure success of the embedded environmental measures designed to minimise impacts resulting from the Project.

Stage specific LEMPs would be produced by the appointed Contractor(s) following the grant of the Development Consent Order (DCO) and prior to the relevant stage of construction. These will be produced in accordance with this Outline LEMP for approval with the relevant planning authority, prior to the commencement of that stage of works. The stage specific LEMPs for the HAGIs and BVIs shall be developed and submitted for approval alongside the detailed design of this infrastructure.

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1. Introduction

1.1 Overview of the Project

- 1.1.1 The Project includes the construction, operation and maintenance approximately 100km of new pipeline to distribute hydrogen to industry and for blending with the gas network in the North West. This also includes a number of Hydrogen Above Ground Installations (HAGIs) (including Block Valve Installations (BVIs) as described in **Chapter 2: The Project**), which are required to control the flow and pressure of hydrogen at key points along the proposed pipeline.
- 1.1.2 The Project would connect to the Hydrogen Production Plant at the Stanlow site as the source of hydrogen for onward distribution to the Network. The pipeline would continue to the Central Hub at the centre of the Network, which serves as the connection and onward distribution point to the North, East and South corridors, which would extend to locations near St. Helens, Partington and southeast of Northwich respectively. The Project would also link to underground hydrogen storage facilities in Cheshire used to balance supply and demand through the network. The location of the Project is illustrated by the Draft Order Limits in **Figure 1.1** of the Draft ES.
- 1.1.3 The proposed key components of the Project are shown in **Figure 1.2** of the Draft ES and can be summarised as follows::
- West Corridor: Stanlow Hydrogen Production Plant (HPP) to Central Hub HAGI, incorporating Rocksavage HAGI; spurs to customers at Intergen, Rocksavage.
 - North Corridor: Central Hub HAGI to St Helens, incorporating HAGIs at Higher Walton and Clock Face; spurs to customers at Ingevity, Warrington; Novelis, Warrington; NGF Europe Ltd., Clock Face; NSG Pilkington Greengate Works, St Helens; and Glass Futures, St Helens.
 - East Corridor: Central Hub HAGI to Partington HAGI, incorporating a HAGI at Warburton and BVI near Sworton Heath; spurs to Cadent AGI, Warburton; and customers at Partington Cadent AGI; and Basell Polyolefins, Partington. Work is ongoing with other potential customers in Partington who would construct their own pipelines to the HAGI.
 - South Corridor: Central Hub HAGI to Hydrogen Storage Facility (HSF) at salt caverns located north of Middlewich, incorporating a HAGI at the HSF and a BVI near the A556 (Chester Road). Further detail about the Project is provided in Chapter 2: The Project.
- 1.1.4 The presently anticipated maximum extent of land in which the Project may take place, which is assessed in this Draft ES, is defined by the 'Draft Order Limits', land within which is hereafter referred to as 'land within the Draft Order Limits'.
- 1.1.5 A proportionate degree of flexibility has been incorporated into the Project design so that unforeseen issues that may be encountered following consent can be sufficiently mitigated. For example, previously unidentified poor ground conditions

may require a pipeline section to be re-routed slightly for geotechnical reasons. Therefore, to allow for this, new infrastructure would be constructed within specified Limits of Deviation (LoD) which identify a maximum distance or measurement of variation within which the works must be constructed; further detail is provided on LoD in **Chapter 2: The Project** in the Draft ES.

1.2 Purpose

1.2.1 This Outline LEMP addresses the following elements of the Project:

- Landscaping and habitat creation at the HAGIs and BVIs (**Sections 2 and 3**);
- Reinstatement of habitat and landscape features along the pipeline corridor and within temporary construction compounds (**Section 4**); and
- Landscape and habitat monitoring and management (**Section 5**).

1.2.2 The Outline LEMP is part of a set of management plans that will secure the delivery of measures committed to in the Development Consent Order (DCO) application to manage the impacts arising during the construction and operation of the Project.

1.2.3 The Outline Construction Environmental Management Plan (CEMP) covers the landscape and ecology issues associated with construction works. This includes measures to ensure legal compliance with relevant wildlife legislation, pollution control and scheduling of construction works to minimise effects.

Stage Specific LEMPs

1.2.4 Paragraphs 5.10.29 and 5.10.30 of the Overarching National Policy Statement for Energy (EN-1)¹ states that the Secretary of State should take into consideration the level of detail in the design, which the applicant has provided and is secured in the Development Consent Order, and the extent to which design details are subject to future approvals. With regard to the latter, the Secretary of State “*should be satisfied that local authorities will have sufficient design content secured to ensure that future consenting will meet landscape, visual and good design objectives*”¹.

1.2.5 It is therefore anticipated that stage specific LEMPs will be prepared for areas of habitat creation and reinstatement along the pipeline corridor, including associated areas such as temporary compounds, prior to the relevant stage of construction. These will be produced in accordance with this Outline LEMP for approval with the relevant planning authority, prior to the commencement of that stage of works.

1.2.6 The stage specific LEMPs for the HAGIs and BVIs will include detailed landscape plans. These shall be designed in accordance with the design principles set out in **Figures 1 to 13** of this Outline LEMP and submitted alongside the detailed design for the HAGI and BVI sites for approval by the relevant planning authority.

¹ Department for Energy Security & Net Zero (2023). Overarching National Policy Statement for Energy (EN-1). (online) Available at: <https://assets.publishing.service.gov.uk/media/65bbfbd709fe1000f637052/overarching-nps-for-energy-en1.pdf>

- 1.2.7 The stage specific LEMPs shall also include planting specifications, plant schedules (detailing number of plants / density / size and species), soil preparation, landscape programme of works (including targeted planting seasons and advance planting opportunities) and a Landscape Management Plan (including maintenance and monitoring) to cover years one to ten to ensure the establishment of the landscape proposals.

2. Landscape design and mitigation

2.1 Overview

- 2.1.1 This section of the Outline LEMP sets out the Landscape Strategy or approach for the Project, covering the HAGIs and BVIs and associated areas of construction within or adjoining the above ground infrastructure sites.
- 2.1.2 The Landscape Strategy for the reinstatement of landscape elements (vegetation and ‘hard works’ such as footpath surfacing and the provision of gates / stiles and field boundaries along the pipeline corridor) is detailed in **Section 4: Landscape and habitat reinstatement**.
- 2.1.3 The landscape related design principles for each HAGI and BVI are also provided in the Indicative Landscape Plans for each site as follows:
- **Figure 1** HPP HAGI Landscape Planting Proposals;
 - **Figure 2** Rocksavage HAGI Landscape Planting Proposals;
 - **Figure 3** Runcorn HAGI Landscape Planting Proposals;
 - **Figure 4** Central Hub HAGI Landscape Planting Proposals;
 - **Figure 5** Higher Walton (HWH2) HAGI Landscape Planting Proposals;
 - **Figure 6** Higher Walton (HWH8) HAGI Landscape Planting Proposals;
 - **Figure 7** Clock Face HAGI Landscape Planting Proposals;
 - **Figure 8** Warburton HAGI Landscape Planting Proposals;
 - **Figure 9** Partington (P1) HAGI Landscape Planting Proposals;
 - **Figure 10** Partington (P2) HAGI Landscape Planting Proposals;
 - **Figure 11** Hydrogen Storage Facility HAGI Landscape Planting Proposals;
 - **Figure 12** Hartford BVI Landscape Planting Proposals; and
 - **Figure 13** Sworton Heath BVI Landscape Planting Proposals.
- 2.1.4 These figures outline the broad principles of the HAGI and BVI planting proposals but may be subject to minor changes as part of the stage specific LEMPs, depending on the final footprint of the above ground infrastructure and pipeline alignment within the LoD.

2.2 Landscape Design: All Sites

- 2.2.1 The following design principles are applicable to all HAGI and BVI sites:

Continued Detailed Design Evolution

- 2.2.2 The detailed landscape design will continue to work with other technical and environmental disciplines to advance the landscape design for each HAGI and BVI site and embedded environmental measures, maintaining or advancing the current standard of design and reviewing the maximum design parameters, where possible.

Retention and Protection of Landscape Elements

- 2.2.3 Existing vegetation, which is outside of the footprint of the HAGIs, BVIs and associated construction compounds, pipeline corridors, temporary crossing compounds, materials storages areas and temporary/permanent access tracks would be retained and protected.
- 2.2.4 With regard to tree protection, specifications for tree protection fencing will be produced with a range of fencing types described for use in different situations (e.g. steep terrain or wet ground) to provide an appropriate level of protection in accordance with BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations².
- 2.2.5 The combined protected areas around all trees would constitute a Construction Exclusion Zone within which no unplanned access or operations would be permitted. The alignment of Construction Exclusion Zones will be detailed on a series of Tree Protection Plans, which would be produced for all sites with trees as part of a Tree and Hedgerow Protection Strategy (THPS).
- 2.2.6 The extent of tree removal currently anticipated is shown in **Appendix 8C: Arboricultural Impact Assessment** of the **Draft ES**.

Lighting

- 2.2.7 Lighting requirements (for scheduled maintenance outages or emergencies) within the HAGIs would be directed downward and shielded to reduce glare outside the facility. Lighting columns within the HAGIs are expected to be:
- 3m in height at the Warburton, Rocksavage and Central Hub HAGIs (this is dependent on being able to justify a deviation from recognised engineering standards and is currently under review. Confirmation will be provided in the Final ES); and
 - 5m in height at the HPP, Partington, Runcorn, Inovyn HSF, Clock Face and Higher Walton HAGIs.
- 2.2.8 The principles of lighting design will be informed by the joint guidance provided by the Institution of Lighting Professionals and Bat Conservation Trust in *Guidance*

² BSI Standards Publication (2012). BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations.

Note GN08/23 Bats and artificial lighting at night³ as well as Guidance Note 01/21 for the Reduction of Obtrusive Light⁴, as required.

- 2.2.9 The lighting design will account for the potential effects on both people (residents, road users, walkers) and biodiversity by taking measures to minimise lighting use, minimise light spill, use most appropriate wave lengths of light and locate lighting in the most appropriate locations.

2.3 Landscape design: Hydrogen Production Plant (HPP) HAGI

LPA: Cheshire West and Chester Council

Landscape Design: Indicative Landscape Plan

- 2.3.1 The outline landscape planting proposals for the Hydrogen Production Plant HAGI are illustrated in **Figure 1**.
- 2.3.2 No planting is proposed at the HPP HAGI site within the Stanlow site due to its location within an already heavily industrialised location and the high levels of vegetative screening already provided between the HPP HAGI site and landscape and visual receptors in the wider environment.

Site access

- 2.3.3 The permanent access to the HAGI would be via the existing access to the Essar Stanlow complex from Pool Road.

Architectural Strategy

- 2.3.4 The colour of the kiosk and other infrastructure within the HAGI will be considered in order to reduce its visibility from the wider landscape and to 'break up' and soften the appearance of the HAGI. The HPP HAGI kiosk would be constructed from brick.

2.4 Rocksavage HAGI Landscape Design Principles

LPA: Cheshire West and Chester Council

- 2.4.1 Landscape design principles for the Rocksavage HAGI are as follows:

Landscape Design: Indicative Landscape Plan

- 2.4.2 The outline landscape planting proposals for the Rocksavage HAGI are illustrated in **Figure 2** and described as follows:

³ Institution of Lighting Professionals and Bat Conservation Trust (2023). Guidance Note GN08/23. Bats and artificial lighting at night. (online) Available at: <https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/>

⁴ Institution of Lighting Professionals (2021). Guidance Note 01/21 Reduction of Obtrusive Light. (online) Available at: <https://theilp.org.uk/publication/guidance-note-1-for-the-reduction-of-obtrusive-light-2021/>

- Wildflower grassland is proposed within a restricted planting zone which is expected to be 50m from the above ground equipment of the HAGI to provide a zone which contains no tree or shrub planting. It should be noted that many existing Natural Gas Above Ground Installations (AGIs) also have such restricted planting zones.
- Outside of this zone, habitat mitigation within the East Clifton Tip Local Wildlife Site will be subject to further consultation with the relevant stakeholders and land owner and will be updated in the Final ES. A restricted planting zone above each of the pipelines is indicated on **Figure 2** and planting will need to adhere to the species restrictions set out in **Appendix A: Planting and Management Guidance for underground pipelines**.

Site access

- 2.4.3 The permanent access to the HAGI would be taken from the Frodsham Substation access road, which joins the A56 Niddries Lane close to the Sutton Weaver Swing Bridge. A private access road branches off the Frodsham Substation access road continuing to the Weaver Sailing and Ski Club, and the HAGI access would be formed off this private access road.

Architectural Strategy

- 2.4.4 The colour of the kiosk and other infrastructure within the HAGI will be considered to reduce its visibility from the wider landscape and to 'break up' and soften the appearance of the HAGI. The kiosks are typically prefabricated Glass Reinforced Plastic (GRP) units of approximately 2.4m height and the colour for the Rocksavage HAGI kiosk would be BS4800 14C39 Holly Green.

2.5 Runcorn HAGI Landscape Design Principles

LPA: Halton Borough Council

- 2.5.1 Landscape design principles for the Runcorn HAGI are as follows:

Landscape Design: Indicative Landscape Plan

- 2.5.2 The outline landscape planting proposals for the Runcorn HAGI are illustrated in **Figure 3** and described as follows:
- Wildflower grassland is proposed within a restricted planting zone which is expected to be 50m from the above ground equipment of the HAGI to provide a clear zone which contains no tree or shrub planting. This wildflower grassland extends beyond 50m to meet retained landscape features.
 - A hedgerow is proposed to the north of the HAGI to create a new field boundary for the agricultural land to the north, provide visual screening and create a wildlife corridor between existing areas of woodland in the east (Clifton Cloughs_B Local Wildlife Site) and a linear group of trees to the west.

Site access

- 2.5.3 The permanent access to the HAGI would be taken from the Rocksavage Power Station access road.

Architectural Strategy

- 2.5.4 The colour of the kiosk and other infrastructure within the HAGI will be considered to reduce its visibility from the wider landscape and to 'break up' and soften the appearance of the HAGI. The colour for the Runcorn HAGI kiosk (typically constructed from GRP) would be BS4800 14C39 Holly Green.

2.6 Central Hub HAGI Landscape Design Principles

LPA: Cheshire West and Chester Council

- 2.6.1 Landscape design principles for the Central Hub HAGI are as follows:

Landscape Design: Indicative Landscape Plan

- 2.6.2 The outline landscape planting proposals for the Central Hub HAGI are illustrated in **Figure 4** and described as follows:
- Wildflower grassland is proposed within a restricted planting zone which is expected to be 50m from the above ground equipment of the HAGI to provide a clear zone which contains no tree or shrub planting.
 - To the north and west of the HAGI and beyond the restricted planting zone, an area of woodland is proposed. This woodland would reinforce the key characteristic of the host Landscape Character Area (LCA) 5d Whitley and Comberbach relating to "*Small farm woodlands, coverts and designed copses/clumps in parkland are important features of a landscape with generally relatively low woodland cover*"⁵ and contribute to the Built Development Guideline to "*Soften built edges and views of infrastructure by introducing small scale planting schemes using native broadleaved species*"⁵.

Site access

- 2.6.3 The permanent access to the HAGI would be taken from the A533 Northwich Road.

Architectural Strategy

- 2.6.4 The colour of the kiosk and other infrastructure within the HAGI will be considered to reduce its visibility from the wider landscape and to 'break up' and soften the appearance of the HAGI. The Central Hub HAGI kiosk would be constructed from brick.

⁵ Cheshire West and Chester (2016). Cheshire West and Chester Landscape Strategy (Online). Available at: <https://www.cheshirewestandchester.gov.uk/residents/planning-and-building-control/total-environment/local-landscape-character-assessment-landscape-strategy-2016>.

2.7 Higher Walton (HWH2) HAGI Landscape Design Principles

LPA: Warrington Borough Council

Landscape Design: Indicative Landscape Plan

2.7.1 The outline landscape planting proposals for the Higher Walton (HWH2) HAGI are illustrated in **Figure 5** and described as follows:

- Wildflower grassland is proposed within a restricted planting zone which is expected to be 50m from the above ground equipment of the HAGI to provide a clear zone which contains no tree or shrub planting. This zone extends close to public footpath 00237/26/1, which limits the opportunities for screening vegetation to be implemented between the HAGI and the section of footpath due north of the HAGI.
- Outside of this restricted planting zone, scrub planting is proposed to the west of the HAGI and would provide screening for walkers using public footpath 00237/26/1 and users of the Manchester Ship Canal when approaching from the west. It would also extend habitats southwards from the Moore Nature Reserve to the north, towards the Manchester Ship Canal.
- Within the eastern part of the site and beyond the restricted planting zone, areas of woodland are proposed. These areas would again extend the habitats southwards from the Moore Nature Reserve to the north and provide screening of the HAGI in the views of walkers using public footpath 00237/26/1 and users of the Manchester Ship Canal when approaching from the east. A restricted planting zone above each of the pipelines is indicated on **Figure 5** and planting will need to adhere to the species restrictions set out in **Appendix A: Planting and Management Guidance for underground pipelines**.

Site access

2.7.2 The permanent access to the HAGI would be taken from Birchwood Lane to the north.

Architectural Strategy

2.7.3 The colour of the kiosk and other infrastructure within the HAGI will be considered to reduce its visibility from the wider landscape and to 'break up' and soften the appearance of the HAGI. The colour for the Higher Walton (HWH2) HAGI kiosk (typically constructed from GRP) would be BS4800 14C39 Holly Green.

2.8 Higher Walton (HWH8) HAGI Landscape Design Principles

LPA: Warrington Borough Council

Landscape Design: Indicative Landscape Plan

2.8.1 The outline landscape planting proposals for the Higher Walton (HWH8) HAGI are illustrated in **Figure 6** and described as follows:

- Wildflower grassland is proposed within a restricted planting zone which is expected to be 50m from the above ground equipment of the HAGI to provide a clear zone which contains no tree or shrub planting.
- Outside of this zone, the wildflower meadow extends to the existing field boundaries to the south and west of the HAGI.
- The eastern side of the Site, between the Draft Order Limits and the restricted planting zone, is proposed as woodland planting. This extends to the north along the Manchester Ship Canal, with the exception of the pipeline restricted planting zone which would be sown as wildflower meadow. This woodland would reflect the key characteristic of the host LCA 3a Appleton Park & Grappenhall relating to “*Linear woodlands, coverts and tree clumps*”⁶.

Site access

2.8.2 The design maturity for the Higher Walton (HWH8) HAGI is not yet at a level where the permanent access to the site is defined.

Architectural Strategy

2.8.3 The colour of the kiosk and other infrastructure within the HAGI will be considered to reduce its visibility from the wider landscape and to ‘break up’ and soften the appearance of the HAGI. The colour for the Higher Walton (HWH8) HAGI kiosk (typically constructed from GRP) would be BS4800 14C39 Holly Green.

2.9 Clock Face HAGI Landscape Design Principles

LPA: St Helens Borough Council

Landscape Design: Indicative Landscape Plan

2.9.1 The outline landscape planting proposals for the Clock Face HAGI are illustrated in **Figure 7** and described as follows:

- Wildflower grassland is proposed within a restricted planting zone which is expected to be 50m from the above ground equipment of the HAGI to provide a clear zone which contains no tree or shrub planting. To the south-east of the

⁶ Agathoclis Beckmann Landscape Architects (2007), Warrington: A Landscape Character Assessment (Online). Available at: https://www.warrington.gov.uk/sites/default/files/2019-08/landscape_character_assessment_2007.pdf

HAGI, the wildflower grassland would extend to meet the existing (retained) hedgerow along the western side of Jubits Lane.

- Outside of this restricted planting zone, woodland planting is proposed to the north-east, north-west and south-west of the HAGI. A restricted planting zone above each of the pipelines is indicated on **Figure 7** and planting will need to adhere to the species restrictions set out in **Appendix A: Planting and Management Guidance for underground pipelines**. An overhead line also passes to the north-west of the HAGI and a 6m width clear of tree planting is proposed below this line to reduce the risk of growth to a height which compromises statutory safety clearances.
- Along the western edge of the HAGI a strip of woodland edge planting is proposed, again with a 6m clear buffer proposed below the overhead line.

Site access

- 2.9.2 The permanent access to the HAGI would be taken from Jubits Lane to the east via an existing field gate.

Architectural Strategy

- 2.9.3 The colour of the kiosk and other infrastructure within the HAGI will be considered to reduce its visibility from the wider landscape and to 'break up' and soften the appearance of the HAGI. The colour for the Clock Face HAGI kiosk (typically constructed from GRP) would be BS4800 14C39 Holly Green.

2.10 Warburton HAGI Landscape Design Principles

LPA: Trafford Council

Landscape Design: Indicative Landscape Plan

- 2.10.1 The outline landscape planting proposals for the Warburton HAGI are illustrated in **Figure 8** and described as follows:
- Wildflower grassland is proposed within a restricted planting zone which is expected to be 50m from the above ground equipment of the HAGI to provide a clear zone which contains no tree or shrub planting.
 - Outside of this zone, roadside hedgerows are proposed along Carrgreen Lane to the north-west of the HAGI and along the B5160 Dunham Road to the north-east to provide screening for residents at properties along the B5160 Dunham Road.
 - To the east of the HAGI, woodland planting is proposed close to a group of mature trees (to be retained) with scrub planted close to an overhead line to reduce the risk of growth to a height which compromises statutory safety clearances.
 - To the south-west of the HAGI, a further area of woodland and woodland edge is proposed. This would reinforce the screening provided by the group of trees

along the southern edge of the site in views from the Trans Pennine Trail to the south.

- To the south of the HAGI, tree removal across the pipeline restricted planting zone would be replaced by a native hedge to maintain habitat connectivity along the Trans Pennine Trail.

Site access

2.10.2 The permanent access to the HAGI would be taken from Carrgreen Lane to the west of the HAGI.

Architectural Strategy

2.10.3 The colour of the kiosk and other infrastructure within the HAGI will be considered to reduce its visibility from the wider landscape and to 'break up' and soften the appearance of the HAGI. The colour for the Warburton HAGI kiosk (typically constructed from GRP) would be BS4800 14C39 Holly Green.

2.11 Partington (PH1) HAGI Landscape Design Principles

LPA: Trafford Council

Landscape Design: Indicative Landscape Plan

2.11.1 The outline landscape planting proposals for the Partington (PH1) HAGI are illustrated in **Figure 9**.

2.11.2 No planting is proposed at the Partington (PH1) HAGI site so as not to hinder any existing or future plans for the redevelopment of this brownfield area. High levels of vegetative screening are already provided between the Partington (PH1) HAGI and landscape/visual receptors to the south.

Site access

2.11.3 The permanent access to the HAGI would be taken from the existing network of roads which cross the brownfield land to the north of the HAGI.

Architectural Strategy

2.11.4 The colour of the kiosk and infrastructure within the HAGI will be considered to reduce its visibility from the wider landscape and to 'break up' and soften the appearance of the HAGI. The colour for the Partington (PH1) HAGI kiosk (typically constructed from GRP) would be BS4800 14C39 Holly Green.

2.12 Partington (PH2) HAGI Landscape Design Principles

LPA: Trafford Council

Landscape Design: Indicative Landscape Plan

2.12.1 The outline landscape planting proposals for the Partington (PH2) HAGI are illustrated in **Figure 10** and described as follows:

- Wildflower grassland is proposed within a restricted planting zone which is expected to be 50m from the above ground equipment of the HAGI to provide a clear zone which contains no tree or shrub planting.
- A belt of woodland is proposed along the southern edge of this zone to reinforce the existing line of trees along Ashton Road.
- Native hedgerows are proposed along the northern and eastern boundaries of the restricted planting zone to provide habitat connectivity between the existing tree belts and to separate the HAGI from the surrounding agricultural field.
- A native hedgerow is also proposed along the south-western corner, again to provide habitat connectivity between woodland belts and to provide screening from this section of Ashton Road, which forms a Transport for Manchester Cycle Route.

Site access

2.12.2 The design maturity for the Partington (PH2) HAGI is not yet at a level where the permanent access to the site is defined.

Architectural Strategy

2.12.3 The colour of the kiosk and other infrastructure within the HAGI will be considered to reduce its visibility from the wider landscape and to 'break up' and soften the appearance of the HAGI. The colour for the Partington (PH2) HAGI kiosk (typically constructed from GRP) would be BS4800 14C39 Holly Green.

2.13 Hydrogen Storage Facility (HSF) HAGI Landscape Design Principles

LPA: Cheshire West and Chester Council

Landscape Design: Indicative Landscape Plan

2.13.1 The outline landscape planting proposals for the HSF HAGI are illustrated in **Figure 11** and described as follows:

- Wildflower grassland is proposed within a restricted planting zone which is expected to be 50m from the above ground equipment of the HAGI to provide a clear zone, which contains no proposed tree or shrub planting.
- Outside of this zone, woodland is proposed to the south-west of the HAGI, which would reinforce the screening provided by retained trees to the north, east and south of the HAGI and screen views of the HAGI from nearby residential visual receptors. The woodland would also contribute to the key characteristic of the host LCA 10b Stublach Plain relating to "*the occasional covert or copse punctuates the landscape*"⁵ and would adhere to the Built

Development Guideline relating to “*Ensure any structures associated with the brine/salt extraction, gas storage and quarrying industries are well integrated into the landscape using native planting, and proposals are accompanied by enhancement of existing hedgerows and hedgerow trees in the vicinity of the site to ensure the landscape structure around any new facility is maintained/improved.*”⁵

- Further discussion is required with the owners of the site in relation to their own plans for gas storage and possible planting restrictions related to this operation.

Site access

- 2.13.2 The permanent access to the HAGI would be taken from the existing access within the Natural Gas Storage site.

Architectural Strategy

- 2.13.3 The colour of the kiosk and other infrastructure within the HAGI will be considered to reduce its visibility from the wider landscape and to ‘break up’ and soften the appearance of the HAGI. The colour for the HSF HAGI kiosk (typically constructed from GRP) would be BS4800 14C39 Holly Green.

2.14 Hartford BVI Landscape Design Principles

LPA: Cheshire West and Chester Council

Landscape Design: Indicative Landscape Plan

- 2.14.1 The outline landscape planting proposals for the Hartford BVI are illustrated in **Figure 12** and described as follows:
- Wildflower grassland is proposed within a restricted planting zone which is expected to be less than 50m from the above ground equipment of the BVI to provide a clear zone, which contains no proposed tree or shrub planting.
 - Outside of this zone, the planting would be implemented by Cemex in accordance with the approved restoration plan P5/1645/4 for the Forest Hill Quarry (Planning Permission 13/03715/MIN, as amended by Planning Permission 21/01861/S73). This is currently under discussion with Cemex.
 - Kiosks are not required at BVIs

Site access

- 2.14.2 The permanent access to the BVI would be taken from the existing access to the Forest Hill Quarry on the A556 Chester Road.

2.15 Sworton Heath BVI Landscape Design Principles

LPA: Cheshire East Council

Landscape Design: Indicative Landscape Plan

2.15.1 The outline landscape planting proposals for the Sworton Heath BVI are illustrated in **Figure 13** and described as follows:

- Wildflower grassland is proposed within a restricted planting zone which is expected to be less than 50m from the above ground equipment of the BVI to provide a clear zone which contains no proposed tree or shrub planting.
- Outside of this zone, woodland and woodland edge planting is proposed to the east and west of the BVI to reinforce the existing vegetative screening in the views of residents at properties to the east and west (at High Legh and along Crabtree Lane). The woodland would contribute to the key characteristic of the host LCA7a Arley relating to “*localised concentration of woodland, broad-leaved and mixed*”.⁷
- A hedgerow is proposed to the west to create a field boundary between agricultural land to the west and the Sworton Heath BVI and associated planting.
- Kiosks are not required at BVIs

Site access

2.15.2 The permanent access to the BVI would be taken from the A50 at an existing break in the roadside hedgerow.

2.16 Landscape Design and Vegetation Retention

2.16.1 Existing vegetation to be retained at each of the HAGI and BVI sites is also shown on the Landscape Planting Proposals in **Figures 1-13**.

2.17 Stage Specific LEMPs

2.17.1 The stage specific LEMPs will include landscape specification for the landscape works including, where appropriate, habitat creation and landscape/habitat reinstatement. Reference will be made, but not limited to the following British Standards (BS) and any revisions:

- BS5837:2012 Trees in relation to design, demolition and construction. Recommendations;
- BS 4428:1989 Code of practice for general landscape operations (excluding hard surfaces);
- BS 8545:2014 Trees: from nursery to independence in the landscape – Recommendations; and
- BS 3998:2010 Tree work. Recommendations.

⁷ LUC (2018). Cheshire East Landscape Character Assessment (Online). Available at: <https://www.cheshireeast.gov.uk/planning/spatial-planning/cheshire-east-local-plan/site-allocations-and-policies/sadpd-examination/documents/examination-library/ED10-Cheshire-East-LCA.pdf>

2.17.2 The stage specific LEMPs will include detailed 'contract ready' Landscape Plans, suitable for implementation of the works for each of the HAGIs and BVIs.

2.17.3 The stage specific LEMP will also include:

- Landscape specification/method statement describing the landscape construction works including the stages of implementation:
 - ▶ Site clearance and ground preparation / cultivation and reference to soils management in the stage specific Soils Management Plan (SMP).
 - ▶ Provision of protection including rabbit / stock proof fencing and gates where required.
 - ▶ Planting and provision of tree stakes, ties, guards etc.
 - ▶ Planting procurement, delivery and planting.
 - ▶ Provision of watering, water retention granules, fertiliser and / or mulch where required.
 - ▶ Provision of hard landscape features including stock fencing (post and rail / post and wire fencing) gates, stiles, hard surfacing and other boundary features, including walls and retaining elements where required.
- Plant schedule - detailing number of plants / density / size and species together with grass and wildflower seed mixes. The trees and shrubs planted will be of a range of sizes (including whips, feathered trees, light standards and standards) to ensure that there is a good structure and rapid establishment.
- Landscape programme.
- Landscape management, including a maintenance and monitoring plan to cover years one to ten to ensure the establishment of the landscape proposals.

2.17.4 The landscape specification and management and monitoring plans will also be prepared in accordance with Cadent's own documentation as follows:

- SHES Management Procedure for: Land Management and Biodiversity (2023) (Reference CAD/SHED/PM/22);
- Specification for Landscape Works (2020) (Reference GD/SP/LAN/1); and
- Management Procedures for Maintenance of Landscaped Sites (2020) (Reference GD/SP/LAN/2).

Programme of Landscape Works and Advance Planting

2.17.5 A programme of landscape works would be provided setting out the programme for planting according to relevant planting seasons.

2.17.6 Opportunities would be sought for advance planting prior to construction where feasible to allow trees to establish during the construction works and in advance of completion, with the remainder being delivered following the completion of the HAGIs and BVIs and the decommissioning of temporary construction compounds.

Species Selection and Growth Rates

2.17.7 Species selection will be confirmed as part of the stage specific LEMP and would be restricted to the use of species selected from **Table 2.1**, to suit the local environmental and soil conditions where the plants are to be planted and chosen to meet to design principles and in particular the following objectives:

- Ecological objectives for habitat creation and enhanced biodiversity;
- Landscape objectives to support the landscape design principles for amenity, screening and enhanced landscape character; and
- Provide reasonable climate change resilience according to their location within the detailed landscape plan.

2.17.8 Planting will include a mix of native tree species and 'honorary native' or 'advancing native'. These are species that are naturalised in Britain or those which are native to Britain but not to the North West of England. The planting of a proportion of non-native or 'exotic' trees may also be proposed in suitable locations (excluding native woodland). Incorporating these species will increase diversity, and resilience to pests, diseases and climate change.

Table 2.1 Woody species available for use in mitigation planting

Species mix reference	Mix description	Species	Common name
A	Native Species for use in tree, group and woodland planting	<i>Acer campestre</i>	Field Maple
		<i>Alnus glutinosa</i>	Alder
		<i>Betula pendula</i>	Silver Birch
		<i>Betula pubescens</i>	Downy Birch
		<i>Carpinus betulus</i>	Hornbeam
		<i>Pinus sylvestris</i>	Scots Pine
		<i>Populus alba</i>	White Poplar
		<i>Populus nigra subsp. betulifolia</i>	Black Poplar
		<i>Prunus avium</i>	Wild Cherry
		<i>Quercus petraea</i>	Sessile Oak
		<i>Quercus robur</i>	Pedunculate Oak
		<i>Tilia cordata</i>	Small-leaved Lime
		<i>Tilia platyphyllos</i>	Large-leaved Lime

Species mix reference	Mix description	Species	Common name
B	Additional native species for use in group and woodland and hedgerow planting	<i>Cornus sanguinea</i>	Dogwood
		<i>Corylus avellana</i>	Hazel
		<i>Crataegus monogyna</i>	Hawthorn
		<i>Cytisus scoparius</i>	Broom
		<i>Euonymus europaeus</i>	Spindle
		<i>Frangula alnus</i>	Alder Buckthorn
		<i>Ilex aquifolium</i>	Holly
		<i>Juniperus communis</i>	Common Juniper
		<i>Ligustrum vulgare</i>	Wild Privet
		<i>Malus sylvestris</i>	Crab Apple
		<i>Populus tremula</i>	Aspen
		<i>Populus x canescens</i>	Grey Poplar
		<i>Prunus padus</i>	Bird Cherry
		<i>Prunus spinosa</i>	Blackthorn
		<i>Pyrus communis</i>	Common Pear
		<i>Rhamnus cathartica</i>	Buckthorn
		<i>Salix alba</i>	White Willow
		<i>Salix caprea</i>	Goat Willow
		<i>Salix cinerea</i> subsp. <i>Oleifolia</i>	Grey Willow
		<i>Salix pentandra</i>	Bay Willow
		<i>Salix viminalis</i>	Osier
		<i>Sambucus nigra</i>	Elder
		<i>Sorbus aucuparia</i>	Rowan
		<i>Sorbus torminalis</i>	Wild Service-tree
		<i>Taxus baccata</i>	Yew

Species mix reference	Mix description	Species	Common name
C	Additional non-native and naturalised species for specimen tree planting	<i>Viburnum lantana</i>	Wayfaring-tree
		<i>Viburnum opulus</i>	Guelder Rose
		<i>Acer pseudoplatanus</i>	Sycamore
		<i>Acer platanoides</i>	Norway maple
		<i>Aesculus hippocastanum</i>	Horse Chestnut
		<i>Alnus cordata</i>	Italian Alder
		<i>Castanea sativa</i>	Sweet Chestnut
		<i>Corylus colurna</i>	Turkish Hazel
		<i>Crataegus laevigata</i>	Midland Hawthorn
		<i>Cedrus deodara</i>	Deodar Cedar
		<i>Cedrus libani</i>	Cedar of Lebanon
		<i>Cedrus atlantica</i> var. <i>glauca</i>	Blue Atlantic Cedar
		<i>Cupressus macrocarpa</i>	Monterey cypress
		<i>Fagus sylvatica</i> f. <i>purpurea</i>	Copper Beech
		<i>Juglans nigra</i>	Black Walnut
		<i>Liriodendron tulipifera</i>	Tulip tree
		<i>Pinus nigra</i>	Austrian pine
		<i>Pinus nigra</i> subsp. <i>laricio</i>	Corsican Pine
		<i>Quercus ilex</i>	Holm oak
		<i>Quercus rubra</i>	Red oak
		<i>Sorbus aria</i>	Whitebeam
		<i>Tilia x europaea</i>	Common Lime
D		<i>Castanea sativa</i>	Sweet Chestnut

Species mix reference	Mix description	Species	Common name
	Additional non-native and naturalised species for group and woodland planting	<i>Crataegus laevigata</i>	Midland Hawthorn
		<i>Larix decidua</i>	European Larch
		<i>Malus x domestica</i>	Apple
		<i>Mespilus germanica</i>	Medlar
		<i>Prunus domestica</i>	Plum
		<i>Pyrus communis</i>	Pear
		<i>Sorbus aria</i>	Whitebeam
		<i>Tilia x europaea</i>	Common Lime
E	Additional exotic species for tree and group planting in response to climate resilience	<i>Acer griseum</i>	Paperbark maple
		<i>Araucaria Araucana</i>	Monkey Puzzle Tree
		<i>Cercidiphyllum japonicum</i>	Katsura tree
		<i>Eucalyptus gunnii</i>	Cider gum
		<i>Liriodendron chinense</i>	Chinese tulip tree
		<i>Metasequoia glyptostroboides</i>	Dawn redwood
		<i>Parrotia persica</i>	Persian ironwood
		<i>Pterocarya fraxinifolia</i>	Caucasian wingnut
		<i>Sciadopitys verticillate</i>	Japanese umbrella pine
		<i>Zelkova serrata</i>	Japanese zelkova

2.17.9 The Forestry Commission's Bulletin 62 Silviculture of Broadleaved Woodland⁸, reports that growth rates of native species, likely to be included in the planting plan, can range from approximately 10-50cm per year for Oak (*Quercus robur*) and to up to approximately 1-2m per year for willows (*Salix fragilis*) and poplars (*Populus nigra*); according to variable environmental conditions such as soil type

⁸ Forestry Commission (1984). Bulletin 62 Silviculture of Broadleaved Woodland. (online) Available at: <https://www.forestryresearch.gov.uk/publications/archive-silviculture-of-broadleaved-woodland/>

and weather. This broadly accords with the IEMA Quality Mark Article Predicting tree and hedge growth⁹, which states:

“Given that most UK mitigation planting will be of mixed natives in largely unexposed conditions, an average annual growth of 30cm per year in the first five years can normally be assumed.

Once established the plants’ growth rate will increase and this can be anticipated to reach around 50cm a year for the next 10 years. If planted as transplants, this gives a height of 2–2.5m in the first year and 7–7.5m after 15 years.”

- 2.17.10 Differences in maintenance, for example weeding / mulching or no weed control can result in further variability on growth rates. For example, the Forestry Commission (Growing broadleaves for timber, 1993) reports the height of an Oak transplant at Year five can vary between 0.9m (unprotected) to 1.77m (with tree guard).
- 2.17.11 Planting illustrated in any photomontages for the Project, have therefore illustrated proposed planting heights for woodland conservatively at between 7-7.5m high at Year 15.

Landscape management

- 2.17.12 Landscape management would include both maintenance and monitoring for years one - ten to ensure the establishment of the landscape proposals.

Maintenance

- 2.17.13 The maintenance works would include a specification and programme of maintenance works for up to ten years covering items such as weeding / mulching, watering, fertiliser, repair to plant protection and replacement of failed plants as required.

Monitoring

- 2.17.14 Monitoring would be conducted twice a year for up to five years and thereafter annually, during the summer for years five to ten.
- 2.17.15 At each monitoring visit a proforma (format to be specified in the stage specific LEMP) would be provided setting out items to be checked and confirming the results of the monitoring activity. All monitoring proformas would be made available to the relevant planning authority, and any adaptive management measures would be discussed and agreed with them prior to implementation.
- 2.17.16 Should monitoring identify issues (e.g., excessive weed control, fencing installation / repair, tree guard removal / replacement), additional / adaptive management measures would be employed to ensure successful plant establishment.

⁹ Institute of Environmental Management & Assessment (IEMA) (2013). IEMA Quality Mark Article, Predicting tree and hedge growth. (online) Available at: <https://www.iema.net/articles/predicting-tree-and-hedge-growth#:~:text=Predicting%20plant%20growth%20and%20height&text=Much%20can%20be%20learned%20from,vegetation%20shaped%20by%20the%20wind%3F>

- 2.17.17 Further operational monitoring of the restricted planting zone for the pipeline corridor would be undertaken by Cadent to maintain the viability of the pipeline corridor and removing self-seeded trees that do not comply with **Appendix A: Planting and Management Guidance for Underground Pipelines**.
- 2.17.18 Further details on specific habitat management are provided in **Section 5: Monitoring and Management**.

3. Habitat Creation

3.1.1 Habitat creation within this Outline LEMP is defined as the delivery of habitat types in areas that currently do not support them (for example, planting of woodland on an area currently supporting an agriculturally improved grassland). For the Project, this refers to:

- areas surrounding the HAGIs and BVIs where landscaping is proposed to screen the above ground equipment, aid integration with the surrounding landscape and create habitats; and
- areas identified along the pipeline corridors where habitat creation is required to compensate for permanent habitat loss. Discussion with landowners is ongoing to agree suitable sites, with a focus on connecting areas of existing habitat (e.g. woodland) or designated wildlife sites.

3.1.2 Elsewhere, within areas that are to be affected by the Project, habitats and landscape features (such as hedgerows) would be reinstated (see **Section 4**) and returned to landowners for them to resume their current activities within these areas (such as farming).

3.1.3 The habitats to be established around the HAGIs and BVIs are shown in **Figures 1 to 13** as follows:

- HPP HAGI:
 - ▶ No habitat creation proposed.
- Rocksavage HAGI:
 - ▶ Wildflower meadow: ~1.3ha
- Runcorn HAGI:
 - ▶ Low maintenance wildflower/grassland: ~1.9ha;
 - ▶ Native hedgerow: ~180m.
- Central Hub HAGI:
 - ▶ Woodland: ~0.4ha;
 - ▶ Wildflower grassland: ~0.8ha; and
- Higher Walton (HWH2) HAGI:
 - ▶ Woodland: ~0.8ha;
 - ▶ Scrub: ~0.5ha; and
 - ▶ Wildflower grassland: ~1.2ha.
- Higher Walton (HWH8) HAGI:
 - ▶ Woodland: ~3.0ha
 - ▶ Wildflower grassland: ~1.8ha; and

- ▶ Native hedgerow: ~315m
- Clock Face HAGI:
 - ▶ Woodland: ~2.4ha;
 - ▶ Woodland edge: ~0.6ha; and
 - ▶ Wildflower grassland: ~1.3ha;
- Warburton HAGI:
 - ▶ Woodland: ~0.3ha;
 - ▶ Woodland edge: ~0.2ha;
 - ▶ Wildflower grassland: ~0.7ha; and
 - ▶ Native hedgerow: ~260m.
- Partington (P1) HAGI:
 - ▶ No habitat creation proposed.
- Partington (P2) HAGI:
 - ▶ Woodland: ~0.4ha;
 - ▶ Wildflower grassland: ~0.4ha; and
 - ▶ Native hedgerow: ~440m
- Hydrogen Storage Facility HAGI
 - ▶ Woodland: ~0.8ha; and
 - ▶ Wildflower grassland: ~0.9ha.
- Hartford BVI
 - ▶ Wildflower grassland: ~1.1ha.
- Sworton Heath BVI:
 - ▶ Woodland: ~1.1ha;
 - ▶ Woodland edge: ~0.6ha; and
 - ▶ Wildflower grassland: ~1.5ha.

4. Landscape and Habitat Reinstatement

- 4.1.1 Landscape elements and habitats within areas that will be subject to temporary loss during the installation of pipeline will have habitats and associated landscape elements (such as hedgerows) reinstated.
- 4.1.2 The reinstatement of habitat will be of the same habitat type and to the same condition, although in landscape terms the reinstatement of landscape elements will take time to mature and new sections of field boundary fencing and / or hedgerow will be apparent post construction. The reinstatement to pre-existing state is to provide the landowner the opportunity to carry on usual activities (such as arable farming, grazing etc.) following installation of the pipeline. Should landowners express an interest in the area affected (or other areas within their local landholding) being enhanced for biodiversity this could be delivered through the commitment made to Biodiversity Net Gain (BNG).
- 4.1.3 The stage specific LEMPs will detail the landscape elements and habitats to be reinstated; including species mixes, planting densities and extents as set out in **Section 2.17: Stage specific LEMPs**. Each stage specific LEMP will also include a delivery schedule and details of the monitoring and management arrangements for each habitat type/area.
- 4.1.4 The approach to different landscape elements and habitat types is described below.

4.2 Arable Fields and Pasture

- 4.2.1 The reinstatement of agricultural fields will be undertaken in discussion with landowners to ensure soil structure and commercial seed mixes (especially for improved pastures) are in keeping with the remainder of the field in question. An Outline Soils Management Plan will be prepared for the construction phase, in line with the embedded measures set out in **Chapter 13: Agriculture and Soil Resource** of the Draft ES, and will be submitted as part of the DCO application documents.
- 4.2.2 Habitat reinstatement of agricultural fields will be monitored for a period of ten years. Any remediation required post initial restoration will be driven by commercial considerations of farming practice (land drainage is not functioning as previously) as opposed to habitat quality for biodiversity. Should any issues be identified, a programme of suitable works (such as alterations to land drains) will be agreed with the affected party.

4.3 Scrub

- 4.3.1 Where scrub occurs in the landscape and coincides with the final pipeline corridor or construction compounds, it will be assessed prior to any vegetation clearance occurring, with size of shrubs, type of shrubs and soil type considered before being cut and removed from the working area.

- 4.3.2 Following the completion of construction works in that area, the scrub will be replanted with new plants or temporarily translocated stock returned to its original position in the first available winter period, subject to appropriate weather and ground conditions. Following the return of translocated scrub or planting of new shrubs, fencing would be erected to protect the area from herbivory. Weed control (spot treatment of undesirable species or dense grass cover) would be undertaken in each year for the first five years of the establishment phase; with the need for weed control assessed periodically for the remaining five years of the establishment phase (i.e., establishment phase is to be ten years in total). At planting, water retention granules would be included in the trench / pit and a watering plan devised for each location as necessary (based on ground conditions). Watering would occur at the time of planting and over the following six months should there be no rain for a period of five days.

4.4 Groups of Trees and Woodland

Reinstatement rates

- 4.4.1 The proposed reinstatement rates for groups of trees and woodland are set out in **Table 4.1** with further details set out in **Appendix C: Arboricultural Impact Assessment** of the **Draft ES**. The rate at which trees would be replaced would be calculated as a function of their current stem size and with regard to groups of trees, would be applied based on the median stem size of the range recorded within each group. It may be necessary for additional survey detail to be gathered to inform the final mitigation calculations based on a detailed design.

Table 4.1 Representative Group and Woodland replacement rates

Stem diameter range	Area of replacement planting
Small ($\leq 300\text{mm}$)	1:1
Medium ($> 300\text{mm}$ to $\leq 900\text{mm}$)	1:1.1 (+10%)
Large ($\geq 900\text{mm}$)	1:1.2 (+20%)
Unsurveyed	1:1.1 (+10%)

Design Principles and Planting Mixes

- 4.4.2 The design of replacement tree groups and woodland planting would aim to replace or recreate the benefits provided by trees that were removed. This would vary depending on location and the characteristics of individual tree groups and woodland. **Table 4.2** describes the design principles that would be applied depending on the primary qualities of each tree group or woodland to be removed with mixes A-E set out in **Table 2.1**. The primary qualities are based on the categorisation sub-categories provided by BS5837^{Error! Bookmark not defined.}. For features that fall into more than one sub-category, judgement will be exercised on a case-by-case basis to determine which should take priority during mitigation design.

Table 4.2 Mitigation principles for removed trees groups and woodland

Feature type	Mainly arboricultural qualities	Mainly landscape qualities	Mainly habitat qualities
Group	Replace with species Mix A and/or B as close to original location as possible. Occasional use of Mix C and E.	Replace with species Mix B and/or D and as close to original location as possible.	Replace with species Mix B to buffer, connect or augment existing habitats.
Woodland	Replace with species Mix A and B as close to original location as possible.	Replace with species Mix A, B and D and as close to original location as possible.	Replace with species Mix B to buffer, connect or augment existing habitats.

- 4.4.3 The design principles described for mitigation planting seek to maximise the amount of new planting that would be delivered at or as close to the same location as possible from the trees which are lost (i.e. delivered in-situ).
- 4.4.4 Mitigation that cannot be delivered in-situ includes the removal of tree groups and woodland within the footprint of the proposed permanent HAGIs and BVIs. It also includes the removal of trees on top of the pipelines where these cannot be replaced in-situ because the requirement to replant with the same or a comparable species would create a future management issue (see **Appendix A: Planting and Management Guidance for underground pipelines**). There may also be restrictions on new planting imposed by existing structures that prevent the replacement of the existing canopy area of removed trees, for example where they overhang hard-surfacing or water bodies). Finally, the planting of trees over a greater area than existing groups may be prevented or be undesirable due to other land use or constraint. Mitigation for the removal of such trees will be delivered via 'ex-situ' planting (planting of replacement trees using the same rates and species mixes but in other locations).
- 4.4.5 The total ex-situ liability would be calculated based on the total planting liability (as per the above ratios) minus the in-situ planting. This remaining planting would be delivered according to the following hierarchy:
- As close as possible within the Draft Order Limits on land owned by the same landowner;
 - As close as possible within the Draft Order Limits on land owned by an adjacent landowner;
 - On other land within the Draft Order Limits;
 - As close as possible outside the Draft Order Limits; and
 - On other land within the region (e.g. Local Planning Authorities or Nature Reserves).
- 4.4.6 In all instances, ex-situ tree planting would seek to maintain or enhance local habitat connectivity where possible.

4.5 Individual Trees

Reinstatement Rates

- 4.5.1 With regard to individual trees, these may present as individual trees within hedgerows or as street trees within the Draft Order Limits. **Table 4.3** provides representative examples of the replacement rates that could apply to trees in different size brackets with further details set out in **Appendix C: Arboricultural Impact Assessment** of the **Draft ES**. The rate at which trees would be replaced would be calculated as a function of their current stem size

Table 4.3 Tree replacement rates

Stem diameter	Potential number of replacement trees per tree removed
100mm	1
200mm	1
300mm	1
400mm	2
500mm	3
600mm	4
700mm	6
800mm	8
900mm	9
1000mm	12
1100mm	14
>1200mm	16

Design Principles and Planting Mixes

- 4.5.2 The design of replacement trees would aim to replace or recreate the benefits provided by trees that were removed. This would vary depending on location and the characteristics of individual trees. **Table 4.4** describes the design principles that will be applied depending on the primary qualities of each tree removed with mixes A-E set out in **Table 2.1**. The primary qualities are based on the categorisation sub-categories provided by BS5837^{Error! Bookmark not defined.}. For features that fall into more than one sub-category, judgement has been exercised on a case-by-case basis to determine which should take priority during mitigation design.

Table 4.4 Mitigation principles for removed individual trees

Feature type	Mainly arboricultural qualities	Mainly landscape qualities	Mainly habitat qualities
Tree	Replace with species Mix A and as close to original location as possible. Occasional use of Mix C and E	Replace with species Mix A and/or C and as close to original location as possible. Occasional use of Mix C and E	Replace with species Mix A to buffer, connect or augment existing habitats

- 4.5.3 The location, species, sizes and temporary support and protective measures for replacement trees will be shown on detailed planting plans produced in response to a detailed design and included in the stage specific LEMPs.
- 4.5.4 The design principles described for mitigation planting maximise the amount of new planting that would be delivered at or as close to the same location as possible from the trees which are lost. This means that the vast majority of mitigation can be embedded as part of the DCO and delivered in-situ.
- 4.5.5 It is likely that sufficient opportunities exist within the Draft Order Limits and surrounds to plant the required number of individual tree replacements via a combination of in-situ and ex-situ locations. The total number is low, relative to the scale of the Project and the suitable planting locations opportunities. This would principally be within new or reinstated hedgerow or field margins.
- 4.5.6 Whilst the introduction of young trees, in contrast to a mature or single age structure may be noticeable, it would also bring benefits of increased diversity of age structure, habitat and succession or longevity of the landscape element which would otherwise decline if it became over mature.

4.6 Hedgerows

Reinstatement Ratios

- 4.6.1 Hedgerows occur regularly along the length of the pipeline corridors forming features of both landscape and ecological value. The effect of the crossings on hedgerows would differ dependent on the exact location. Hedgerows may be removed and reinstated with new plants or temporarily translocated to a pre-prepared planting trench and returned to its original position in the first available planting period.
- 4.6.2 Hedges would be replaced at a rate of at least 1:1 by length. Where the temporary loss of hedgerow occurs within existing hedgerows that are already fragmented, gapping-up would take place (where appropriate to do so) to create continuous lengths of hedgerow.

Design principles and planting mixes

- 4.6.3 The design of replacement hedgerow planting would aim to replace or recreate the benefits provided by hedgerows or section of hedgerow that were removed. This would vary depending on location and the characteristics of hedgerow.
- 4.6.4 Hedgerows would all be replaced or gapped up with species Mix B as set out in **Table 2.1**.
- 4.6.5 Following the return of translocated hedgerow or planting of new whips, fencing would be erected to protect the area from herbivory. Weed control (spot treatment of undesirable species or dense grass cover) would be undertaken in each year for the first five years of the establishment phase; with need for weed control assessed periodically for the remaining five years of the establishment phase (establishment phase is to be ten years in total). At planting, water retention granules would be included in the trench / pit and a watering plan devised for each location as necessary (based on ground conditions). Watering would occur at the time of planting and over the following six months should there be no rain for a period of five days.
- 4.6.6 All hedgerows temporarily lost would be reinstated within two years of its loss. The reinstatement would occur during the first available planting period.
- 4.6.7 The hedgerow would be monitored twice yearly in years one, two, three, four and five, and annually (in spring / summer) in years six to ten following reinstatement. Should any of the planted or translocated sections fail in this period they would be replaced with plants of a suitable size in the first planting season following the monitoring visit. Further, should other issues be identified (for example, excessive weed growth, herbivory damage etc.) additional measures would be employed to ensure the reinstatement is successful.
- 4.6.8 Management of hedgerow would take place over the operational life of the assets to avoid root damage to the underground pipeline. Every tenth year following establishment, and if necessary, the hedgerow would be monitored and large tree species within the cable wayleave cut down or reduced in size to prevent larger trees becoming established (see **Annex A: Planting and Management Guidance for Underground Electrical Cables**).

4.7 Grasslands (Other Than Improved Grasslands)

- 4.7.1 Prior to the commencement of construction, areas of grassland (other than improved grassland) within the working area would be subject to National Vegetation Classification (NVC) survey. Those grasslands that were identified as meeting the criteria of a priority grassland in Natural England's Technical Information Note TIN110¹⁰ would be subject to restoration using the existing seed bank (as opposed to sowing a seed mixture). The exception to this would be floodplain grasslands that are often characterised by areas of intensively managed

¹⁰ Natural England (2012). Assessing whether created or restored grassland is a BAP Priority Habitat (TIN110). (online) Available at: <https://webarchive.nationalarchives.gov.uk/ukgwa/20150902172513/http://publications.naturalengland.org.uk/publication/1649037>

pastures. These areas would be sown with an appropriate commercial mix as agreed with the landowner.

- 4.7.2 Where reinstatement is from the existing seed bank, the top layer (~10cm) of the topsoil (referred to here as 'seed bank soil') would be removed and stored separately to the remainder, which in turn would be stored separately from the subsoil in accordance with an Outline Soils Management Plan. The seed bank soil would not be seeded when stored and would be held in a stockpile for as short a time as possible (aim of less than six months). This soil would then be dressed back onto the area it was removed from following completion of temporary construction works.
- 4.7.3 In areas of new wildflower meadow (i.e. where wildflower meadow is replacing existing alternative habitat or land use, such as within the restricted planting zones) these will be sown with an appropriate wildflower/grassland seed mix, based on the soil type and local diversity. Soils will be tested in advance, and a suitable methodology will be employed to prepare a growing medium aimed at successful sward establishment.
- 4.7.4 In most cases, this will require limiting the nutrient content of the upper soil layers. Often this is achieved by building up to the finished level with unimproved subsoil and omitting topsoil entirely, particularly in areas previously under agricultural cultivation.
- 4.7.5 Monitoring the establishment of grassland would take place annually for a period of ten years. Where necessary, spot treatments would be applied to undesirable species to facilitate the development of a diverse sward. Management of the grassland would follow that of current use (such as grazing would be expected in areas currently grazed), with planning for each regime being determined for each individual area. Where necessary, adaptive management measures (such as over-seeding etc.) would be implemented to ensure diversity of the sward is maintained.

4.8 Watercourse and Wet Ditch Crossings

- 4.8.1 Watercourses and wet ditches that would be crossed using open cut techniques would be affected for relatively short periods.
- 4.8.2 Reinstatement works to watercourses may require measures to stabilise the banks and prevent erosion. Reinstatement measures would avoid hard structural elements (such as gabion baskets, sheet piling and concrete filled bags) and instead, geotextiles such as coir rolls, coir matting and GeoJute would be used in conjunction with seeding of an appropriate grass mix or planting. Reinstatement of watercourse channel bed would use sediment of similar size to the natural bed, and of the same geology. Where possible, excavated material from the channel bed should be kept separate from other excavated material and used for reinstatement of the channel bed.
- 4.8.3 Bankside vegetation would either be left to regenerate naturally where rough grassland or ruderal vegetation fringes are dominant, sown with an appropriate seed mix where the ditch is fringed by agriculturally managed habitats or planted with scrub where these habitats lie adjacent to the watercourse.

4.9 Hard Landscape Features

- 4.9.1 Hard landscape features include non-vegetative landscape elements such as fencing, walls, gates, stiles and footpath surfacing.
- 4.9.2 The reinstatement of hard landscape features would refer to a condition survey undertaken prior to the site clearance as part of the pipeline corridor setting out works. This would confirm the type of boundary fencing and the condition of the hard landscape feature to be reinstated with new fencing for example of matching or closely matching type (such as post and rail fencing to replace existing post and rail fencing and tie into existing fencing), unless agreed otherwise with the landowner or required to protect new reinstated planting (such as rabbit proof fencing).
- 4.9.3 The Outline Public Right of Way Management Plan (PRoWMP) provides a summary of the temporarily affected PRoWs. Reinstatement of public access features such as new replacement gates, cattle grids and stiles would follow the same reinstatement approach with a condition survey undertaken prior to site clearance, which would be reflected in the reinstatement provided.
- 4.9.4 Where the boundary feature has interest and/or historic value as a landscape element, for example, natural stone paving slabs or post marker / feature, its condition would be recorded, and specific reinstatement and reporting plan provided as part of the stage specific LEMP. This is likely to include the taking down, safe storage and reinstatement of the original features post construction.
- 4.9.5 Where the hard surfacing of a PRoW needs to be reinstated, this would also be subject to a condition survey undertaken prior to the site clearance as part of the pipeline corridor setting out works. Reinstatement would be undertaken to match or closely match the original, unless agreed otherwise following landowner consultation and agreement.
- 4.9.6 Hard landscape features would be monitored for a period of ten years (including a wet weather check). Where necessary, defective field boundary, access features and surfacing would be replaced (such as cracked fencing / paving or hard surfacing that has sunk and is subject to regular puddling).

5. Monitoring and Management

- 5.1.1 Landscape and habitat management would include both maintenance and monitoring for ten years to ensure establishment.
- 5.1.2 All habitats created and reinstated would be monitored and managed for a period of no less than ten years. Where habitats are to count towards the commitment for BNG, this period would be no less than 30 years¹¹. Each stage specific LEMP would provide this information in a monitoring and management schedule.
- 5.1.3 Newly planted vegetation would be monitored at least once annually for a period of ten years. This monitoring effort would focus on ensuring that any failed habitat creation measures (e.g., die off of planted trees, excessive weed growth) is remedied at the earliest possible opportunity and that appropriate management actions are being taken to ensure that the target condition of the habitats would be reached. The monitoring visits would be undertaken by a suitably qualified and experienced practitioner who would then have the responsibility to identify and organise delivery of:
- Replacement plantings for any failed trees or shrubs; and
 - Adaptive management measures aimed at achieving the target conditions of each habitat specified (for example, additional weed control, fencing installation / repair, tree guard removal / replacement).
- 5.1.4 At each monitoring visit, a proforma (format to be specified in the detailed LEMP) would be completed that would detail the status of each habitat created and any measures necessary to deliver effective adaptive management. All monitoring proformas would be made available to the relevant planning authority, and any adaptive management measures would be discussed and agreed with them prior to implementation. As each habitat reaches the time within which target habitat condition should be reached, an assessment against the relevant criteria would be provided.
- 5.1.5 The management of each habitat type at the HAGIs and BVIs would follow standard practices for delivering habitats with the appropriate structure and diversity required to maximise biodiversity opportunity. These measures would be specified in the stage specific LEMP to be provided.
- 5.1.6 Reinstated habitats would be managed to return them to the same state as at the time of temporary loss. Within agricultural settings the management and monitoring would be cognisant of the commercial activities and landowner management of the adjacent areas (sections of hedgerows or parts of fields subject to reinstatement would need to be managed in the same way as contiguous areas being actively managed by the landowner).

¹¹ Department for Environment, Food & Rural Affairs and Natural England (2024). Creating a habitat management and monitoring plan for BNG. (online). Available at: <https://www.gov.uk/guidance/creating-a-habitat-management-and-monitoring-plan-for-biodiversity-net-gain>

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<https://webarchive.nationalarchives.gov.uk/ukgwa/20150902172513/http://publications.naturalengland.org.uk/publication/1649037>

Figures

NO PLANTING PROPOSED:
Urban nature of site restricts planting
opportunities.
Existing screening exists for the industrial site.

Hedgerow to be replaced
following construction works

PRoW W1-Elton FP5

- Key
- Draft Order Limits
 - Limit of Deviation
 - HAGI/BVI outer security fence
 - Restricted Planting Zone
 - Proposed access
 - Indicative pipeline alignment
 - Zone of limited planting
 - Existing trees
 - Root protection zone of existing trees
 - Existing hedge
 - Existing hedge removed and replaced elsewhere within the Order Limits
 - Existing Public Right of Way

This figure outlines the broad principles of the planting proposals but may be subject to minor changes at detailed design stage depending on the final footprint of the above ground infrastructure and pipeline alignment within the LoD. Planting within Pipeline Restricted Planting Zones shall adhere to "Planting and Management Wayleaves for underground pipelines" Presented at Appendix A'



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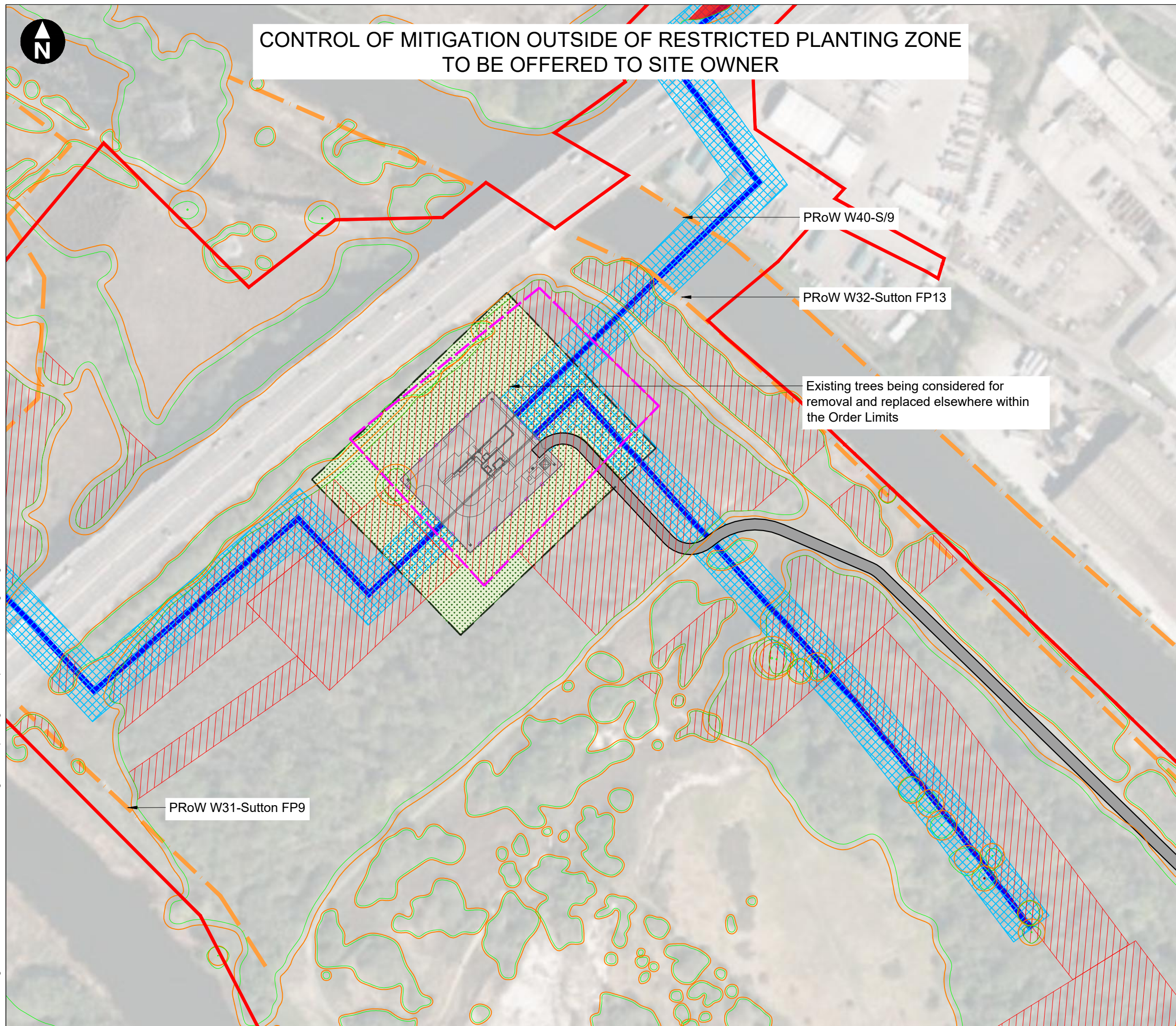
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852552-WSPE-IA-L3-FG-LV-84706

Figure 1
HPP HAGI Outline Landscape Planting Proposals

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Key

- Draft Order Limits
- Limit of Deviation
- HAGI/BVI outer security fence
- Restricted Planting Zone
- Proposed access
- Indicative pipeline alignment
- Zone of limited planting
- Existing trees
- Root protection zone of existing trees
- Trees considered for removal
- Wildflower meadow
- Existing hedge removed and replaced elsewhere within the Order Limits
- Existing Public Right of Way

This figure outlines the broad principles of the planting proposals but may be subject to minor changes at detailed design stage depending on the final footprint of the above ground infrastructure and pipeline alignment within the LoD. Planting within Pipeline Restricted Planting Zones shall adhere to "Planting and Management Wayleaves for underground pipelines" Presented at Appendix A'



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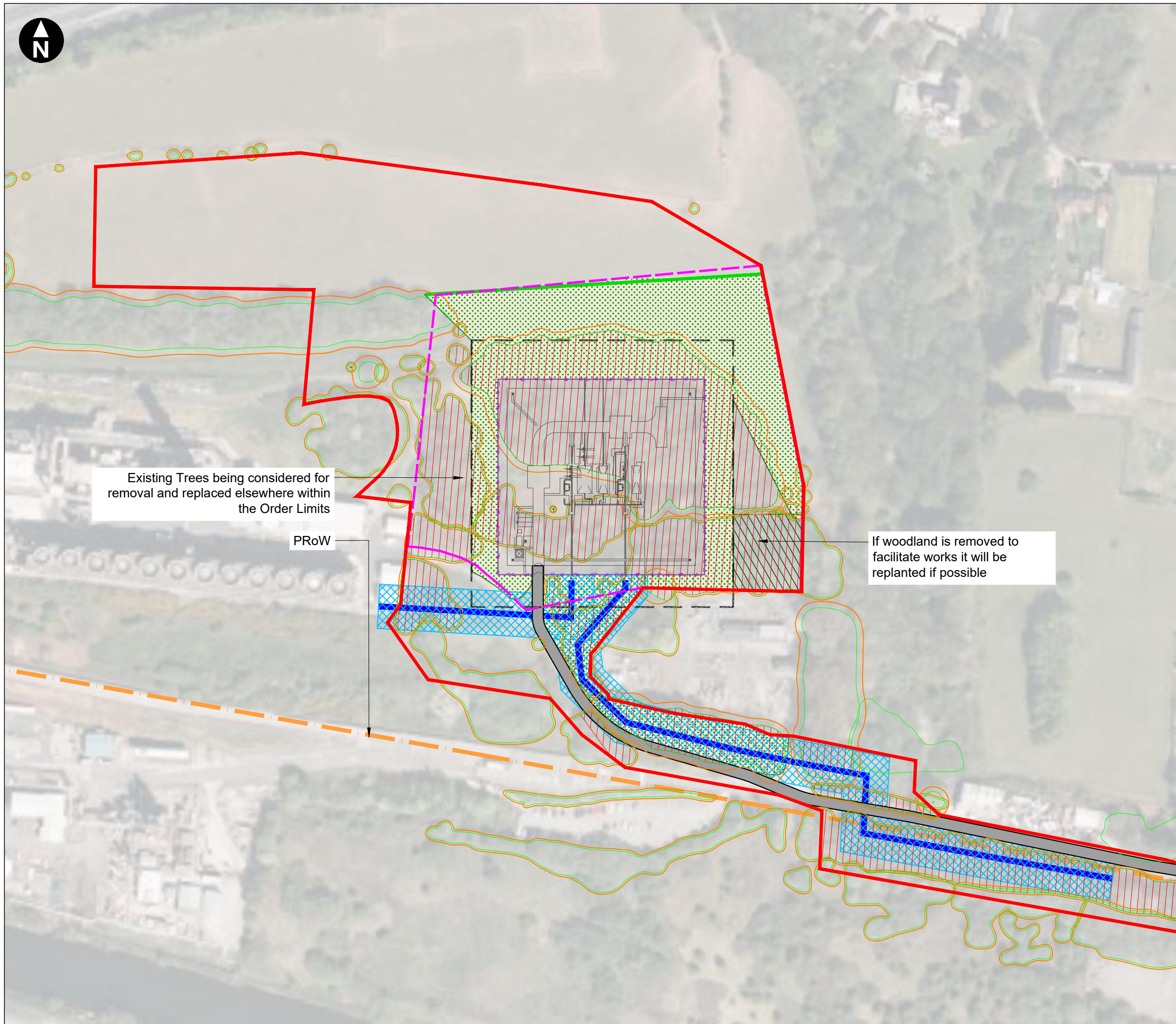
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Figure 2
Rocksavage HAGI Outline Landscape
Planting Proposals

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Key

- Draft Order Limits
- Limit of Deviation
- HAGI/BVI outer security fence
- Restricted Planting Zone
- Proposed access
- Indicative pipeline alignment
- Zone of limited planting
- Existing trees
- Root protection zone of existing trees
- Trees considered for removal
- Wildflower meadow
- Proposed woodland
- Proposed hedge
- Existing hedge
- Existing hedge removed and replaced elsewhere within the Order Limits
- Existing Public Right of Way

This figure outlines the broad principles of the planting proposals but may be subject to minor changes at detailed design stage depending on the final footprint of the above ground infrastructure and pipeline alignment within the LoD. Planting within Pipeline Restricted Planting Zones shall adhere to "Planting and Management Wayleaves for underground pipelines" Presented at Appendix A'

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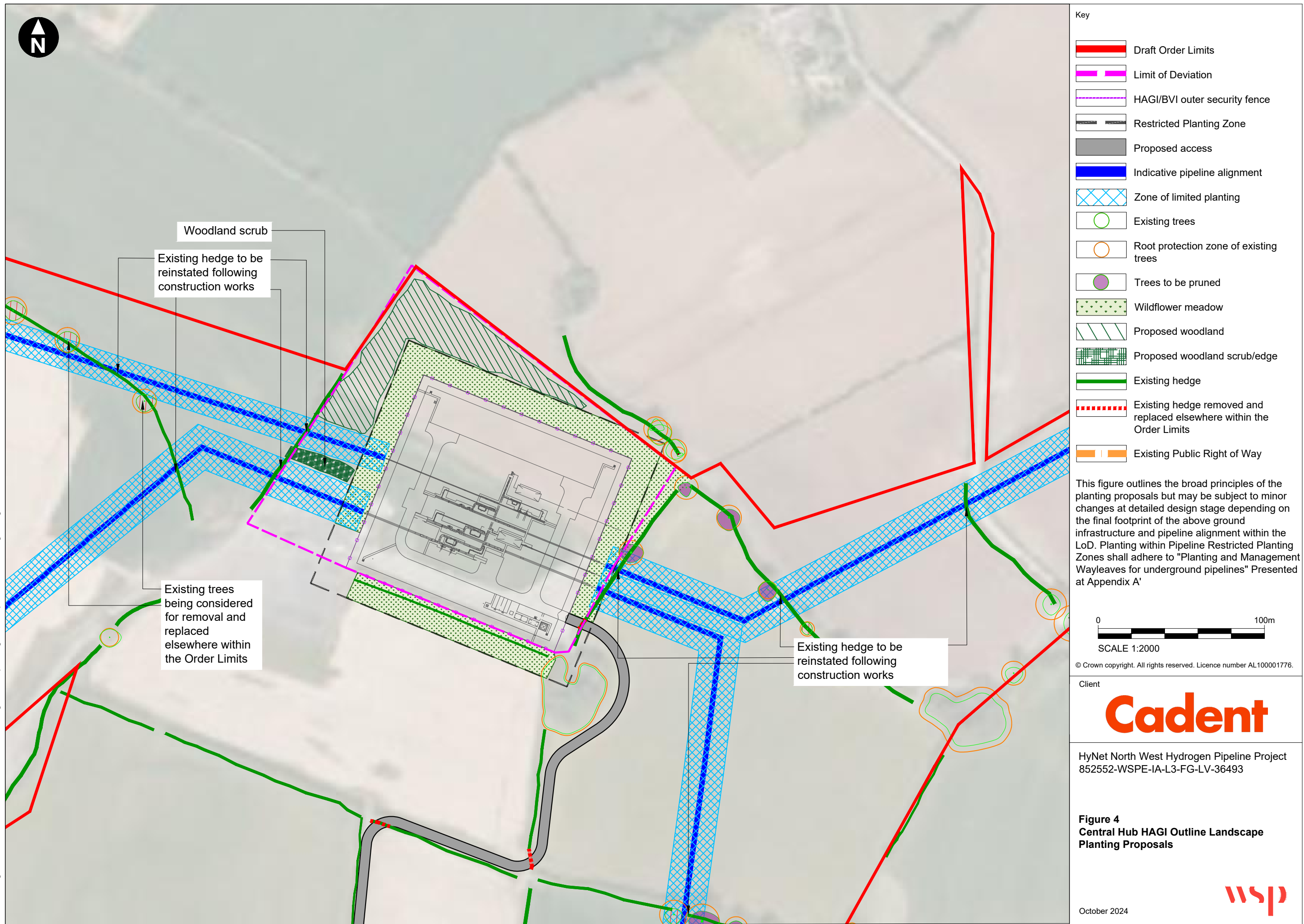
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Figure 3
Runcorn HAGI Outline Landscape
Planting Proposals

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Key

- Draft Order Limits
- Limit of Deviation
- HAGI/BVI outer security fence
- Restricted Planting Zone
- Proposed access
- Indicative pipeline alignment
- Zone of limited planting
- Existing trees
- Root protection zone of existing trees
- Trees to be pruned
- Wildflower meadow
- Proposed woodland
- Proposed woodland scrub/edge
- Existing hedge
- Existing hedge removed and replaced elsewhere within the Order Limits
- Existing Public Right of Way

This figure outlines the broad principles of the planting proposals but may be subject to minor changes at detailed design stage depending on the final footprint of the above ground infrastructure and pipeline alignment within the LoD. Planting within Pipeline Restricted Planting Zones shall adhere to "Planting and Management Wayleaves for underground pipelines" Presented at Appendix A'

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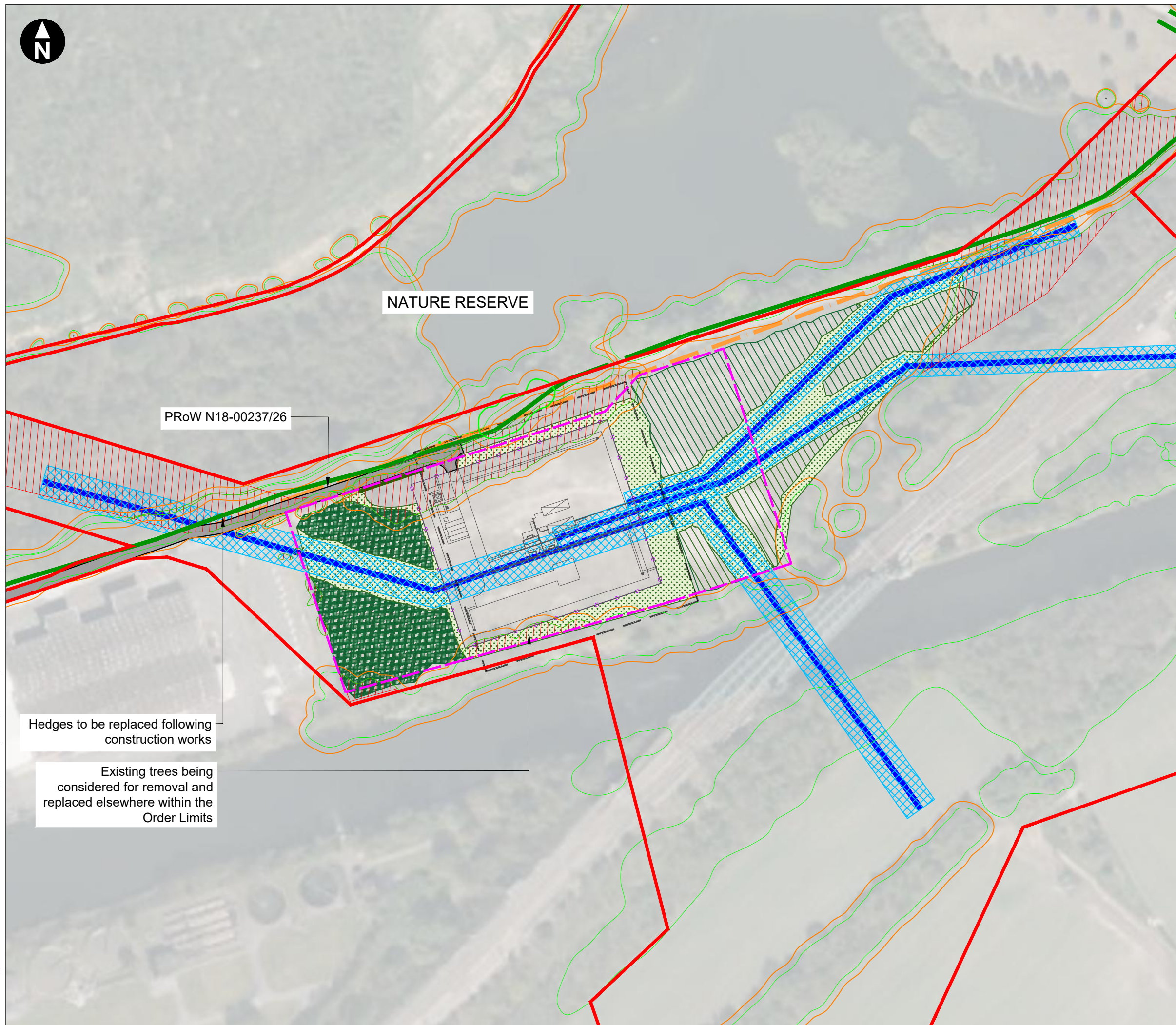
Figure 4
Central Hub HAGI Outline Landscape
Planting Proposals

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Landscape Mitigation Proposals 240930

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Key	
	Draft Order Limits
	Limit of Deviation
	HAGI/BVI outer security fence
	Restricted Planting Zone
	Proposed access
	Indicative pipeline alignment
	Zone of limited planting
	Existing trees
	Root protection zone of existing trees
	Trees considered for removal
	Wildflower meadow
	Proposed woodland
	Proposed woodland edge/scrub
	Existing hedge
	Existing hedge removed and replaced elsewhere within the Order Limits
	Existing Public Right of Way

This figure outlines the broad principles of the planting proposals but may be subject to minor changes at detailed design stage depending on the final footprint of the above ground infrastructure and pipeline alignment within the LoD. Planting within Pipeline Restricted Planting Zones shall adhere to "Planting and Management Wayleaves for underground pipelines" Presented at Appendix A'



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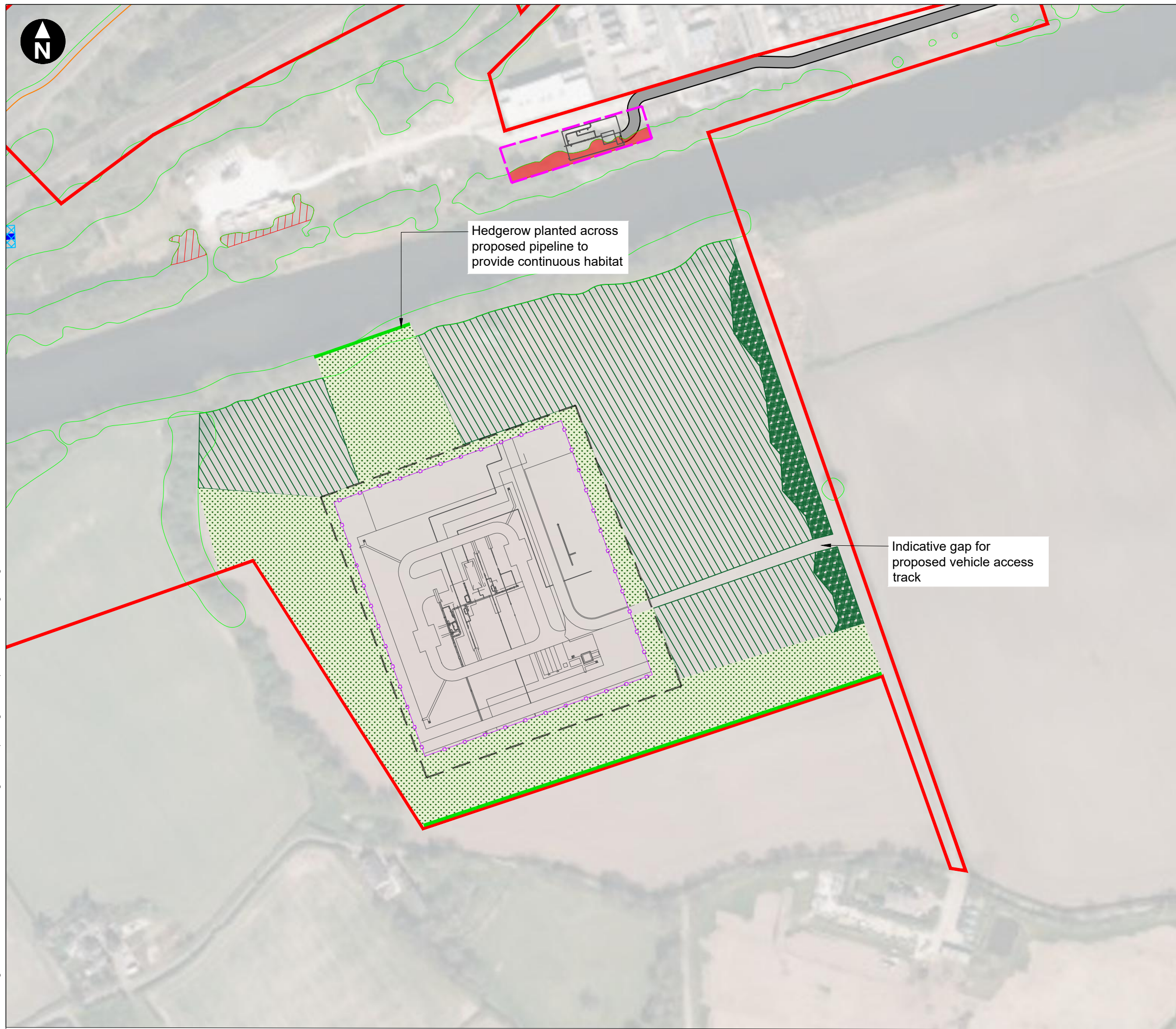
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Figure 5
Higher Walton (HWH2) HAGI Outline
Landscape Planting Proposals

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Key

- Draft Order Limits
- Limit of Deviation
- HAGI/BVI outer security fence
- Restricted Planting Zone
- Proposed access
- Indicative pipeline alignment
- Existing trees
- Root protection zone of existing trees
- Trees considered for removal
- Wildflower meadow
- Proposed woodland
- Proposed woodland scrub/edge
- Proposed hedge
- Existing hedge removed and replaced elsewhere within the Order Limits
- Existing Public Right of Way

This figure outlines the broad principles of the planting proposals but may be subject to minor changes at detailed design stage depending on the final footprint of the above ground infrastructure and pipeline alignment within the LoD. Planting within Pipeline Restricted Planting Zones shall adhere to "Planting and Management Wayleaves for underground pipelines" Presented at Appendix A'



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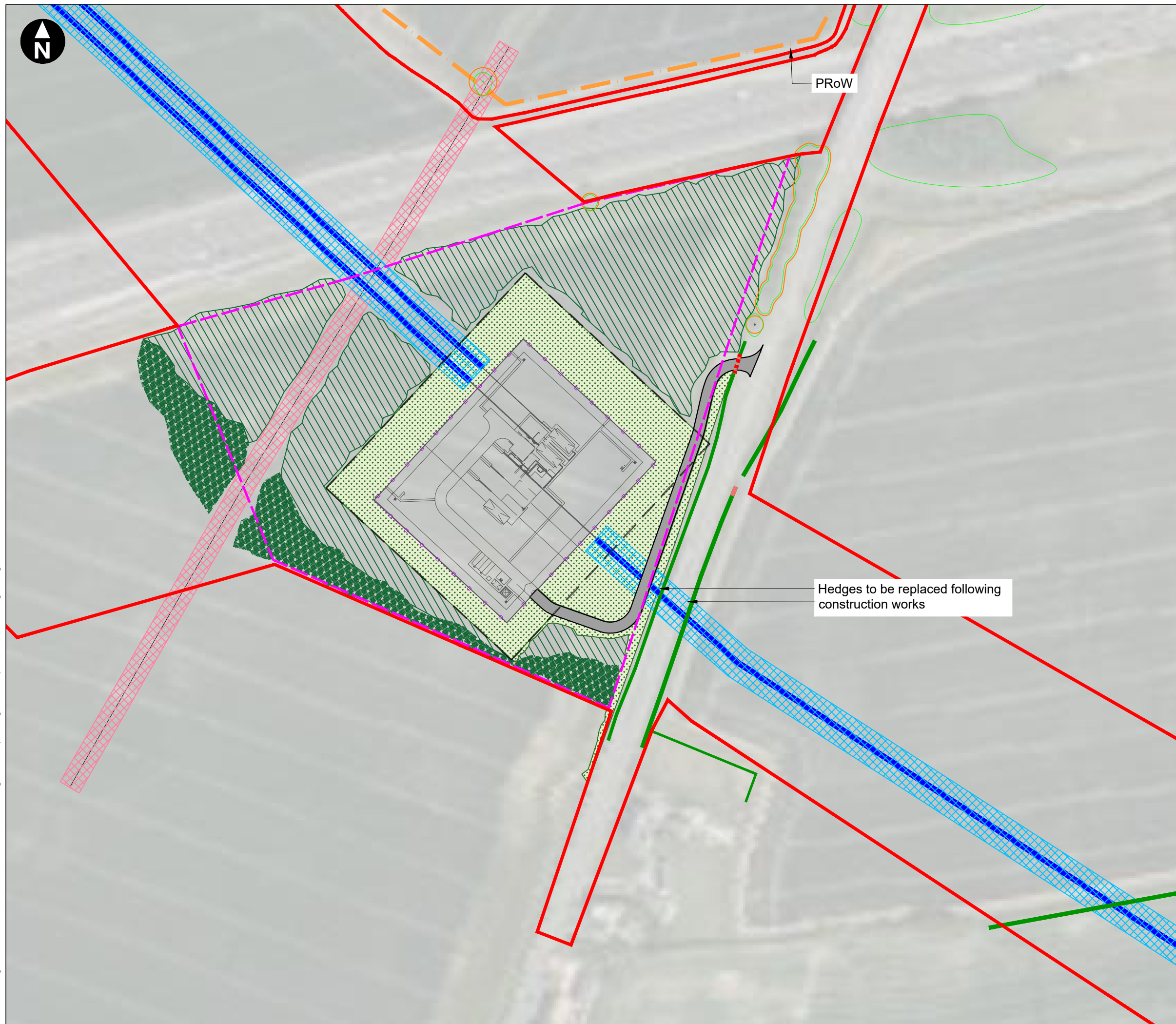
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Figure 6
Higher Walton (HWH8) HAGI Outline
Landscape Planting Proposals

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Key

- Draft Order Limits
- Limit of Deviation
- HAGI/BVI outer security fence
- Restricted Planting Zone
- Proposed access
- Indicative pipeline alignment
- Zone of limited planting
- Overhead power line (6m restricted planting zone)
- Existing trees
- Root protection zone of existing trees
- Wildflower meadow
- Proposed woodland
- Existing hedge
- Existing hedge removed and replaced elsewhere within the Order Limits
- Existing Public Right of Way

This figure outlines the broad principles of the planting proposals but may be subject to minor changes at detailed design stage depending on the final footprint of the above ground infrastructure and pipeline alignment within the LoD. Planting within Pipeline Restricted Planting Zones shall adhere to "Planting and Management Wayleaves for underground pipelines" Presented at Appendix A'



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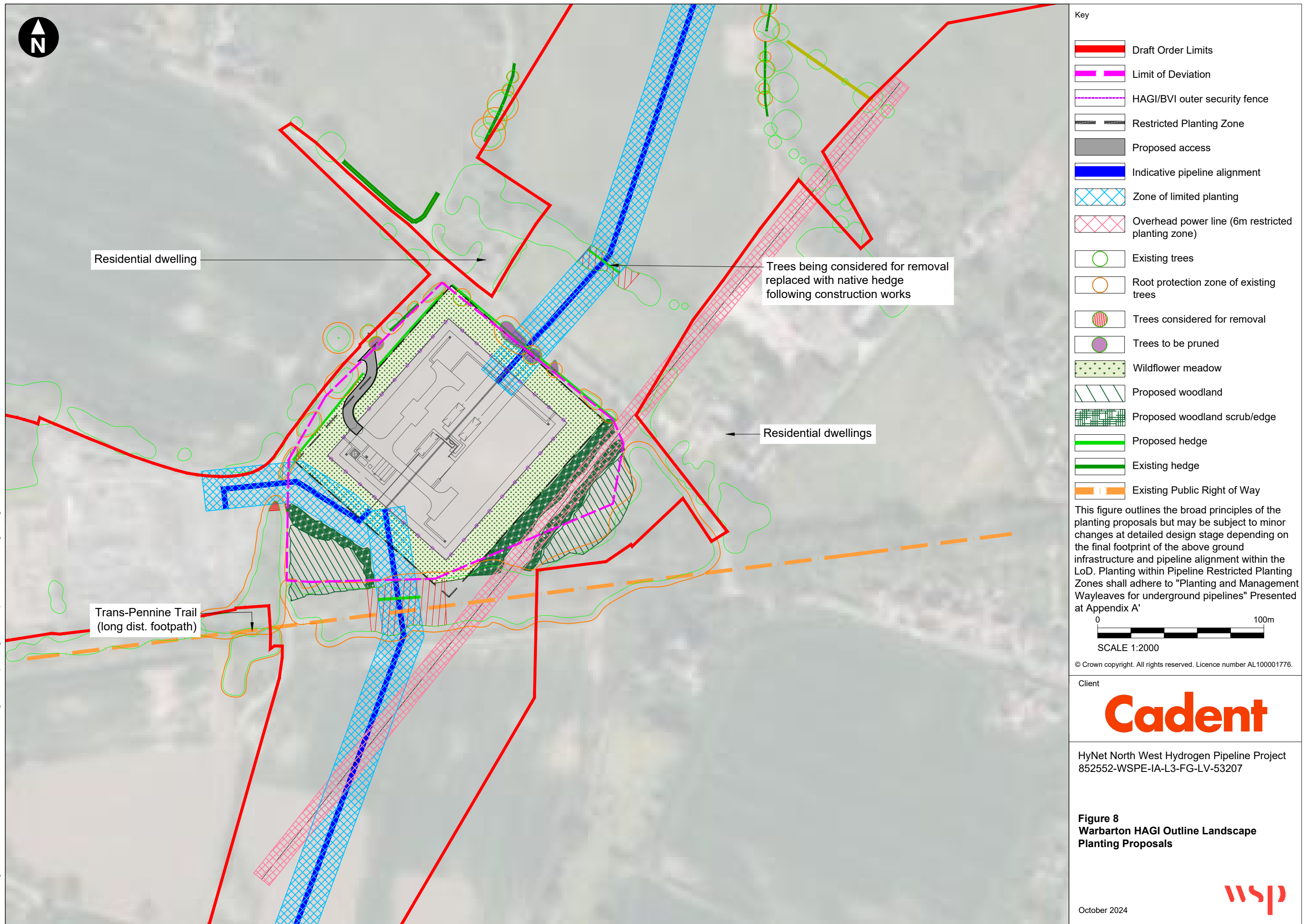
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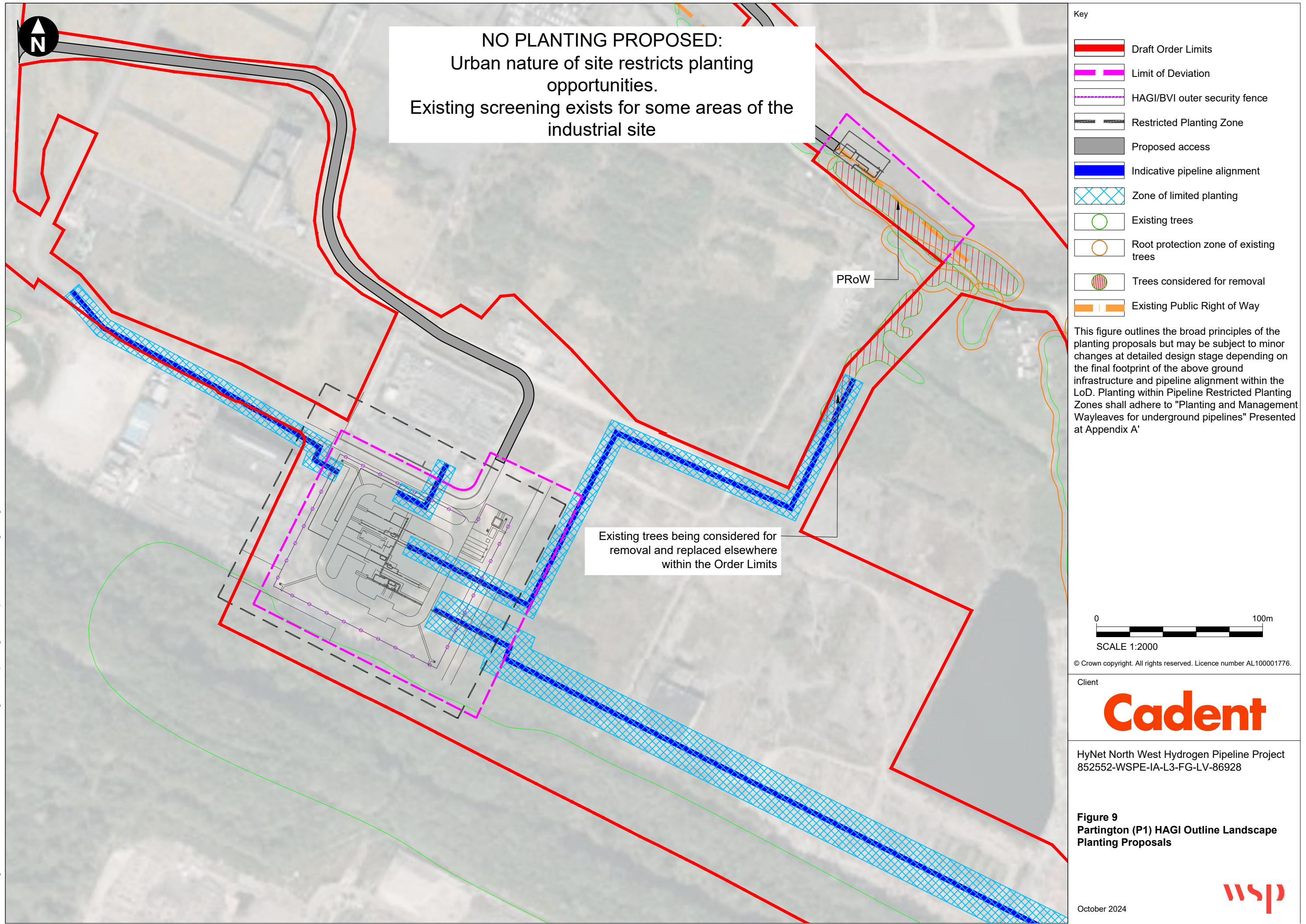
Figure 7
Clockface HAGI Outline Landscape
Planting Proposals

October 2024

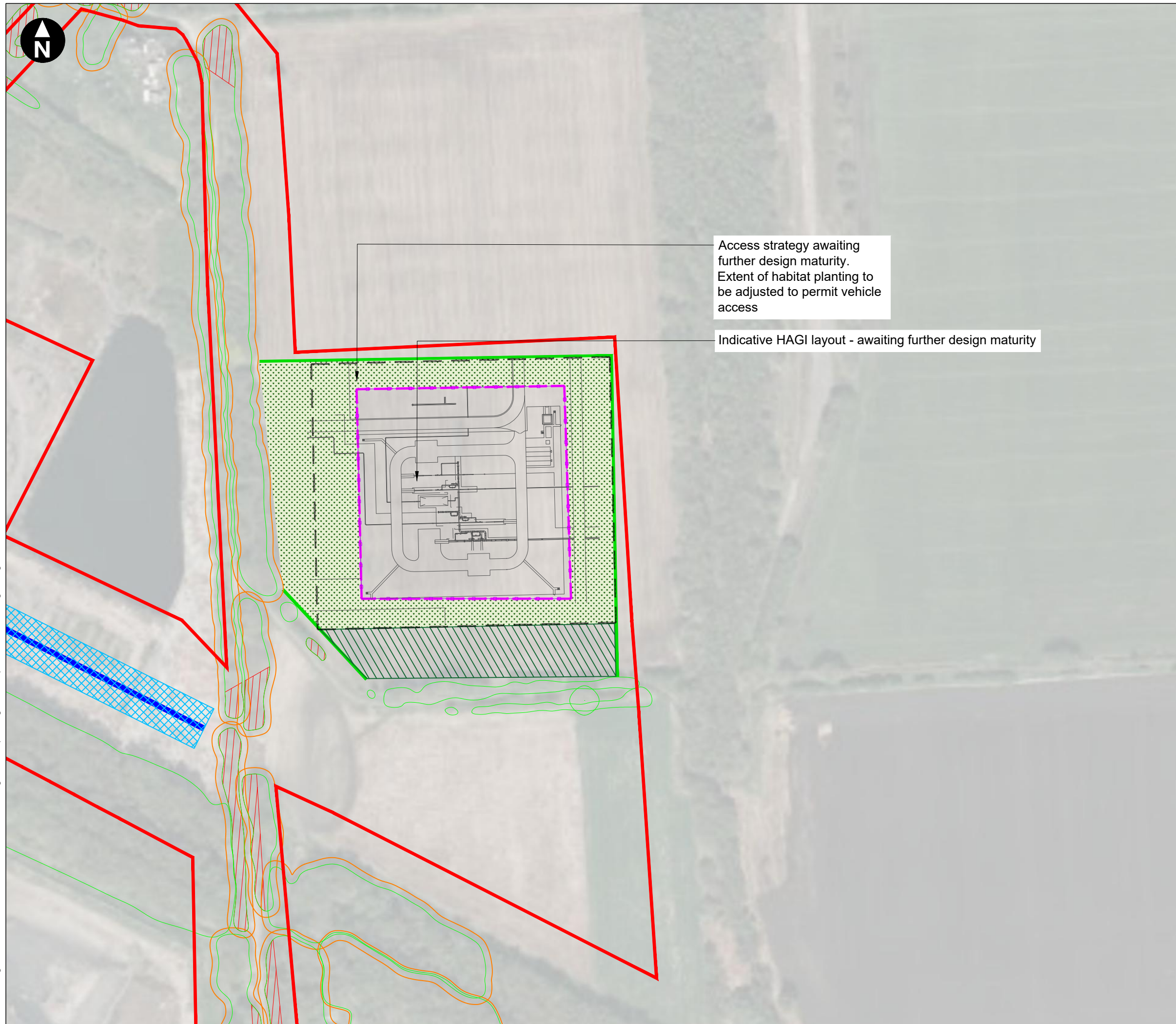
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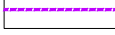
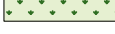
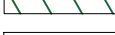




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Key

-  Draft Order Limits
-  Limit of Deviation
-  HAGI/BVI outer security fence
-  Restricted Planting Zone
-  Proposed access
-  Indicative pipeline alignment
-  Zone of limited planting
-  Existing trees
-  Root protection zone of existing trees
-  Trees considered for removal
-  Wildflower meadow
-  Proposed woodland
-  Proposed hedge

This figure outlines the broad principles of the planting proposals but may be subject to minor changes at detailed design stage depending on the final footprint of the above ground infrastructure and pipeline alignment within the LoD. Planting within Pipeline Restricted Planting Zones shall adhere to "Planting and Management Wayleaves for underground pipelines" Presented at Appendix A'



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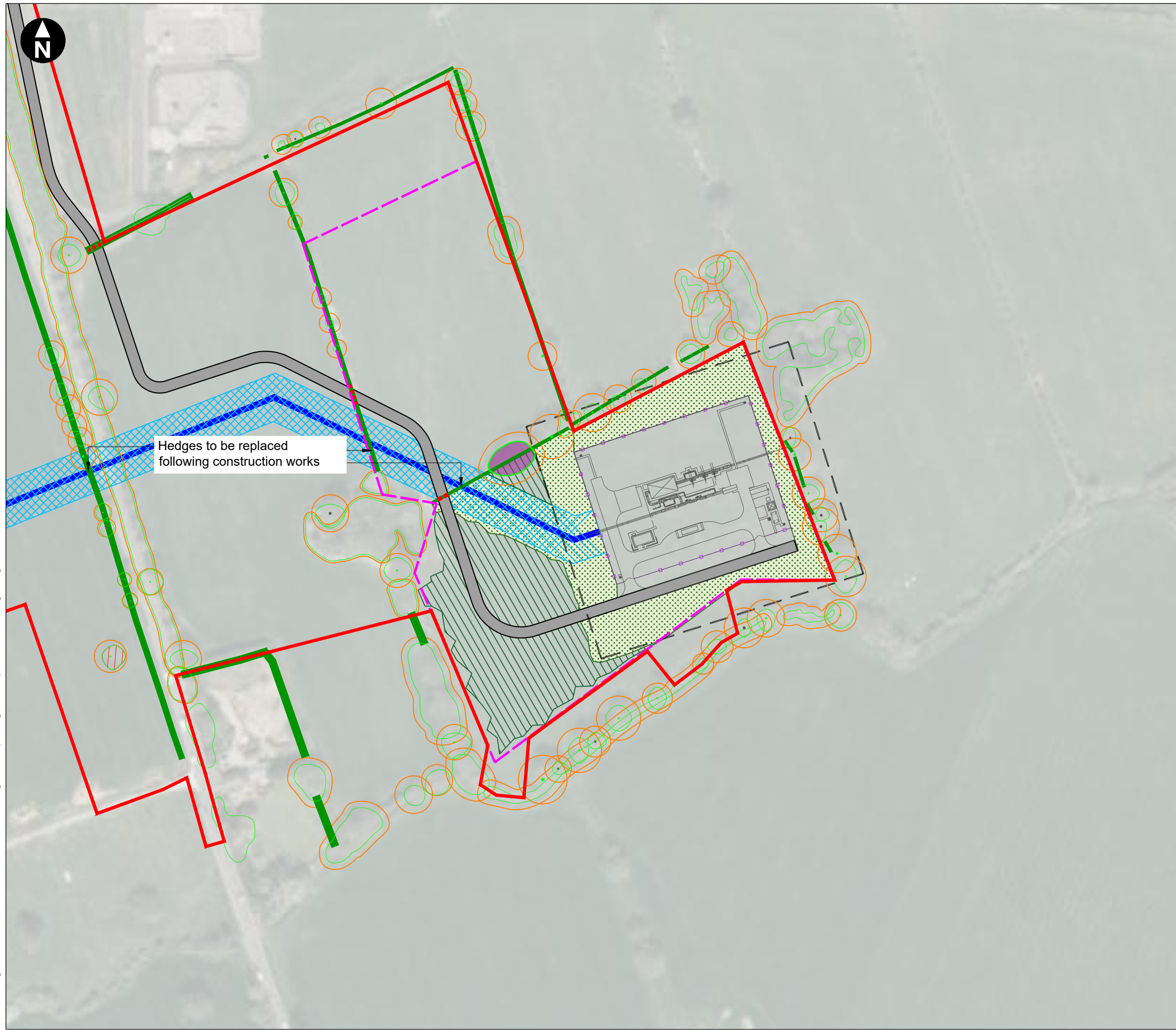
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Figure 10
Partington (P2) HAGI Outline Landscape
Planting Proposals

October 2024

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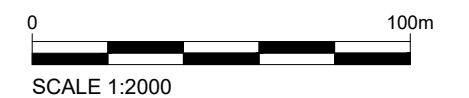
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Key

- Draft Order Limits
- Limit of Deviation
- HAGI/BVI outer security fence
- Restricted Planting Zone
- Proposed access
- Indicative pipeline alignment
- Zone of limited planting
- Existing trees
- Root protection zone of existing trees
- Trees considered for removal
- Trees to be pruned
- Wildflower meadow
- Proposed woodland
- Existing hedge
- Existing hedge removed and replaced elsewhere within the Order Limits

This figure outlines the broad principles of the planting proposals but may be subject to minor changes at detailed design stage depending on the final footprint of the above ground infrastructure and pipeline alignment within the LoD. Planting within Pipeline Restricted Planting Zones shall adhere to "Planting and Management Wayleaves for underground pipelines" Presented at Appendix A'



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Client

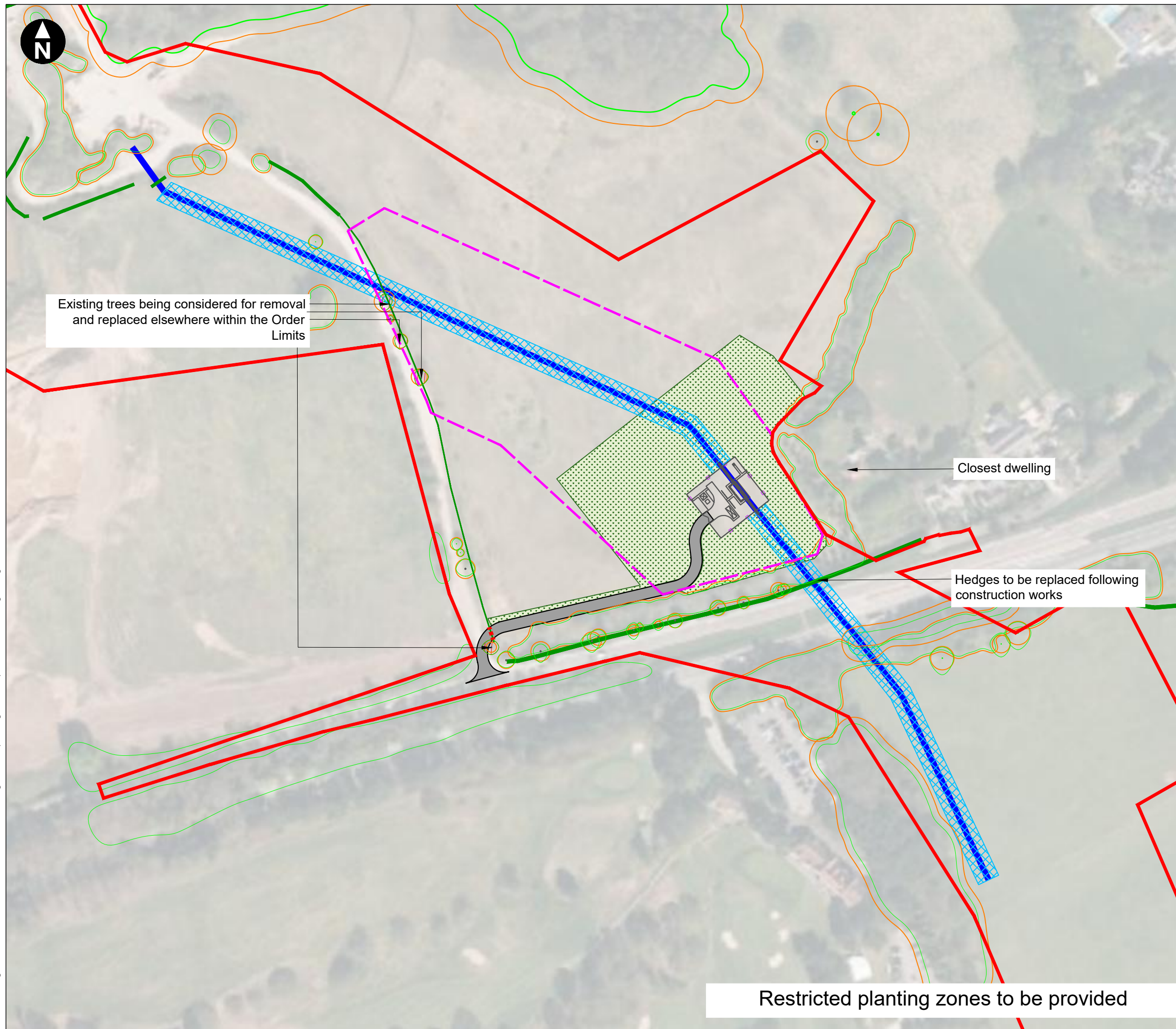
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852552-WSPE-IA-L3-FG-LV-1988

Figure 11
Hydrogen Storage Facility HAGI Outline
Landscape Planting Proposals

October 2024

wsp



Key

- Draft Order Limits
- HAGI/BVI outer security fence
- Limit of Deviation
- Proposed access
- Indicative pipeline alignment
- Zone of limited planting
- Existing trees
- Root protection zone of existing trees
- Trees considered for removal
- Wildflower meadow
- Proposed woodland
- Existing hedge
- Existing hedge removed and replaced elsewhere within the Order Limits

This figure outlines the broad principles of the planting proposals but may be subject to minor changes at detailed design stage depending on the final footprint of the above ground infrastructure and pipeline alignment within the LoD. Planting within Pipeline Restricted Planting Zones shall adhere to "Planting and Management Wayleaves for underground pipelines" Presented at Appendix A'



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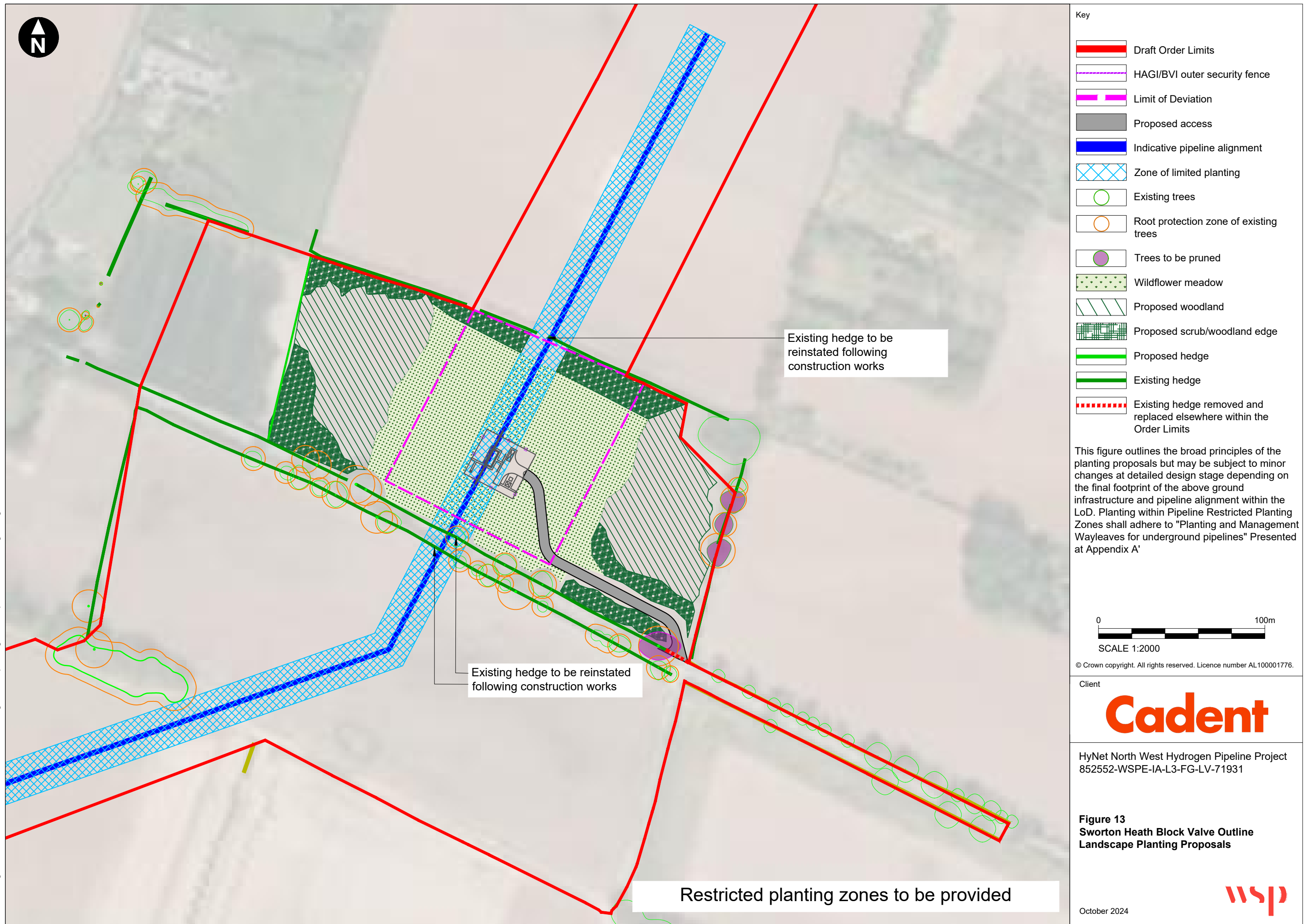
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Figure 12
Hartford Block Valve Outline Landscape
Planting Proposals

October 2024

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Appendix A

Planting and Management Guidance for underground pipelines

Introduction

Account has been taken of industry guidance on buffers required between vegetation and underground pipelines.

Retaining Vegetation

The minimum distance for retaining mature trees close to the underground pipeline is 6m, which is based on industry guidance comprising Cadent's *Tree planting restrictions near gas pipes*¹² and the National Joint Utilities Group's *Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees*¹³.

Reinstatement of Vegetation

The industry guidance advises that:

- only hedge plants (Blackthorn (*Prunus spinosa*), Hawthorn (*Crataegus monogyna*), etc.) may be planted over the pipeline where a hedge is necessary either for screening purposes or to indicate a field boundary.
- within 3-6m of the pipeline, only shallow rooted shrubs such as Blackthorn (*Prunus spinosa*), Hazel (*Corylus avellana*), Broom (*Cytisus scoparius*), Elder (*Sambucus nigra*), and Hawthorn (*Crataegus monogyna*) may be planted.
- beyond the 6m buffer, most native trees and shrubs can be allowed except for willows (*Salix sp.*) and poplars (*Populus sp.*) which are not to be planted within 10m of the outside edge of the pipeline, due to their invasive roots.

¹² Cadent Gas (undated), Tree planting restrictions near gas pipes - Guidance notes. (Online). Available at: <https://cadentgas.com/getmedia/25062e2f-7a72-4990-a818-0d6762af9d59/Tree-planting-guidance-Cadent-for-web.pdf>

¹³ National Joint Utilities Group (2007). Volume 4 NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.

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