VOLUME 4: APPENDIX V1-3.7: DISMANTLING PLAN

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1.1 Introduction

1.1.1 This appendix summarises the options available for dismantling the existing Strathy North 132 kV trident 'H' wood pole overhead line (OHL) following the construction and commissioning of the proposed Strathy South Wind Farm Grid Connection (hereafter referred to as 'the Proposed Development') and the measures that would be put in place to safeguard and protect the environment during dismantling operations. This document has been prepared by the Applicant and with input from environmental specialists, as required. It is intended to provide an outline of the dismantling options available and where such options would likely be utilised across the project. The document will form the basis from which a detailed dismantling plan can be drawn up by the Principal Contractor.

1.1.2 The existing OHL comprises the following components required to be dismantled: Dismantling of approximately 7.1 km of the existing Strathy North 132 kV trident 'H' wood pole OHL between Pole 48 and Pole 128 (see **Volume 2: Figure V1-3.2 – Proposed Dismantling Works**).

1.2 Dismantling Options

1.2.1 The following provides a summary of the advantages and disadvantages of the likely options available for dismantling the existing wood pole OHL.

Access

1.2.2 To dismantle the existing wood pole OHL, access to each pole location would be required. In the majority of cases, this would require access by tracked vehicles to each pole. The advantages and disadvantages of use of tracked vehicles is set out in **Table 1** below, and are set out in further detail in **Annex 1 –Table 1**.

Table 1: Advantages and Disadvantages of use of Tracked Vehicles

Access Method	Advantages	Disadvantages
Tracked Vehicles	• Least expensive option • Less weather dependent	• Potential for land / habitat damage in areas of wet / boggy ground • It may not be possible to track between poles due to terrain, necessitating extended travel time in some areas.

1.2.3 Existing access tracks would be utilised as far as practicable, including any new access tracks constructed to facilitate construction of the Proposed Development. It is not currently anticipated that any new access tracks would be required to facilitate dismantling.

1.2.4 It is not anticipated that helicopters or marine access would be used for dismantling operations on this project.

1.2.5 Access is required to allow operatives to reach the work location and to bring in equipment for the preparation of the conductor and earthwire removal such as lifting equipment and running out wheels. The number of operatives accessing each pole location will depend on the stage of the works (discussed further below).

Conductor and Earth Wire Removal

1.2.6 The methods considered for the removal of conductors and earth wires are set out in **Table 2**.

1.2.7 For the removal of conductors and earthwire associated with wood poles, preparation works are required. This includes transferring the conductors and earthwire to running out wheels using lifting equipment i.e. pull-lift, slings and shackles. To keep spans balanced adjacent to the section being recovered, back stays need to be installed. Back stays would normally consist of sledges, kentledge blocks, Tirfors and bonds (see **Annex 1, Table 3**, Option 5) placed at a set distance, typically 1.5-2 times the pole height away. Alternative options to sledges and blocks include soil and rock anchors. For installation of back stays it is anticipated that four to six operatives would be required. Conductor and earthwire transfer to running out wheels would require three to five operatives, depending on the pole type.

1.2.8 Reel winders (see **Annex 1, Table 2**, Option 3) are a standalone piece of equipment that not only reel in conductor and earthwire but collect on a drum attached to the machine. These drums are smaller than a typical conductor drum and are lighter. They are usually able to be unbolted to remove the conductor rather than having to rotate the drum to remove.

1.2.9 A Tesmec machine (see **Annex 1, Table 2**, Option 2) requires more equipment than a reel winder which includes hydraulic motors and hoses, drums and spindles and stands to mount drums. As these machines are able to recover many spans they require sledges and kentledge blocks to keep them in position.

Table 2: Conductor and Earth Wire Removal Options

Plant	Advantages	Disadvantages
Reel Winder	• Faster setup compared with tesmec • May be able to fly into position	• Not able to recover as many spans of a conductor as a Tesmec • String reel winder in multiple locations would be difficult where steep side slopes exist.
Tesmec	• Able to recover spans more quickly once set up	• Requires more equipment than the reel winder, inclusive of anchorage and drum stands etc.

It is anticipated that a reel winder would be utilised for the recovery of conductors at all wood pole locations.

Insulator and Fitting Removal

1.2.10 The methods considered for removal of insulators and fittings are set out in **Table 3**.

Table 3: Insulator and Fitting Removal Options

Access Method	Advantages	Disadvantages
Tracked Vehicles	• Least expensive option • Less weather dependent	• Level area required to deploy crane outriggers to lift materials • Potential for land / habitat damage in areas of wet / boggy ground • May be unable to track between towers due to steep-sided slopes

1.2.11 It is anticipated that at all wood pole locations, tracked vehicles would be utilised for removal of insulators and fittings. It is not anticipated that helicopter or marine craft would be utilised for insulator and fitting removal.

1.2.12 Once the conductor has been removed, the insulators, OHL fittings and running out wheels need to be lowered to ground level before a wood pole can be felled. This task is completed with the use of basic lifting equipment such as a rope, slings and shackles. Approximately three operatives would likely be required to complete this task.

Existing Structure Removal

1.2.13 The method considered for removal of existing wood poles are set out in **Table 4**.

Table 4: Existing Structure Removal Options

Removal Options	Advantages	Disadvantages
Tracked Vehicles	• Least expensive option • Less weather dependent	• Excavators and tracked dumper required • Potential for land / habitat damage in areas of wet / boggy ground • Low fire risk associated with cutting tower legs

1.2.14 It is anticipated that tracked vehicles would be utilised for the removal of all wood poles.

1.2.15 After all the conductors have been removed, erect a single member pole 5 m in front of the H pole with a back guy rope fitted to a Tirfor and ground anchor by a span set. A metal running block shall then be fitted to the top of the single pole using one 5,000 kg choked span set lashing sling.

1.2.16 Close to the top of the H pole, one span set lashing sling shall be fitted to each limb of the structure and a 4-tonne winch wire run through the block and connected to a shackle connecting the span sets. The two limbs and the back side of the H pole crossarm are then fitted with guy ropes and Tirfor winches connected to ground anchors, the latter set 1.5 times height of poles away from the structure.

1.2.17 The poles can then be excavated to a depth of one metre. The side of the excavation which will receive the lowered pole shall be sloped from a point 2 m away from the H poles down to the full planting depth of the structure. On the opposite side of the excavation, position skid boards behind each limb of the structure. The poles can then be lowered to the ground by attaching the 4-tonne winch wire to a tractor winch whilst the side Tirfor winches are slowly released as the structure is lowered. See **Figure 1** in **Annex 2.**

Foundations Removal

1.2.18 Wood pole foundations are made up of the poles themselves plus some additional steel and timber below ground level. The extraction method for these is to dig down, remove the poles and backfill.

1.3 Dismantling Plant

1.3.1 The various plant available for use in dismantling the existing wood pole OHL are illustrated in **Annex 1**. These include helicopters with differing lift capacities, ATVs, conductor recovery plant and various supporting mobile plant.

1.3.2 As noted above, it is anticipated that helicopter would not be used for dismantling work.

1.4 Duration of Works

1.4.1 Dismantling works across the project are anticipated to last approximately six months. Whilst there are a number of variables that determine how long each pole would take to dismantle, including terrain, access type and length, it is generally anticipated that a day per removal of a wood pole would be expected.

1.5 Environmental Management during Dismantling

1.5.1 All dismantling works would be carried out in accordance with industry best practice construction measures, guidance and legislation, together with the following documents and procedures:

GEMPs

1.5.2 General Environmental Management Plans (GEMPs) have been developed by the Applicant. The GEMPs considered relevant for this project are identified in **Volume 4: Appendix V1-3.4: SSEN GEMPs** of this EIA Report.

SPPs

1.5.3 Species Protection Plans (SPPs) have been developed by the Applicant and have been agreed with NatureScot. These can also be found in **Volume 4: Appendix V1-3.5: SSEN SPPs** of this EIA Report.

CEMP

1.5.4 A contractual management requirement of the Principal Contractor would be the development and implementation of a Construction Environmental Management Plan (CEMP). This document would detail how the successful Principal Contractor would manage the site in accordance with all commitments and mitigation detailed in the EIA Report, statutory consents and authorisations, and industry best practise and guidance. An Outline CEMP is included in **Volume 4: Appendix V1-3.8: Outline CEMP** of this EIA Report. **Volume 1: Chapter 13 - Schedule of Mitigation** provides a summary of all mitigation measures included in this EIA Report.

1.5.5 The CEMP would also reference the aforementioned GEMPs and SPPs. The implementation of the CEMP would be managed on site by a suitably qualified and experienced Environmental Clerk of Works (EnvCoW), with support from other environmental professionals as required.

Potential Environmental Constraints

1.5.6 **Table 5** provides a summary of potential environmental constraints associated with dismantling operations. Further assessment of dismantling works is included within relevant technical chapters of the EIA Report.

Table 5: Potential Environmental Constraints

Activity	Potential Impact	Mitigation
Access by tracked vehicle	• Potential for damage to sensitive habitats, for example peatland habitats; • Potential for disturbance to birds and protected species; • Potential for pollution, erosion and sedimentation of the water, geology and soils environment; and • Potential for damage to archaeological remains.	• Adherence to industry best practice and guidance, as well as the project specific CEMP, GEMPs and SPPs; • Pre-construction surveys to establish presence of protected species; and • Monitoring by Environmental Clerk of Works (EnvCoW), Ecological Clerk of Works (ECoW) and Archaeological Clerk of Works (ACoW) where required.
Foundation Removal	• Potential for damage to adjacent sensitive habitats; • Potential for disturbance to birds and protected species; • Potential for pollution, erosion and sedimentation of the water, geology and soils environment; and • Potential for damage to archaeological remains.	• Adherence to industry best practice and guidance, as well as the project specific CEMP, GEMPs and SPPs; • Pre-construction surveys to establish presence of protected species; and • Monitoring by ECoW and ACoW where required.

ANNEX 1 – PLANT AND EQUIPMENT OPTIONS FOR DISMANTLING

Table 1 – All-Terrain and Tracked Vehicles

Image	Details
	**Option 1 - Hagglund** Designed for load and passenger carrying. Ground pressure of 8psi. Front cab can accommodate up to five occupants with seating totalling 15 with people carrying body. Trailer load capacity up 2,500 kg, with integrated hi-ab can replace rear cab section of the machine.
	**Option 2 - Argocat** Argocats come in various configurations. These machines can be fitted with winches, canopies and tracks. Tracks create half the ground pressure of the wheeled version. Load carrying capacity of approximately 450 kg. Six seats including driver.
	**Option 3 - Soft Track** Very low ground pressure, lightweight and high ground clearance. Various configurations available. Wheel and tracked trailers with integrated Hiab can be towed. Hydraulic power take-off (PTO) allows machine to be fitted with a capstan.
	**Option 4 - Mule** Two-seater machine with carrying capacity up to approximately 450 kg. More suited to level, less undulating terrain.
	**Option 5 - Polaris** These machines come in a variety of specifications. The Ranger Crew (shown) has six seats with a rear box able to carry approximately 450 kg. Designed for off-road, these types of machines would be suited to more level ground conditions. Similar style machines can also be fitted with tracks.

Image	Details
	**Option 6 - Low Ground Bearing Tracked Excavator** Low ground bearing tracked excavators are available in many sizes. The benefit of these compared to standard tracks is they are less likely to create ruts and cut up the ground. Increased traction and stability could provide more access to remote areas.
	**Option 7 - Low Ground Bearing Tracked Dumper** Reduced ground pressure would likely result in fewer ruts and less land damage. Increase traction and stability could provide more access to remote areas. These would be used deliver equipment required for conductor recovery and removal of redundant tower steel, fittings and insulators.
	**Option 8 - Tracked Crane** The use of tracked cranes would primarily be in the dismantling of decommissioned trident wood poles.
	**Option 9 - Tracked Mobile Elevated Working Platform** Used for work at height during removal of wood poles.
	**Option 10 – Excavator Mounted Winch** Used for felling of steel towers and removing steelwork.

Table 2 – Dismantling and Conductor Recovery

Image	Details
	**Option 1 - Crane** Used for the removal of towers at substation locations / where felling is not possible.
	**Option 2 - Puller / Tensioner (Tesmec)** Used in the recovery of conductors.
	**Option 3 - Reel Winder** Used in the recovery of conductors.

Table 3 – Other Mobile Plans

Image	Details
	**Option 1 - 4x4 Hiab Lorry** 4x4 lorries are used to deliver / collect plant and materials to locations off main highways where standard rigid body trucks and low loaders have trouble accessing due to rough tracks and steep climbs. Mounted cranes are available in different load lifting abilities and reach.
	**Option 2 - Roll-on Roll-off Skip Lorries** Sections of steel would be taken from the tower locations to the nearest track and loaded into skips to be taken to a recycling facility. These type of roll-on off skips are also used to remove conductors, OHL fittings and insulators.
	**Option 3 - Telehandler with Drum Carrying Attachment** Used to replace conductor drums.
	**Option 4 - Towable Fuel Bowsers** Available in different capacities. Potable & towable with 4x4. Fuel pump can be electric and manual.
	**Option 5 – Backstay Equipment** Sledges, kentledge blocks, Trifors and bonds.