Lea Castle Farm - Regulation 25 Submission **APPENDIX G**

Planting, Sowing, Establishment and Outline Aftercare Strategy in respect of Application ref: 19/000053/CM

This Appendix contains Outline Aftercare Strategy information for the establishment and management of advanced planting and restored land, associated with the Lea Castle Farm Minerals and Restoration Scheme – Application ref: 19/000053/CM

The Outline Aftercare Strategy being discussed and agreed with the proposed Site Operator and the Landowner.

The Concept Restoration Scheme being illustrated on Planning Application Drawing No.15**A**, which contains the following principle restored land uses.

i. ***Woodland***
ii. ***Agricultural Land***
iii. ***Hedgerows***
iv. ***Species Rich Acidic Grassland***
v. ***Avenue Trees***
vi. ***Parkland Trees***

Aftercare Programme and Site Records

An annual Site meeting between NRS, the Mineral Planning Authority, DEFRA, and the Landowner, will be held in October of each year of the aftercare period, or on a time to be agreed. The performance of the previous year's aftercare will be reviewed and the detailed programme will be agreed for the following year. Detailed Site record of the aftercare programme will be kept and made available to the Mineral Planning Authority two months in advance of the annual aftercare Site meeting.

NRS will be responsible for implementing the restoration scheme and a representative will be available to discuss details at aftercare Site meetings.

To prevent soil erosion and damage to the soil structure, vegetation will be established as soon as possible after soils have been replaced and will not be left as bare earth over winter. During restoration, soils will be handled in accordance with the methods outlined in Sheets 3, 4 and 15 of the 'Good Practice Guide for Soils' produced by the Ministry of Agriculture, Fisheries and Food (MAFF).

Soil samples will be taken and analysed following the placement of soils and subsequently at the end of years 3 and 5, to determine pH, phosphorous, potassium and magnesium. The findings of these tests will be applied to the varying restoration land uses, to guide any application of fertilisers and or soil ameliorants.

If further detailed establishment and Aftercare Strategy information is required, or changes to proposed detailed species mixes, these are to be subject to the discharge of a planting and aftercare condition.

Concept Restoration (Planning Application Drawing No. 15A)

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Detailed Planting Proposals : Woodland : Total Number of Trees to be Planted on Site = 9,750

A number of blocks of woodland form structural landscape features within the Restoration Strategy. These features replicate local landscape features and once reinstated will integrate and assimilate the long term restored / managed landscape and land uses into the local setting. Woodland will be managed to promote species diversity of both flora and fauna.

Native tree and shrub species have been selected based upon locally observed species composition and native spcies diversity, associated with local ground conditions and soil types. Oak has not been included within this mix as restored agricultural land may be used on a rotational basis to stock horses (Oak tree leaves and acorns can be toxic to horses).

Proposed Species Composition:

Planting Specification -Woodland Blocks					W1
Species	**Common Name**	**% Mix**	**Height (cm)**	**Bareroot (BR)**	**2,832 m2**
Trees					
Carpinus betulus	Hornbeam	10	20-30	BR	70
Fagus sylvatica	Beech	10	45-60	BR	70
Acer camprestre	Field Maple	5	20-30	BR	35
Shrubs					
Corylus avellana	Hazel	15	45-60	BR	105
Crateagus monogyna	Hawthorn	15	20-30	BR	105
Viburnum opulus	Guelder Rose	10	45-60	BR	70
Malus sylvestris	Crab Apple	10	45-60	BR	70
Cornus sanguinea	Dog Wood	5	45-60	BR	35
Nurse Species					
Betula pendula	Birch	10	30-45	BR	70
Sorbus aucuparia	Mountain Ash Rowan	10	45-60	BR	70
		100			**700**

Preparation / Establishment:

- Planting will be directly into the restored and cultivated soil profile.
- All trees & shrubs to be of local provenance.
- All trees and shrubs to be planted at 2m centres in 300x300x300mm pits backfilled with original ground material and/or notch planted.
- Stock to be planted in species pure groups of 3, 5 and 9 plants.
- Stock to be protected by 1 No 75cm Tubex tree guard (or equivalent) secured and supported by a 900x32x32mm treated softwood stake or 900mm canes.
- All tree / shrub planting blocks are to be protected by stock proof fencing where required due to adjacent land management (see Figure 2 for specification).
- 1 No individual stile is to be fixed within the fencing to allow access for ongoing management and maintenance.
- Planting to be undertaken between November and March.
- Trees should be watered during any dry spells in the first growing season.

Management:

- During years 1 to 3, three maintenance visits will be made per annum (March, May and September).
- During years 4 and 5, two maintenance visits will be made per annum (May and September).
- Weeding in 1m diameter around the bases of the trees will be required to help combat competing vegetation with Years 1 to 5.
- Following the 1st growing season, each winter a failed 'beating up' inspection will take place to ensure an 85% overall stocking density by years 3 and 5. This will include the replacement of dead/diseased or dying plant stock (within the following planting season), replacement/ straightening of tree guards and stakes, and removal of herbaceous vegetation from tree guards as necessary to ensure successful establishment.
- The tree guards and canes should be inspected within Years 1 to 5 to ensure their integrity. Once the trees have matured the tree guards must be removed (by Year 5)
- Formative pruning should take place throughout the 5 years to counter poor structure and development. This should take place in years 3 and 5.
- Tree thinning (25%) should also be undertaken where necessary. It is anticipated that this will be required in Year 5, however growth should be monitored throughout the aftercare period.

Outline 5 Year Aftercare:

Management Activity	Y1	Y2	Y3	Y4	Y5
Pruning to counter poor structure and development (where necessary)			■		■
Maintenance of tree / shrub guards	■	■	■	■	■
Clearance of herbaceous material from tree guards	■	■	■	■	■
Failed plant 'Beat Up' to 85% stocking to next season			■		■
Tree guards removed (if established)					■
Thinning by 25% if required					

■ *Action Within this Period*

□ *No Action Required*

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Detailed Seeding Proposals : Agricultural Habitat

Areas of the land within the planning application boundary will be restored to productive agricultural land. This restoration will see the establishment and management of a suitable high quality land use and the potential for seasonal long term crop rotation. This is a key aim of the Restoration Strategy in reinstating the site to productive use, enhancing local landscape character and ensuring its contribution to surrounding land uses. Where land is to be restored to agriculture, this will be managed in continuity with the landowner and/or the tenant farmer and as such, this document has been prepared to be reactive to the flexibility required for agricultural practices within the Site.

Two options have been provided which allow either an agricultural grassland or cereal crop rotation to be successfully established, or a combination of the two. The exact composition of this would be established in consultation with the landowner and tenant farmer and reviewed as part of the annual aftercare meeting.

Proposed Species Composition:

Proposed Initial Agricultural Seed Mix *Based upon Wynnstay Short Term Stitching in Mix - Plus Clover (or similar)*	
Species	**%**
AberEcho Hybrid Tetraploid Ryegrass	25
Malone Intermediate Tetraploid Perennial Ryegrass	25
Tetragraze Hybrid Tetraploid Ryegrass	25
Barblanca Large leaf White Clover	6.25
Crusader Medium leaf White Clover	12.5
Rivendell Small leaf White Clover	6.25
To be sown evenly at a rate of 2.5g/m2 by a seed distributor	**100**

Preparation / Sowing:

Establishment / General Notes:

- A short term agricultural ley (Wynnstay Short Term Stitching In Mix- Plus Cover or similar) will be created in the first two years after restoration and thereafter the land will either be used as pasture or arable land depending on the landowner / manager's requirements
- Land is to be cultivated using discs, power harrow and rolls to create a fine, firm seedbed, it will then be seeded and rolled. Any stones lying on the surface, which would not pass through a 100mm wire screen mesh, together with other objects likely to obstruct future cultivation, will be removed from the site.
- Given the permeability of the gravelly soil profile and in-situ material it is not considered that underdrainage installation will be required. After restoration and monitoring of ground conditions for at least two years as well as consultation with the landowner / manager, if it is considered that under-drainage is required a commitment in principal is given to undertake appropriate land drainage.
- If required, drainage will be installed via a conventional trenchless drainage machine placing a perforated corrugated plastic drain pipe at 20m spacing, with a placement depth of at least 80cm.
- Following the laying of drains (if required), subsoiling at a shallow depth (~ 35cm) would be carried out to ensure a good connection between the bulk of the upper subsoil and the drains.
- Soil sampling and crop monitoring is to take place to ensure soil fertility is satisfactory to achieve and maintain the long term site restoration after uses. As a result of this, appropriate applications of fertiliser and/or weed control treatment will be implemented, if necessary.
- If necessary fertiliser and lime shall be applied to the restored land at a rate calculated to achieve the nutrient levels to successfully establish a short-term grass ley or cereal crop.
- Initial grass seeding work will take place between April and May or late August to mid-September dependent upon the date when restored land becomes available.
- If a cereal crop is selected it will be drilled in either spring or autumn and the type will depend upon the landowners / managers cropping requirements / rotation.
- Occasional periodic dressings with farmyard manure and lime, where determined beneficial, will be completed during the aftercare period.
- Conservation headlands will be ploughed and sown at the same time as the main field with a conservation field margin seed mix (Wynnstay Field Margin Grass Seed Mix or similar).
- Field margins to agricultural land will be lightly grazed or cut once every 3 years (outside the bird nesting season) and kept free of pesticides and fertiliser.

Management:

Year 1 (short-term grass ley)

- The sward is to be allowed to establish
- Soil samples are to be taken and analysed in March
- Fertiliser / lime (based on soil sample results)- to be applied in April
- If required, re-seeding works are to take place April
- Monitoring of soil drainage will be reported at the first year aftercare meeting.
- All restored land to be treated with an approved chemical herbicide to prevent weed establishment.
- One cut of hay or silage will be taken in early June and a second cut will be taken in July / August if there is sufficient growth.
- In the first year, the aftermath will be topped to 100mm before entering the winter period and any arisings which would smother the grass will be collected and carted off site.

Management (continued):

Year 2 (grassland)
- A grass crop for silage / hay is there is sufficient growth.
- Nitrogen fertiliser will be applied for a second grass cut.
- Soil samples are to be taken and analysed in March and based on the results, fertiliser/lime to be applied in April.
- Monitoring of soil drainage will continue.
- All restored land is to be treated with an approved chemical herbicide to prevent weed establishment, if necessary.
- Should it be required, an under drainage scheme will be designed and submitted to the MPA for approval.

Year 3 (grassland option)
- A grass crop for silage/hay is to be taken if there is sufficient growth.
- Soil samples are to be taken and analysed in March and based on the results, fertiliser/lime is to be applied in April, if necessary.
- Cultivation of topsoil will take place comprising discing and chain harrowing as required. Also upon completion of each stage of the cultivation process, stones that will not pass through a 100mm square wire mesh screen are to be removed.
- Given appropriate ground and nutrient conditions, re-seeding works may take the place of a more permanent grass ley.
- Monitoring of soil drainage and remedial works are to take place if required.
- All restored land is to be treated with an approved chemical herbicide to prevent weed establishment, if necessary.

OR

Year 3 (cereal option)
- Undertake soil analysis for P, K, Mg and pH to assess lime and fertiliser requirements for the chosen winter cereal crop.
- After seedbed preparation, drill cereal, e.g. Winter Barley, at approximately 175kg/ha and roll to get good seed-soil contact.
- Apply seedbed fertiliser and insecticides and herbicides, as required, in a tank mix to minimise the number of passes.
- In the spring apply nitrogen top dressing and herbicides and fungicides as required.
- July/August harvest.
- Glyphosate for stubble hygiene.
- Cereal variety to be agreed at the aftercare meeting.

Year 4 (grassland option)
- A hay/silage crop is to be taken in autumn.
- Soil analysis to take place in March followed by the implementation of fertiliser application and liming in April- dependent upon hay/grazing use.
- All restored land to be treated with an approved chemical herbicide to prevent weed establishment, if necessary.
- Monitoring of soil drainage and remedial works are to take place if required.

OR

Year 4 (cereal option)
As year 3. Cereal variety to be agreed at the aftercare meeting.

Years 5-15 (grassland option)
As year 4.

OR

Years 5-15 (cereal option)
As year 3 & 4.

Please note: a detailed crop rotation programme will be roduced by the landowner based upon restored soil conditions and food type / land use demand.

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Detailed Planting Proposals : Hedgerow Planting : Total Length to be Planted on Site = 1,018 linear m

Native hedgerow species have been selected based upon locally observed species composition and a wish to establish species in accordance with the Hedgerow Regulations 1997, supported by local ground conditions and soil type. Again, oak has not been included within this mix as restored agricultural land may be used on a rotational basis to stock horses (Oak tree leaves and acorns can be toxic to horses).

Proposed Species Composition:

Planting Specification- Hedgerow Planting				
Species	**Common Name**	**%**	**Height (cm)**	**Bareroot (BR)**
Crataegus monogyna	Hawthorn	50	35-40	BR
Corylus avellana	Hazel	10	35-40	BR
Acer campestre	Field Maple	10	35-40	BR
Frangula alnus	Alder Buckthorn	10	35-40	BR
Rosa arvensis	Field Rose	5	35-40	BR
Rosa canina	Dog-Rose	5	35-40	BR
Hedgerow Trees				
Acer campestre	Field Maple	4	180-250	BR
Tilia cordata	Lime	4	180-250	BR
Carpinus betulus	Hornbeam	2	180-250	BR
		100		

Preparation / Establishment:

- Generally, all planting will be undertaken in a double-staggered row (set 0.5m apart) with plants distributed 300mm apart along each row (6 plants per linear metre)
- Stock of 30-45cm 1+1 transplants will be used, except for Oak and Hornbeam hedgerow trees, where 180-250cm high stock will be used
- Planting will take place between the end of November and the end of March
- All plants will be protected from stock and rabbit grazing, either by individual guards of by protective fencing, depending upon the length and location of the hedge to be protected. All plants will be planted using notch-planting techniques.

Management:

- Following the 1st growing season, each winter, a failed 'beating up' inspection will take place to ensure a 85% overall stocking density by years 3, 5 and 10. This will include replacement of dead / diseased or dying plant stock, replacement / straightening of tree guards and stakes, removal of herbaceous vegetation from tree guard as necessary to ensure susccessful establishment.
- To control weeds and allow propoer growth and prevent unwanted succssion by invasive species, each spring, one application of an approved glyphosate will be applied to margins and / or additional spot spraying of any unwanted vegetation. If necessary and depending on the severity or amount of vegetation, encroaching vegetation will be strimmed or hand weeded (March, May and September)
- During years 1 to 3, three maintenance visits will be made per annum (March, May and September)
- During years 4 and 5, two maintenance visits will be made per annum (May and September)
- During May and September visits, any dead, dying or diseased species are to be taken out and removed off site and replaced during the following planting season (December to April) to ensure an 85% overall stock density by year 5
- In year 5 (if plants have grown to a suitable level) then the hedgerows will be laid to encourage longevity and maintain density
- All protective tree / shrub guards to be removed during the winter of year 5 unless agreed otherwise
- Existing hedgerows and new hedges are to be cut yearly, establish bulk and shape between begining of September and the end of February, but preferably in winter after most of the potential berries have gone.
- Existing hedgerows to be cut on a 2/3 year rotation outside of nesting bird season.

Note: On average hedgerow trees will be planted 1No pro-rata every 10m of hedge, in groups of 1, 3 and 5's.

5 Year Aftercare:

Management Activity	Y1	Y2	Y3	Y4	Y5
Light Pruning			■	■	■
Maintenance of tree / shrub guards	■	■	■	■	■
Clearance of herbaceous material from tree guards	■	■	■	■	■
Failed plant 'Beat Up' to 85% stocking rate			■		■
Encroaching vegetation strimmed / removed (July)	■	■	■	■	■
Tree guards removed (if established)					■
Hedge laying if there is sufficient growth					■
Infill planting if necessary (Year 1 to existing hedges)	■		■		■
Hedge cutting (existing)	■		■		■
Hedge cutting (new)		■	■		■

■ *Action Within this Period*

□ *No Action Required*

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Detailed Seeding Proposals : Species Rich Acidic Grassland Habitat : Total Area to be Planted on Site = 7.5Ha

Acidic Grassland is priority habitat within both Worcestershire and Nationally.

Successful establishment of this land use will provide additional priority grassland habitat within the county bringing opportunities for numerous faunal species presence.

Proposed Species Composition *to be agreed as part of Conditional Discharge:*

Acid Grassland Seed Mix		
Species	**Common Name**	**%**
Wildflowers		**20**
Achillea millefolium	Yarrow	0.5
Centaurea nigra	Common Knapweed	3
Daucus carota	Wild Carrot	1.5
Echium vulgare	Viper's Bugloss	2
Galium verum	Lady's Bedstraw	2.5
Leucanthemum vulgare	Oxeye Daisy	0.5
Linaria vulgaris	Common Toadflax	0.2
Lotus corniculatus	Birdsfoot Trefoil	0.5
Malva moschata	Musk Mallow	1
Plantago media	Hoary Plantain	0.5
Primula veris	Cowslip	1
Prunella vulgaris	Selfheal	1.5
Ranunculus acris	Meadow Buttercup	1
Ranunculus bulbosus	Bulbous Buttercup	2
Rumex acetosa	Common Sorrel	1.5
Rumex acetosella	Sheep's Sorrel	0.5
Scorzonerioides autumnalis	Autumn Hawkbit	0.2
Trifolium pratense	Wild Red Clover	0.1
Grasses		**80**
Agrostis capillaris	Browntop Bent	10
Agrostis vinealis	Brown Bent (w)	4
Anthoxanthym odoratum	Sweet Vernal grass	4
Cynosurus cristatus	Crested Dogstail	16
Deschampsia flexuosa	Wavy Hair-grass	2
Festuca ovina	Sheep's Fescue	20
Festuca rubra	Slender creeping Red fescue	16
Koeleria macrantha	Crested Hair-grass	3
Phleum bertolonii	Smaller Cat's tail	5
Total	**Sowing Rate: 4g/m2**	**100**

Preparation / Sowing:

Good preparation is essential to success, aiming to control weeds and produce a good quality seed bed before sowing. Sandy soils are usually infertile, well drained and easy to work. To prepare a seed bed, first weeds are to be removed using repeated cultivation and /or a herbicide. Then ploughing or digging to bury the surface vegetation, followed by harrowing to produce a medium tilth, and roll, or tread, to produce a firm surface.

Seed is to be sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture. The seed must be surface sown and can be applied by machine or broadcast by hand. The seed should not be incorporated or covered, but firmed in with a roll, or by treading, to give good soil/seed contact.

- Topsoils to be placed to a depth of 330mm
- Subsoils to be placed to a depth of 370mm
- Spray 3 weeks after soil replacement to ensure killing off of any latent weeds within the upper soil profile. Remove any weeds using repeated cultivation.
- Prior to seeding, the soil layer is to be disced and power harrowed to a depth of 200mm to create a homogenous well-broken, non-compacted tilth of 50mm.
- Stones and deleterious material exceeding 100mm in diameter to be removed before cultivation.
- Seeds to be sown according to manufacturers instructions at a rate of ~4g/m^2.
- Seeds to be British and preferably of local provenance.
- All cultivations will only be undertaken during dry ground and weather conditions.
- Translocated brash material to be spread over proposed 20-30% to promote areas of heathland.

Note: Works are to be carried out with Worcestershire County Council advice

Management:

It is confirmed that on the establishment of planting and seeding that all land and land use vegetation will be maintained by the operator and/or their tenants for a minimum of 5 years following the completion of restoration of the final phase. These works will take place once the planning permission is implemented on site. The initial aftercare of land commencing upon completion of restoration within Phase 1.

- A grassland cutting regime based on a cut to 50-75mm height following seed head production.
- Heathland areas to be left uncut within the first year and spot treated to remove invasive weeds to promote species estblishment.
- Re-seeding of failed areas where necessary.
- One visit per annum unti final restoration of the quarry has been completed, when the 5 year aftercare scheme will commence.
- Visits to include encouraging the development of the scrapes / marginal areas.
- Removal of noxious weeds may also be necessary.
- On final restoration, grassland will be selectively grazed within areas to encourage the development of poached micro-habitat within areas of damp ground that would lead to the development of tussocky grassland.

5 Year Aftercare:

Management Activity	Y1	Y2	Y3	Y4	Y5
Spot treatment control of noxious weeds with broadleaved herbicide (Mid Summer)	■	■	■	■	■
Mowing with cuttings left in-situ (July)	■				
Selective mowing (Late Summer)		■	■	■	■
Mowing of 'rides' to establish contrasting heights of herbage (Late Summer)		■	■	■	■
Selective grazing (Summer)		■	■	■	■
Possible reseeding of failed areas			■		■
Hedge cutting			■	■	■

■ *Action Within this Period*

□ *No Action Required*

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Detailed Planting Proposals : Avenue Trees : Total Number of Trees to be Planted on Site: 120

The planting of avenue trees is proposed to reinstate the lost Lea Castle parkland Avenue, which formerly dissected the Site, linking North and South lodges.

Proposed Species Composition:

Planting Specification - Avenue Trees			
Species	**Common Name**	**Height (cm)**	**Bareroot (BR)**
Fagus sylvatica f. purpurea	Purple Beach	Feathers 1.8+	BR
Fagus sylvatica	Beach	Feathers 1.8+	BR
Tilia cordata	Lime	Feathers 1.8+	BR

Preparation / Sowing:

To recreate and enhance the parkland setting and reintroduce vegetative structure

Avenue trees to be planted at 15m centres. All stock to be pit planted in pits 1m x 1m x 1m and backfilled with 50% original material and 50% peat free tree compost. Trees are to be protected by Estate Tree Guards constructed from steel or wood of 1m in diameter and a height of 1.5m. If steel is to be used it is to be hot dip galvanised to prevent rusting and finished in black. Bark mulch is to be spread and the base of the tree and within the guard. Feathered trees to be secured to 1 1.5m tantalised stake by 2 plastic tree ties.

Management:

- Trees should be watered during any dry spell in the first growing season
- Hard weeding to take place to remove any weeds or any other vegetation emerging from within and surrounding the tree guard
- Tree guard and stake to be inspected to ensure their integrity
- The health of the tree to be monitored with any appropriate action to protect and ensure it health implemented
- Stake and ties to be removed at first available opportunity once the tree is growing and is stable.
- Monitoring of the management regime should be undertaken on an annual basis and appropriate action taken in liaison with the land owner and Worcestershire County Council/ Wyre Forest District Council Arboriculture Officers.

Detailed Planting Proposals : Parkland Trees : Total Number of Trees to be Planted on Site: 50

The planting of parkland trees is proposed to the agricultural parkland structure within the restored agricultural grassland / cropping, reflective of the former parkland setting.

Proposed Species Composition:

Planting Specification - Parkland Trees			
Species	**Common Name**	**Height (cm)**	**Bareroot (BR) / Root Stock (RS) / Container Grown (CG)**
Fagus sylvatica f. purpurea	Purple Beach	Feathers 1.8+	RS
Fagus sylvatica	Beach	Feathers 1.8+	BR
Tilia cordata	Lime	Feathers 1.8+	BR
Crataegus monogyna	Hawthorn	Feathers 1.8+	BR
Sequoioideae giganteum	Redwood/ Wellingtonia	Feathers 1.8+	CG
Cedrus atlantica	Atlas Cedar	Feathers 1.8+	CG

Preparation / Sowing:

To be planted in mixed species groups

All stock to be pit planted in pits 1m x 1m x 1m and backfilled with 50% original material and 50% peat free tree compost. Trees to be protected by 900mm tree guards secured to 1 1.5m tantalised stake by 2 plastic tree ties.

Management:

- Trees should be watered during any dry spell in the first growing season
- Hard weeding to take place to remove any weeds or any other vegetation emerging from within and surrounding the tree guard
- Tree guard and stake to be inspected to ensure their integrity
- The health of the tree to be monitored with any appropriate action to protect and ensure it health implemented
- Stake and ties to be removed at first available opportunity once the tree is growing and is stable
- Monitoring of the management regime should be undertaken on an annual basis and appropriate action taken in liaison with the land owner and Worcestershire County Council/ Wyre Forest District Council Arboriculture Officers.