

## SUTTON COURTENAY QUARRY – BRIDGE FARM

### AMENDED 5 YEAR OUTLINE AFTERCARE SCHEME TO ACCORD WITH THE REVISED PROPOSALS FOR EXTRACTING PHASE 4B BELOW WATER TABLE AND THE RESTORATION OF PHASE 4B TO OPEN WATER AND REED BEDS

OXFORDSHIRE COUNTY COUNCIL

APPROVED

DATE: 16/05/2019

APPLICATION No: P18/V2171/CM (MW.0094/18)

#### 1. Introduction

- This scheme is submitted as an amendment to the approved Aftercare Scheme ref. S055/A 'Re-amended 5 year Outline Aftercare Scheme' and restoration plan S55/87e as referenced in Condition 35 of the approved planning permission MW.0126/12 dated 17th September 2015. The site aftercare shall be fully implemented in accordance with this revised scheme and the revised restoration plan ref. S3/HAN/10/10D.
- The overall intention of the restoration and aftercare programme is to promote the rehabilitation of the site for nature conservation land use, comprising reed beds, lake margin grassland and native scrub habitats of high biodiversity value, as shown on the restoration plan S3/HAN/10/10D.
- The restoration scheme has been designed to minimise bird strike risk, comprising "backfill fingers" to avoid a large expanse of open water and with shoreline treatment to establish reed/scrub margins intended to deter large flocks of geese from having easy access onto lake margin grassland.
- The Operator will keep records of all aftercare steps undertaken, and will arrange for an annual aftercare meeting to be held on site, preferably in spring each year.
- The Operator will submit an annual aftercare report covering the steps undertaken during the previous 12 months, and proposals for the forthcoming 12 months, for discussion and agreement at site meetings, with the report to be submitted one month prior to the site meeting.
- The 5-year aftercare period will be deemed to commence on completion of soil placement in late summer for lake margin areas, and on completion of final re-grading of "backfill fingers".

#### 2. Lake Margin Grassland Aftercare Measures

##### 2.1 Cultivation and Establishment of Vegetation

- Following progressive placement of subsoil and overburden and regrading of lake margins to formation levels as per restoration plan, margins will be covered with maximum 300mm depth of topsoil from perimeter stores.
- Newly reinstated areas will be cultivated by a combination of discs and spring-tine harrows to achieve a fine firm seedbed.

- The lake margins will then be seeded with a grass/wildflower mix of UK provenance suitable for MG5 wet grassland, at a rate of approx. 3g per m<sup>2</sup>.
- The seed will be lightly covered by chain harrow then rolled by Cambridge roller.
- Grass will be sown preferably in approx. early September following summer soil placement, alternatively in the event of delayed earthworks and soil placement, or unfavourable autumn sowing conditions, over-winter cover will be established by natural regeneration, with cultivation and seeding delayed until suitable spring weather conditions in approx. April, with any advanced weed growth topped prior to cultivation and seeding.

## 2.2 Maintenance of Soil Fertility

- Given the site's previous arable use, it is unlikely that soils will be deficient in any major nutrients, therefore no additional fertilizer applications are anticipated during the aftercare period.
- Soils will be sampled and analysed for pH, P, K, Mg and % organic matter, as background information and to assess prospects of successful wildflower establishment.
- Low fertility conditions will be encouraged to reduce long term maintenance and facilitate wildflower colonisation.

## 2.3 Drainage

- Similarly, there are no proposals for soil underdrainage, and any minor surface undulations and low waterlogged spots will be allowed (and indeed encouraged) to maximise biodiversity value of the subsequent grass sward.

## 2.4 Management of Vegetation

- The lake margin grassland will be managed by mowing, anticipated twice per season for at least the first 2 years, in approx late July, which should be late enough to avoid nesting birds but prior to noxious weeds setting seed, and again in September.
- Once sward is well established, mowing may only be necessary once per season towards the end of the growing season in approx. late July/August after wildflowers have set seed.
- In the event of high residual fertility in the former arable soils, to be agreed at annual aftercare meetings, arisings from mowing will be cut and collected by forage harvester or baler and placed in habitat piles around perimeter to encourage grass snake.
- Once sward is sufficiently mature to tolerate selective herbicide applications, anticipated by year 2, MCPA, 2,4-D, Grazon 90 or other suitable selective herbicide will be applied to control all noxious broadleaved weeds, either as a spot application by napsack sprayer in the case of sparse weed growth, or alternatively by small boom sprayer mounted on quad bike, in the event of more extensive weed infestations.

- A band of vegetation approx 2m back from water's edge will be left un-cut to encourage tall rank grass, reeds, marginal aquatics and woody scrub vegetation, to deter easy access from lake onto grassland of large populations of geese or other wintering wildfowl, as mitigation against bird strike hazard.
- Limited "conservation grazing" of lake margin grassland may be encouraged towards the end of the 5-year aftercare period, if a suitable grazing tenant can be found, and subject to satisfactory establishment of dense shoreline vegetation to achieve bird strike mitigation, to test effectiveness of grazing management for longer term 20-year Extended Aftercare regime.

## 2.5 Access and Bird Hide

- Car park provision of approx. 15mx12m hardstanding will be installed near to operational site entrance as per approved restoration scheme.
- Appropriate bird hide will be constructed where indicated.
- Mown grass pathway will be installed and maintained over approx. 500m to bird hide, as per approved scheme, suitably screened from birds on lake by establishment of dense belt of vegetation and/or reshaped soil bunding.

## 3. Woodland and Marginal Scrub - Aftercare Measures

### 3.1 Cultivation & Seeding

- All lake margin planting areas will be cultivated and seeded in the same way as the remainder of lake margin grassland, and wet woodland islands will be allowed to naturally regenerate with grasses or over-seeded by hand if necessary.
- If soil is suitably dry, planting areas around the perimeters of water bodies will be ripped at 2m centres with agricultural subsoiling tine in late summer following soil placement, to a minimum depth of 45cm, to alleviate any compaction at the topsoil/subsoil interface, to set out planting areas and to provide localised cultivation at each planting station.
- In the event of delayed soil placement or unsuitable conditions for ripping in late summer/autumn, planting areas will be sown to grass but left un-ripped and un-planted during year 1, prior to ripping in appropriate weather conditions at the end of the first growing season, with subsequent planting in the winter of year 2.
- For planting areas on backfill "fingers", site preparation will be limited to re-grading and spreading out of overburden and soil forming materials, to the limit of effective reach of excavator, but with all soils being left loose and un-compacted on completion.
- Wet woodland blocks on backfill fingers will be left slightly higher than the remainder of reedbed areas and will vary from approx. 0.5m to 0.3m above early summer water levels, but many areas are likely to be inundated for much of the winter.
- Varied micro-topography will be created by mounding up where necessary, to provide some raised areas for planting of those species less tolerant of full flooding.

### 3.2 Establishment of Trees and Shrubs

- The majority of lake edge woodland is expected to be achieved by natural regeneration of willow species from windblown seed, but additional planting will be necessary both to enrich areas where natural colonisation may be inadequate (eg. up-wind shorelines), to provide increased species diversity and improved future structure, and to achieve establishment of woodland blocks in drier grassland areas away from lake edges, where natural colonisation is less likely to be successful.
- Scrub vegetation around Phase 4B shall be established by the planting of shrubby species only and these planting blocks shall be located at least 5m away from the lake edge to prevent the shading of littoral habitats.
- Locally native broadleaved trees and shrubs will be used, obtained from local sources if possible but otherwise from Forestry Commission Provenance Zones 404 or 405 suitable for central southern England.
- Species to be planted will comprise the following mixes:

Species	Size/cm	Dry Groups	Wet Woodland	Shrub only Areas	Type of guard
<i>Acer campestre</i>	40-60	10	10		60cm spiral
<i>Alnus glutinosa</i>	80-100		30		60cm spiral
<i>Betula pendula</i>	80-100	10			60cm Tubex
<i>Cornus sanguinea</i>	40-60		5	10	60cm Tubex
<i>Corylus avellana</i>	40-60	10		15	60cm Tubex
<i>Crataegus monogyna</i>	40-60	10		20	60cm Tubex
<i>Euonymus europaeus</i>	40-60	5		10	60cm Tubex
<i>Ligustrum vulgare</i>	40-60	5			60cm Tubex
<i>Populus tremula</i>	80-100	5	10		60cm spiral
<i>Quercus robur</i>	40-60	25			1.2m Tubex
<i>Rhamnus cathartica</i>	40-60	5		10	60cm Tubex
<i>Salix alba</i>	80-100	10	15		60cm spiral
<i>Salix caprea</i>	80-100		10	10	60cm spiral
<i>Salix viminalis</i>	80-100		10	15	60cm spiral
<i>Viburnum opulus</i>	40-60	5	10	10	60cm Tubex
<b>Total</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>	

- Trees and shrubs will be notch-planted where necessary, between December and March in the winter of year 1 or year 2, depending on timing of ripping as above, or once extent of natural willow regeneration has become apparent.
- Spacing of trees and shrubs will be varied between 2m and 3m centres with plants offset either side of rip lines to reduce regimented appearance, and with trees and shrubs in random intimate mixes. Closer planting centres of 1.5m will be undertaken where denser marginal shrub fringes are required to provide screening to the car

park and bird hide, or where robust enclosure is required to deter geese and other flocking wildfowl.

- Wet woodland blocks/willow carr on backfill fingers/islands will be planted at average 4m centres where necessary depending on extent of natural regeneration, with species selected according to micro-topography and soil wetness at each planting station.
- All stock will be individually guarded from rabbits as per attached schedule. In the event of significant and unacceptable browsing by geese or deer, taller tree shelters will be added as necessary.
- All weeds in minimum 90cm diameter spot around all accessible trees and shrubs (avoiding areas close to open water) will be controlled by applications of Glyphosate herbicide for at least the first 3 years.
- Noxious weeds within planting groups will be spot-treated with applications of appropriate selective herbicide at the optimum time in late spring/early summer if necessary.
- Any remaining tall stalky grass and unsightly weed growth between treated spots will be trimmed in late summer each year if necessary.
- All dead trees and shrubs will be replaced for the first 3 seasons after planting and thereafter sufficient to achieve minimum 90% overall stocking by the end of the aftercare period.
- Prior to the implementation of any lake margin grazing regime, tree groups will be fenced off where necessary to prevent damage by livestock.

#### 4. Reedbed Aftercare Measures

##### 4.1 Earthworks and Ground Preparation

- Majority of reedbed areas will be on backfilled fingers, which will be re-graded by excavator on completion of extraction or in the first available summer season when water levels are as low as possible, to achieve the final proposed average reedbed height of 47.5m aod. as per restoration design, which will be just below final proposed summer water level of 47.8m.
- Re-grading of fingers will aim to leave a rough and varied surface with assorted loose mounds and ditches to provide varied microtopography at or about the final water level.
- To allow safe access for planting, water level will be allowed to drop to 47.5m aod by removal of any outfall weir boards.

##### 4.2 Reed Establishment

- Reed cover will be ensured on the islands by means of establishing small planted and fenced foci of colonisation, from which reed growth will expand through natural processes to become the dominant vegetation.

- Planted foci will comprise a series 12m x 12m fenced enclosures each planted with 36 rootrainer cell grown *Phragmites australis*, set at 2m centres.
- Fenced blocks will be set out on the reed islands to cover approx. 10% of the total area of each finger, and will be supplemented where necessary by additional reed plugs planted at 5m centres and protected in individual 60cm x 20cm diameter Netlon mesh guards supported by 90cm treated softwood stake or 2 x 90cm bamboo canes.

#### 4.3 Management of Water Levels

- Base of outfall sluice at NE corner of site will be set at 47.5m aod.
- On completion of reed planting anticipated in approx June/July, water levels will be raised by blocking outfall sluice to achieve 5 -10cm water depth above final soil level, to provide optimum conditions for establishing reeds and to minimise competing weed growth.
- Water levels will then be allowed to rise naturally in the first winter after planting, and in the spring/early summer of year 2, water levels will be kept high to at least 47.8m a.o.d. by means of 30cm weirboard placed in outfall, to prevent willow germination on exposed reed bed islands.

#### 4.4 Maintenance of Reedbeds

- Any reeds in individual guards which fail to establish will be replaced with cell grown stock in late summer of year 2, on the assumption that water levels have dropped sufficiently for safe access.
- Otherwise, maintenance will comprise monitoring of success of establishment, replacement of significant losses of reeds within fenced blocks in the event of serious failure of more than say 30%, with further rootrainer stock or established clods/turves from elsewhere on site.
- At the end of the 3rd growing season, assuming reed establishment is progressing well, netting will be removed from fenced blocks and taken off site.
- Natural regeneration of willows will be monitored and measures taken to prevent excessive establishment, either by cutting with clearing saw followed by raising of water levels to prevent coppice re-growth, or hand pulling in the case of limited tree encroachment.