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INTRODUCTION

Background

4.1 This chapter provides a summary of the Ecological Impact Assessment (EclA) conducted by SLR Consulting Ireland (SLR) to inform the wider Environmental Impact Assessment (EIA) process and production of an Environmental Impact Statement (EIS) to accompany the planning application by Roadstone Wood Limited for the continuance of use of the existing limestone quarry and ancillary processing and manufacturing facilities at Huntstown Quarry, Finglas, Dublin.

Purpose of the Ecological Impact Assessment

4.2 The EclA can be considered as having three main purposes:

- to provide an objective and transparent assessment of the ecological effects of a proposed development or activity;
- to permit objective and transparent determination of the consequences of the proposals in terms of national, regional and local policies relevant to nature conservation; and
- to demonstrate that a proposed development or activity will meet the legal requirements relating to habitats and species.

4.3 This EclA has been undertaken in accordance with the Environmental Protection Agency's (EPA) guidelines^{1 2} and guidelines published by the Institute of Ecology and Environmental Management (IEEM)³ ('the IEEM Guidelines') and follows a standard approach based upon the description of the existing baseline conditions within the application site; an evaluation of the habitats and species present within the application site; the identification of potential ecological effects of the proposed continuance of quarry operations; and an assessment of the likely significance of identified impacts on the valued ecological receptors (VERs) both within the application site and within the zone of influence of the Huntstown Quarry. Where a significant negative impact has been identified suitable mitigation measures to prevent, reduce or offset the level of impact are provided with any residual effects, following the implementation of mitigation and enhancement measures, identified and assessed.

Legislative Context

4.4 The following legislation is of relevance to the ecology and nature conservation in respect to the continuance of quarrying operations:

- European Communities (Natural Habitats) Regulation 1997 (as amended);

¹ Environmental Protection Agency (2002). *Guidelines on the Information to be Contained in Environmental Impact Statements*. Environmental Protection Agency, Dublin.

² Environmental Protection Agency (2003). *Advice Notes on Current Practice (in the Preparation of Environmental Impact Statements)*. Environmental Protection Agency, Dublin.

³ Institute of Ecology and Environmental Management (2006). *Guidelines for Ecological Impact Assessment in the United Kingdom*.

- The Wildlife Act 1976;
- The Wildlife (Amendment) Act 2000; and
- Flora (Protection) Order 1999.

METHODOLOGY

Establishment of Baseline Conditions

- 4.5 Baseline ecological data was collated through a combination of desk-based study and field survey consistent with current standard methodologies and published good practice guidelines.
- 4.6 The area of study included all land within the red line application boundary (167.5 hectares (ha)) for the continuation of quarrying and associated activities at Huntstown Quarry (herein referred to as the quarry site) as well as important ecological sensitive receptors within the zone of influence of the quarry site with the potential to be directly or indirectly affected by the continuation of quarrying operations.

Desk-based Study

- 4.7 A preliminary desk-based study was undertaken and involved collating data from a number of organisations and examining published data relating to the application site and in a defined search area centred on this site. Data included details statutory and non-statutory designated nature conservation sites and protected and notable species within a 2km radius of the site.
- 4.8 Data sources used included information held by the National Parks and Wildlife Service (NPWS) (www.npws.ie) including their interactive mapping facility (www.designatedareas.ie) and the National Biodiversity Data Centre (NBDC) (www.biodiversityireland.ie).

Field Survey

- 4.9 The scope of the ecological field surveys was defined on the basis of known and the potential ecological interest within the quarry site and best practice⁴. Specialist surveys were carried out during 2010 and 2011 for habitats and for the collection of data on the presence of, and/or the habitat potential for, protected species of fauna.

Habitat and Vegetation Survey

- 4.10 A habitat survey was conducted at the quarry site on 8th March 2010 and repeated on 8th July 2010 and 6th June 2011 by a senior ecologist from SLR. The survey was conducted following a standard methodology in accordance with Fossitt (2009)⁵ to Level 3 and involved the production of a map of the

⁴ Institute of Environmental Assessment (1995). *Guidelines for Baseline Ecological Assessment*. Chapman and Hall (E & F N Spon), London.

⁵ Fossitt, J. A. (2000). *A Guide to Habitats in Ireland*. The Heritage Council, Ireland.

habitats present using colour codes and target notes (TN) to describe any feature of particular ecological interest, refer to Appendix 4-A.

- 4.11 This survey method was extended to include the recording of additional information on habitats and species, including any evidence of, or potential presence of, statutorily protected species, other species of conservation significance, or any other features of note and that may require mitigation or an ecologically sensitive design in respect of any continuation of quarrying at Huntstown Quarry.

Survey Limitations

- 4.12 The habitat survey was conducted at optimum times to undertake such surveys in order to record spring and summer species of flora. It is considered therefore that the survey results are representative of the habitats within the application site, and include the dominant and characteristic species of flora.
- 4.13 The lack of evidence of any one particular protected species does not necessarily preclude its presence at the site either at this current time or in the future. It is considered however, that the survey results accurately represent the baseline value of the study area for protected and notable species at the current time.

Assessment Methodology

- 4.14 The methodologies used to determine the value of ecological resources, to characterise impacts of the proposed scheme, and to assess the significance of impacts and any residual effects area described below. This approach is in accordance with the EPA guidance and the IEEM guidelines.

Evaluation of Ecological Features

- 4.15 IEEM suggest that to ensure a consistency of approach, ecological features are valued in accordance with the geographical frame of reference, as defined below:
- International
 - National (Ireland)
 - Regional (County Dublin)
 - District (East Finglas)
 - Local (Huntstown Quarry and surrounding area), and/or
 - within immediate zone of influence only or less than local (Huntstown Quarry only)
- 4.16 The above categories are then applied to the features identified in baseline surveys and desk-top studies. Some feature can already be recognised as having ecological value and, as such, they may be designated as statutory or non-statutory nature conservation sites. Other features may require an evaluation based upon their previously un-assessed biodiversity value and the rationale for grading such features is provided below.

- 4.17 For features that have not been formally recognised by a designation, an evaluation based upon the IEEM guidelines has been undertaken. The features being evaluated are considered in the context of the site and locality. In this way it is possible to provide a more accurate assessment of the impacts in the locality.
- 4.18 The criteria used to determine the biodiversity value of a species or features that may support a species include the following general considerations
- size of populations in the local geographic context;
 - rarity at a geographical level (international, national or local);
 - endemism and locally distinct varieties or sub-species;
 - species on the edge of their geographic range;
 - species-rich assemblages of a larger taxonomic grouping, e.g. herpetofauna or over-wintering birds;
 - plant communities, ecosystems or habitat mosaics/ associations that provide habitat for any of the above species or assemblages; and
 - populations of species considered as significant under locally published guidelines or red data books.
- 4.19 All species and populations of species, including those with statutory protection, are evaluated on the same basis. The typical unit of a species for the purposes of evaluation is a viable population, i.e. a breeding adult(s) with sufficient habitat(s) to raise young. Where a site does not include sufficient habitat to support a viable population, then the assessed species value should be informed by the extent of the habitat required to support a viable population and the proportion of this habitat within the site. Additional weight would be given where a site supports habitats that are important or critical for the maintenance of a species population at some point in its lifecycle, e.g. open water habitats for over-wintering birds or hibernation areas for bats or amphibians.
- 4.20 It should be noted that contribution to the local population is the primary criterion used for evaluating species. Even where a species is protected under European and Irish statute, the presence of a small population on a site within any specific area where this species is widespread is primarily assessed as valuable at a geographic level where it contributes >1% of the population present at that level. Equally, a particular feature on a site may attract large numbers of an unprotected species that has limited distribution and this may represent a feature of greater importance.

Assessment of Impacts

- 4.21 Impacts are characterised in terms of the criteria summarised in Table 4.1, based on the IEEM methods of assessment. These factors are brought together to assess the significance of the impact on a particular VER.

Table 4-1: Key Considerations when Characterising Impacts

Description	Definition
Direction of impact	Adverse or beneficial impact
Probability of occurring	Broadly defined on 3 levels: Certain, Probable or Unlikely
Complexity	Direct, Indirect or Cumulative
Extent and Context	Area/number affected and % of total
Magnitude	Describes the severity of effect as major, moderate, minor or negligible.
Duration	Permanent or Temporary in ecological terms (e.g. within the lifetime of the species affected)
Reversibility	Whether or not the effect can be reversed
Area	Expressed as area or percentage of the study area

Assessing Significance

- 4.22 An assessment is then made of the likely significance of the impact prior to mitigation.
- 4.23 Impacts are defined as being negative, neutral or positive. The term significant is independent of the value of the receptor. A significant impact is defined as an impact on the integrity of a defined ecosystem and/or conservation status of habitats or species within a geographical area.

Mitigation and Avoidance

- 4.24 Where a potential negative impact has been identified, mitigation measures have been formulated using best practice techniques and guidance to prevent, reduce or offset a significant effect.

Residual Effects

- 4.25 The final part of the assessment is to assign a level of significance of the residual impact of this scheme in terms of their significance from an ecological perspective and also the implications of those effects from a legal and policy perspective following mitigation. This is based on the sensitivity of the ecological resource that will be affected, and the magnitude of the predicted impact. The degree of confidence in the likely success of mitigation or compensation, based upon published studies and the experience of the assessor, is also made and any uncertainties are clearly expressed.
- 4.26 Residual impacts are characterised in terms of their direction, permanence, certainty and reversibility. These factors are brought together to assess the

magnitude of the impact on a particular valued ecological receptor using the following criteria:

- Major – a permanent or long-term effect on the extent/size or integrity of a site, habitat, species assemblage/ community, population or group. If adverse, this is likely to threaten its sustainability; if beneficial, this is likely to enhance its conservation status.
- Moderate - a permanent or long-term effect on the extent/ size or integrity of a site, habitat, species assemblage/ community, population or group. If adverse, this is unlikely to threaten its sustainability; if beneficial; this is likely to be sustainable but is unlikely to enhance its conservation status.
- Minor – a short-term but reversible effect on the extent/ size or integrity of a site, habitat, species assemblage/ community, population or group that is within the range of variation normally experienced between years.
- Negligible - a short-term but reversible effect on the extent/ size or integrity of a site, habitat, species assemblage/ community, population or group that is within the range of variation normally within the normal range of annual variation.

ECOLOGICAL BASELINE CONDITIONS

4.27 This section provides a general overview of the existing ecological baseline conditions within the existing Huntstown Quarry and in the wider local environment.

General Site Description

- 4.28 Huntstown Quarry is a large operational limestone rock quarry complex with an extraction area covering 55.9 hectares (ha) that has been worked since the late 1960's within a total landholding of Roadstone Wood Limited covering 211ha.
- 4.29 The site comprises four main extraction areas (i.e. north quarry, central quarry, south quarry and western quarry); an area that contains the ancillary infrastructure of the quarrying operations including offices, workshops and concrete and asphalt production plants; access routes; remnant former fields and areas of overburden stripped from the extraction areas that has been utilised for the provision perimeter screening bunds. For a full description of the quarry and its uses please refer to Chapter 1 of the EIS.
- 4.30 The north quarry has undergone some progressive restoration over a number of years with inert materials being used to infill parts of the former quarry void.
- 4.31 The surrounding land-use is a mixture of urban and commercial development with associated infrastructure including Dublin Airport and agricultural land and is typical of an urban fringe landscape.

Existing Planning Permission

4.32 The existing quarry and ancillary facilities operate under planning permission F03A/1430 (ABP PL06F.206789). Planning conditions in relation to ecology as part of the existing grant of planning permission are as follows:

4.33 Condition No. 20 relates to the implementation of a management protection plan for the 'orchid stand' and 'wetland' area. Condition No. 21 did not permit further works to be carried out to the wildlife area on top of the 'spoil heap' northwest of the central quarry, east of the western quarry, without prior agreement from the Planning Authority. Condition No. 22 relates to the implementation of an ecological monitoring program for the site.

20. The applicant shall within 6 months of the date of grant of planning permission, submit details of a management protection plan for the 'orchid stand' and 'wetland' area. This shall include detailed protection measures during and after quarrying operations.

REASON: In order to preserve these ecologically important habitats.

21. No further works to be carried out to the wildlife area on top of the 'spoilheap' northwest of the central quarry, east of the western quarry, without prior written agreement of the Planning Authority.

REASON: In order to reserve this spoil for future infilling of quarries.

22. In order to ensure regular monitoring of the areas of ecological interest and evaluate the impact of the quarrying operations on these sites, the applicant should be conditioned to submit for the written agreement of the Planning Authority an ecological monitoring program for the lands in its ownership. The said program shall be submitted within 6 months of the date of grant of planning permission.

REASON: In order to preserve these ecologically important habitats, In the interest of proper planning and sustainable development of the area.

Nature Conservation Sites

4.34 The proposed development site is not subject to any statutory nature conservation designation and there are no such sites within a 2km radius of the development site.

Habitats

4.35 The habitat types recorded within the quarry site based on the classification as defined by Fossitt (2000) are presented in Table 4.2.

Table 4-2: Summary of Habitat Types Recorded at Huntstown Quarry

Level 1 Habitat Hierarchy	Level 2 Habitat Hierarchy	Level 3 Habitat Hierarchy
Woodland & Scrub	WD – Highly modified / non-native woodland	WD1 – Broadleaved woodland WD3 – Mixed broadleaved/conifer woodland
	WS – Scrub/transitional woodland	WS1 – Scrub WS2 – Immature woodland
	WL – Linear woodland/scrub	WL1 – Hedgerows
Grassland & Marsh	GA- Improved grassland	GA1 – Improved agricultural grassland GA2 – Amenity grassland (improved)
	GS – Semi-natural grassland	GS1 – Dry calcareous and neutral grassland GS2 – Dry meadows and grassy verges GS4 – Wet grassland
	GM – Freshwater marsh	GM1 – Marsh
Freshwater	FL – Lakes and ponds	FL8 – Other artificial lakes and ponds
	FW – Watercourses	FW4 - Drainage ditches
	FS - Swamps	FS1 – Reed and large sedge swamps FS2 – Tall-herb swamps
E - Exposed rock and disturbed ground	ER – Exposed rock	ER2 – Exposed calcareous rock
	ED – Disturbed ground	ED2 – Spoil and bare ground ED3 – Recolonising bare ground ED4 – Active quarries and mines
B - Cultivated and built land	BC - Cultivated land	BC1 – Arable crops
	BL - Buildings and artificial surfaces	BL3 – Buildings and artificial surfaces

4.36 Figures 4-1 to 4-4 respectively show the location and extent of the habitats recorded within the quarry site along with the location of associated Target Notes (TN). A broad description of each Level 3 habitat is provided below with a detailed description of each TN included at Appendix 4-A.

Woodland and Scrub (WD1, WD3, WS1, WS2 and WL1)

4.37 The majority of woodland on the quarry site consists of areas of broadleaved plantation woodland typically consisting of relatively young fast growing species including alder, ash, sycamore and some willow planting that is supplemented in places with further planting of predominantly broadleaved species such as birch, common hawthorn, blackthorn, dogwood, sessile oak and whitebeam as well as some conifers particularly along the south-eastern boundary of the South Quarry. These plantation woodlands provide screening of the quarry from the surrounding land and from within operational areas inside the quarry site.

- 4.38 Natural regeneration of scrub is evident across the site predominantly consisting of ash, common hawthorn and goat willow particularly on the lower slopes of older spoil mounds.

Grassland and Marsh (GA1, GA2, GS1, GS2, GS4 and GM1)

- 4.39 Grassland habitats are widely distributed across the site consisting of broad range of grassland communities.
- 4.40 Areas of grassland with affinities to calcareous grassland habitat-type are predominantly found within the pasture fields that have remained within the quarry and which were probably typical across the whole site before the onset of quarrying operations. These generally support a good diversity of species and are largely managed through the grazing of horses although outside the field system rabbits are primarily responsible in maintaining the sward and diversity of species within the active parts of the quarry site. There are five areas of particular interest within the quarry site and are typically defined by the high numbers of orchids (Pyramidal Orchid and Common Spotted Orchid) that are present in the sward (TN20, TN60, TN62, TN97 and TN103).
- 4.41 Where quarrying operations has caused high levels of disturbance neutral grasslands have developed particularly along on roadside verges and over the older spoil mounds and bunds that are typically less diverse than the areas of the calcareous grassland habitat-types.
- 4.42 In damper areas of the site wet grassland and marsh habitats are quite often found in a mosaic with other grassland communities but a field north of South Quarry does support the largest extent of wet grassland on the quarry site (TN76).

Freshwater (FL8, FW4, FS1 and FS2)

- 4.43 The main areas of permanent open standing water on the site can be found in the attenuation lagoons that have been constructed in the central part of the site that receive pumped water from the quarry voids. In addition, there are numerous smaller ephemeral ponds typically found in low-lying depressions across the site but also include some constructed ponds on top of the ecological area located to the east of the western quarry area.
- 4.44 The main drainage ditches are found in the north and through the central parts of the site that predominantly receive surface water from the active parts of the quarry site. In the central part of the quarry site a relatively large area of swamp (TN77) has developed in a low-lying area through which the main central drainage ditch flows.

Exposed Rock and Disturbed Ground (ED2, ED3 and ED4/ER2)

- 4.45 Large areas of the site support habitats associated with active quarrying including the four main active quarries and associated exposed calcareous

rock; spoil and bare ground created through the quarrying process; and recolonising bare ground typically supporting ephemeral and short perennial vegetation communities.

Cultivated and Built Land (BC1 and BL3)

- 4.46 A large part of the central area of the site is where the main infrastructure and facilities associated with the quarrying operations at Huntstown Quarry is located, comprising a number of buildings, structures, storage areas and roads and tracks.
- 4.47 On the western side the site there is some arable fields that are used predominantly for the production of potatoes.

Flora

Protected and Notable Species of Flora

- 4.48 During the habitat surveys of the development site no protected or rare species of flora were recorded on, or immediately adjacent the development site.
- 4.49 Previous studies at this site recorded a total of seven notable species of plants at Huntstown Quarry including Lesser Water-plantain (*Baldellia ranunculoides*), Greater Pond Sedge (*Carex riparia*), Blue Fleabane (*Erigeron acer*), Sharp-slowered Rush, (*Juncus acutiflorus*), Leafy Toad Rush (*Juncus foliosus*), Blunt-flowered Rush (*Juncus subnodulosus*) and Prickly Lettuce (*Lactuca serriola*). Of these species only Greater Pond Sedge was found during the habitat surveys in 2010 and 2011 in the series of ponds at TB31.

Non-native Invasive Species

- 4.50 Stands of the highly invasive Japanese knotweed were found to be present at two locations within the quarry site in the North Quarry and on the ecological mound at TN16 and TN35 respectively.
- 4.51 No other non-native invasive species of flora was found to be present on, or immediately adjacent, the development site.

Mammals

Badger (Meles meles)

- 4.52 Badgers have historically been seen by security staff at Huntstown Quarry and whilst the habitats within the quarry site and in the immediate surrounding area provide good opportunities for badgers, no evidence of badger (i.e. setts, tracks, latrines, snuffle holes or hairs) was found during the habitat surveys.

Bats

- 4.53 All of the existing buildings and structures within the quarry site are considered to have negligible bat roosting potential due to their construction and current condition. During an external inspection of the buildings in July 2010 and June 2011 no evidence was found to suggest bats have used, or are currently using these structures for roosting purposes (i.e. droppings, urine staining, scratch marks and feeding remains).
- 4.54 The majority of trees within the quarry site are considered to provide limited roosting potential for bats due to their age and condition with no obvious features offering bat roosting potential (i.e. holes and cavities, cracks and splits in major limbs, loose bark, ivy cover and dense epicormic growth) found and are assessed as Category 3 (i.e. they have negligible potential to support roosting bats) in accordance with the current published criteria⁶. Where mature trees are present these would appear to be in good condition and again do not have any obvious bat roosting features and are assessed as being no greater than Category 2b trees (i.e. they have low to moderate potential to support roosting bats).
- 4.55 The exposed rock faces provide numerous cracks and crevices that have the potential to be utilised by bats however, these areas are subject to high levels of disturbance and it is considered unlikely that bats are currently roosting in any of the active extraction areas.
- 4.56 The habitats within the development site provide some opportunities for foraging bats in particular the commoner species, i.e. common pipistrelle (*Pipistrellus pipistrellus*) and brown long-eared bat (*Plecotus auritus*), with good connective corridors, predominantly hedgerows, linking into the wider surrounding countryside. However, given the availability of large areas of alternative good quality foraging habitats in the wider surrounding area it is highly unlikely the site is important or critical to any particular species of foraging bat.

Irish Hare (*Lepus timidus hibernicus*)

- 4.57 Irish hares have historically been recorded on parts of Huntstown Quarry and individuals observed across the site in 2010 and 2011.
- 4.58 Solitary Irish hare have been recorded on the quarry site in 2010 and 2011.

Other Mammal Species

- 4.59 Other mammal species known to occur at Huntstown Quarry include wood mouse (*Apodemus sylvaticus*), rabbit (*Oryctolagus cuniculus*), brown rat (*Rattus norvegicus*) and fox (*Vulpes vulpes*).
- 4.60 The habitats present in the quarry site provide suitable habitat for all of the aforementioned species of mammals, with evidence of rabbit and fox

⁶ Bat Conservation Trust (2007). *Bat Surveys – Good Practice Guidelines*. Bat Conservation Trust, London.
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recorded in 2010 and 2011. The habitats are also suitable for hedgehog (*Erinaceus europaeus*) and stoat (*Mustela ermine*) although no evidence was found to suggest the presence of these species during the habitat surveys.

Birds

4.61 Survey visits for both breeding and wintering birds have been undertaken to record the birds at the quarry site on 8/9th July 2010 and 3rd March 2011 respectively.

Breeding Birds

4.62 A total of 40 species of birds were recorded at the quarry site during the survey visit in July 2010 the majority of which are believed to be or have the potential to be breeding on the site including Peregrine that have historically bred in the North Quarry. This compares with a previous full bird survey carried out in 2002 that recorded a total of 41 species with all the notable species still present as breeding or at the site in winter (see below for wintering birds).

4.63 Of the species recorded, three species are red listed⁷ and six amber listed⁸ Birds of Conservation Concern⁹. Table 4.3 provides a summary of the species recorded during the breeding season visit.

Table 4.3: Summary of Breeding Birds Recorded at the Quarry Site (July 2010)

Scientific Name	Common Name	Red List	Amber List
<i>Accipiter nisus</i>	Sparrowhawk		
<i>Anas platyrhynchos</i>	Mallard		
<i>Anthus pratensis</i>	Meadow Pipit		
<i>Apus apus</i>	Swift		√
<i>Buteo buteo</i>	Buzzard		
<i>Carduelis cannabina</i>	Linnet		√
<i>Carduelis carduelis</i>	Goldfinch		
<i>Carduelis chloris</i>	Greenfinch		
<i>Columba oenas</i>	Stock Dove		√
<i>Columba palumbus</i>	Woodpigeon		
<i>Corvus cornix</i>	Hooded Crow		
<i>Corvus monedula</i>	Jackdaw		
<i>Cyanistes caeruleus</i>	Blue Tit		

⁷ Red list species are those that are Globally Threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a substantial recovery.

⁸ Amber list species are those with an unfavourable conservation status in Europe; those whose population or range has declined moderately in recent years; those whose populations has declined historically but made a substantial recovery; rare breeders; and those with international important or localised populations.

⁹ Lynas, P., Newton, S. F., & Robinson, J. A. (2009). *The Status of Birds in Ireland: An analysis of Conservation Concern 2008-2013*. Irish Birds, 8(2): 149-166.

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Scientific Name	Common Name	Red List	Amber List
<i>Emberiza schoeniclus</i>	Reed Bunting		
<i>Embriza citrinella</i>	Yellowhammer	√	
<i>Erithacus rubecula</i>	Robin		
<i>Falco peregrines</i>	Peregrine		
<i>Falco tinnuculus</i>	Kestrel		√
<i>Fringilla coelebs</i>	Chaffinch		
<i>Gallinula chloropus</i>	Moorhen		
<i>Hirundo rustica</i>	Swallow		
<i>Larus argentatus</i>	Herring Gull	√	
<i>Larus fuscus</i>	Lesser Black-backed Gull		√
<i>Larus ridibundus</i>	Black-headed Gull	√	
<i>Motachilla cinerea</i>	Grey Wagtail		
<i>Motacilla alba</i>	Pied Wagtail		
<i>Parus major</i>	Great Tit		
<i>Phasianus colchicus</i>	Pheasant		
<i>Phylloscopus collybita</i>	Chiffchaff		
<i>Phylloscopus trochilus</i>	Willow Warbler		
<i>Pica pica</i>	Magpie		
<i>Prunella modularis</i>	Dunnock		
<i>Pyrhula pyrrhula</i>	Bullfinch		
<i>Riparia riparis</i>	Sand Martin		√
<i>Sylvia atricapilla</i>	Blackcap		
<i>Sylvia communis</i>	Whitethroat		
<i>Troglodytes troglodytes</i>	Wren		
<i>Turdus merula</i>	Blackbird		
<i>Turdus philomelos</i>	Song Thrush		
<i>Turdus viscivorus</i>	Mistle Thrush		

Wintering Birds

4.64 A total of 38 species of birds were recorded at the quarry site during the survey visit in March 2011. Table 4.4 provides a summary of the species recorded and the total counts for the site and maximum counts made at any given time.

Table 4.4: Summary of Wintering Birds Recorded at the Quarry Site (March 2011)

Scientific Name	Common Name	Total Count	Maximum Count
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Scientific Name	Common Name	Total Count	Maximum Count
<i>Anas crecca</i>	Teal	5	5
<i>Anas platyrhynchos</i>	Mallard	11	4
<i>Ardea cinerea</i>	Grey Heron	3	1
<i>Buteo buteo</i>	Buzzard	7	2
<i>Carduelis cabaret</i>	Lesser Redpoll	4	2
<i>Carduelis cannabina</i>	Linnet	2	1
<i>Carduelis carduelis</i>	Goldfinch	6	3
<i>Carduelis chloris</i>	Greenfinch	8	2
<i>Carduelis spinus</i>	Siskin	2	2
<i>Columba palumbus</i>	Woodpigeon	229	50
<i>Corvus corax</i>	Raven	5	2
<i>Corvus cornix</i>	Hooded Crow	46	10
<i>Corvus frugilegus</i>	Rook	14	6
<i>Corvus monedula</i>	Jackdaw	203	45
<i>Emberiza citrinella</i>	Yellowhammer	1	1
<i>Emberiza schoeniclus</i>	Reed Bunting	1	1
<i>Erithacus rubecula</i>	Robin	11	1
<i>Falco peregrinus</i>	Peregrine	3	2
<i>Fringilla coelebs</i>	Chaffinch	10	1
<i>Gallinago gallinago</i>	Snipe	6	5
<i>Gallinula chloropus</i>	Moorhen	1	1
<i>Larus argentatus</i>	Herring Gull	8	4
<i>Motacilla alba</i>	Pied Wagtail	5	2
<i>Motacilla cinerea</i>	Grey Wagtail	2	2
<i>Parus caeruleus</i>	Blue Tit	22	4
<i>Parus major</i>	Great Tit	7	1
<i>Phalacrocorax carbo</i>	Cormorant	1	1
<i>Phasianus colchicus</i>	Pheasant	5	2
<i>Pica pica</i>	Magpie	62	15
<i>Prunella modularis</i>	Dunnock	10	1
<i>Pyrrhula pyrrhula</i>	Bullfinch	3	2
<i>Regulus regulus</i>	Goldcrest	4	1
<i>Sturnus vulgaris</i>	Starling	46	30
<i>Troglodytes troglodytes</i>	Wren	7	1
<i>Turdus iliacus</i>	Redwing	39	20
<i>Turdus merula</i>	Blackbird	26	4
<i>Turdus philomelos</i>	Song Thrush	11	4
<i>Turdus viscivorus</i>	Mistle Thrush	4	2

Reptiles

- 4.65 There are no historical records for Common Lizard (*Zootoca vivipara*) at Huntstown Quarry.
- 4.66 Common lizard is a species that can be found in wide range of habitats with parts of the quarry site considered to provide suitable habitat for this species although no individual animals were observed during any of the habitat surveys in 2010 and 2011 or during previous fieldwork undertaken at this site.

Amphibians

- 4.67 Both Common Frog (*Rana temporaria*) and Smooth Newt (*Lissotriton vulgaris*) have historically been recorded at Huntstown Quarry with the site providing suitable breeding and terrestrial habitat for both these species.
- 4.68 In 2011, common frog was found to be breeding at a number of locations including the waterbodies at TN55 and TN77. No evidence was found to confirm smooth newts breeding on the site however, it is considered that smooth newts were breeding at TN23 with both male and female smooth newts observed at this location.

Invertebrates

- 4.69 Habitats recorded on the site provide opportunities for a wide range of invertebrate taxa. During habitat survey a number of common and widespread species of Lepidoptera, Odonata and other groups of invertebrate taxa were observed. No specially rare or notable species of invertebrates have been recorded during any visits to the quarry site.
- 4.70 Whilst no site is without invertebrate interest, it is considered unlikely that the site is important or critical to any particular individual species or groups of terrestrial invertebrates given the large extent of alternative high quality habitats within the immediate and wider surrounding area.

Other Protected, Rare and Notable Species

- 4.71 During the habitat surveys, no other protected, rare or notable species were recorded. Though the site may support low numbers of common and widespread species it is considered highly unlikely that any other specially protected species would be present.

Predicted Trends

- 4.72 In the absence of continuing quarrying operations at Huntstown Quarry, the existing quarried areas would be restored through a restoration plan to provide agricultural grassland. The remaining un-worked areas within the quarry site, subject to the current management regime, would be unlikely to change significantly in the short-time from the current baseline conditions.

FLORA AND FAUNA 4

- 4.73 Over the longer term, the quarry would be restored to agricultural land as part of an existing restoration plan and under a condition of planning consent granted in respect of quarrying operations.

ECOLOGICAL EVALUATION

Evaluation of Ecological Receptors

- 4.74 An evaluation of the ecological features, including habitats and species, identified through the findings of desk-based study and field survey is summarised in Tables 4.4 and Table 4.5 respectively.

Table 4.5: Evaluation of Habitats

Level of Value	Receptor	Location	Rationale
District	GS1 – Dry calcareous and neutral grassland (with high densities of orchids)	North Quarry TN20; Central Quarry TN60 and TN62; and South Quarry TN97 and TN103	A restricted habitat in Ireland. Small fields and patches of predominantly calcareous grassland that typically does not show strong characteristics of this grassland type but nonetheless supports a good diversity of herbaceous species and is notable for the high densities of orchids including pyramidal orchid and common spotted orchid.
Local	GS1 - Dry calcareous and neutral grassland (without high densities of orchids)	Widely distributed throughout the quarry site	A habitat typically with a good diversity of species but typically with less species more indicative of neutral grassland and without high densities of orchids.
	WL1 – Hedgerows	Widely distributed throughout the quarry site	Protected under the Wildlife Act 1976 as amended by the Wildlife (Amendment) Act 2000 Typically common and widespread habitat and although species-poor and not the best examples of hedgerows in the local area still provide opportunities for a range of species and providing wildlife corridors.
Within the zone of immediate influence only	WD1 – Broadleaved woodland	Widely distributed throughout the quarry site	A common and widespread habitat typically consisting of relatively young plantation woodland that due to its age and structure currently provides little ecological value but does provide suitable habitat for birds and some groups of invertebrates.

FLORA AND FAUNA 4

Level of Value	Receptor	Location	Rationale
Within the zone of immediate influence only	WD3 – Mixed broadleaved/conifer woodland	South Quarry	A common and widespread habitat that due to its age and structure currently provides little ecological value but does provide suitable habitat for breeding and foraging birds and some groups of invertebrates.
	WS1 – Scrub	Widely distributed throughout the quarry site	Typically common and widespread habitat providing opportunities for a number of bird species for breeding and foraging.
	WS2 – Immature woodland	Widely distributed throughout the quarry site	Typically common and widespread habitat providing limited opportunities for wildlife at this current time except for some groups of invertebrates.
	GS2 – Dry meadows and grassy verges	Widely distributed throughout the quarry site	Typically common and widespread habitat that is generally rather species-poor but due to its extent and lack of management provides suitable habitat for a range of species including mammals, birds, reptiles and invertebrates in the context of the wider surrounding area.
	GA1 – Improved agricultural grassland	Within RWL landholding but not in quarry site	Typically common and widespread habitat of low ecological value but can provide habitat for a range of species.
	GA2 – Amenity grassland (improved)	Entrance to Huntstown Power Station	Typically common and widespread habitat of low ecological value and provides limited opportunities for wildlife
	GM1 – Marsh	Widely distributed throughout the quarry site	Typically common and widespread habitat which provides suitable habitat for invertebrates
	FL8 – Other artificial lakes and ponds	Widely distributed throughout the quarry site	Typically common and widespread habitat which provides suitable habitat for amphibians and invertebrates.
	FW4 - Drainage ditches	North and central parts of the quarry site	Typically common and widespread habitat which on this site periodically run dry but which can support a range of species.

FLORA AND FAUNA 4

Level of Value	Receptor	Location	Rationale
Within the zone of immediate influence only	FS1 – Reed and large sedge swamps	Widely distributed and developing throughout the quarry site but main extent at TN77	Typically common and widespread habitat that provides suitable habitat for a range of species including birds, amphibians and reptiles.
	FS2 – Tall-herb swamps	North Quarry area	Typically common and widespread habitat which provides suitable habitat for invertebrates.
	ED2 – Spoil and bare ground	Widely distributed and throughout the quarry site	An anthropogenic habitat providing little opportunities wildlife except for some groups of invertebrates
	ED3 – Recolonising bare ground	Widely distributed and throughout the quarry site	Typically common and widespread habitat that are generally species-poor but provide suitable habitat for a number of species in particular invertebrates.
	ED4 – Active quarries and mines / ER2 – Exposed calcareous rock	North, Central and South Quarries	A fairly common and widespread anthropogenic habitat providing opportunities for a number of species including birds and invertebrates.
	BC1 – Arable crops	One field on western side of site	An anthropogenic habitat providing little opportunities wildlife.
	BL3 – Buildings and artificial surfaces	Existing infrastructure on site	An anthropogenic habitat providing little opportunities wildlife.

FLORA AND FAUNA 4

Table 4.6: Species Evaluation

Level of Value	Receptor	Location	Rationale
Local	Bird assemblage	Quarry site and immediate surrounding area	Protected under the Wildlife Act 1976 as amended by the Wildlife (Amendment) Act 2000 Potential breeding site for a number of common and widespread bird species but is unlikely to be important for any particular species or population but does support some notable species e.g. peregrine which are likely to be somewhat reliant on the exposed rock habitat within the quarry site.
Within the zone of immediate influence only	Bats	Quarry site and immediate surrounding area	Protected under the Wildlife Act 1976 as amended by the Wildlife (Amendment) Act 2000 and the European Communities (Natural Habitats) Regulations 1997 (as amended). Site offering negligible bat roosting opportunities. Site offering potential foraging habitat but unlikely to be vital for any particular species of bat and not likely to be important or critical for local bat populations given the availability of alternative habitat in the wider surrounding area.
	Irish Hare	Quarry site and immediate surrounding area	Protected under the Wildlife Act 1976 as amended by the Wildlife (Amendment) Act 2000 Fairly common species in Ireland. Present within the quarry site and likely throughout the wider surrounding area. The site is unlikely to be important or critical for this species given the availability of high quality habitat for this species in the wider surrounding area.
	Other mammal species	Quarry site and immediate surrounding area	Potential for the site to support a range of small mammals but is unlikely to be important for any particular species or population.

FLORA AND FAUNA 4

Level of Value	Receptor	Location	Rationale
	Reptiles	Quarry site and immediate surrounding area	Protected under the Wildlife Act 1976 as amended by the Wildlife (Amendment) Act 2000. Grassland and scrub habitats provide potential habitat for common lizard however, the lack of any evidence during the habitat surveys would suggest this species if present has a low population size at this site.
	Amphibians	Quarry site and immediate surrounding area	Protected under the Wildlife Act 1976 as amended by the Wildlife (Amendment) Act 2000. Potential breeding and terrestrial habitat for both common frog and smooth newt but is unlikely to be vital or critical for these species.
	Invertebrates	Development site and immediate surrounding area	The site provides potential habitat for a range of invertebrates but is unlikely to be important or critical to any particular species or taxonomic group.

Value of Whole Site

- 4.75 Huntstown Quarry does not have any statutory designations and no such sites lie within a 2km radius of the quarry site.
- 4.76 The quarry site covers a large area of land that supports a wide range of semi-natural and anthropogenic habitats most of which have low overall ecological value except for areas of dry calcareous and neutral grassland, that typically support a good diversity of species and hedgerows most of which are species poor but fundamentally are a resource with ecological value. Based on the size of the site, the habitats present and the known and potential species that it supports it is considered that Huntstown Quarry at least "Local" value with component calcareous grassland of up to "District" value.

Summary of Ecological Receptors for Impact Assessment

- 4.77 In accordance with IEEM guidelines, where receptors have been evaluated at a value of "within the zone of immediate influence only" no further assessment is deemed necessary as the impact on these receptors is not likely to be of significance. However, it should be noted that mitigation measures may still be required to ensure protection of receptors to comply with current wildlife legislation and best practice guidelines (i.e. breeding birds).
- 4.78 The following valuable ecological receptors have been identified with the potential to be affected by the continuation of quarrying and associated

operations at Huntstown Quarry and carried forward for further ecological impact assessment:

- Habitats:
 - dry calcareous and neutral grassland (GS1); and
 - hedgerows (WL1)..
- Species:
 - birds.

POTENTIAL IMPACTS

- 4.79 This section provides a summary of the potential ecological impacts from the continuation of quarrying operations at Huntstown Quarry, based on the baseline information identified from the preliminary desk-based study, baseline surveys and evaluation of the ecological features. Both qualitative and quantitative information has been used to identify likely significant ecological impacts, including the positive, negative, direct, indirect and the cumulative environmental effects.
- 4.80 To assess the effects of a proposed development it is essential that the impacts that could arise are identified and characterised. The ranges of impacts that require consideration in the EclA are based upon knowledge of the proposed development and of the VERs. This can only be undertaken with a thorough understanding of ecological processes and how flora and fauna react to the range of impacts that could occur.

Development Overview

- 4.81 A detailed description of the proposed development is presented in Chapter 2 of the EIS, but in summary the development would basically involve the continuation of quarrying operations and associated facilities at Huntstown Quarry.

Identification of Potential Impacts

- 4.82 The continuation of quarrying and associated operations at Huntstown Quarry will be carried out in accordance with existing practices. The main activities associated with the application for the continuance of quarrying operations will not be significantly different to current activities until the proposed cessation of quarrying operations and restoration of this site in the long-term.
- 4.83 An overall site restoration plan for the site was previously submitted to Fingal County Council in 2003, as part of the previous planning application for continuance of use at the site (P. Ref. No. F03A/1430). Condition No. 19 of this planning permission stated:

'The applicant shall submit details for the written approval of the Planning Department, a scheme of restoration of each extraction area, three years prior to the cessation of quarrying operations in that particular extraction area. The scheme shall include the detailed restoration of the land for the purposes of agriculture, recreation or other such appropriate purposes, the

making safe of the worked out extraction area and the removal of all plant and structures from it, together with a programme for implementation. This restoration scheme shall be prepared in consultation with the Parks Division, Aer Rianta, Dublin Airport Bird Hazard Committee and the Irish Aviation Authority’.

- 4.84 As part of this current planning application and accompanying EIS, an overall site restoration plan is provided in Chapter 2 and Planning Drawings PL06 and PL07. At this current time there are no proposals that would significantly alter the agreed restoration plan, therefore it is considered not necessary to assess the potential impacts arising from the restoration activities on this site post the infilling of this quarry void. The restoration plan will continue to take into account positive gains for wildlife at this site post quarrying operations.

Assessment of Effects

- 4.85 The following section details the assessment of predicted effects on habitats and species from the continuation of quarrying and associated operations at Huntstown Quarry and the ultimate restoration of the quarry site.
- 4.86 Potentially significant impacts that may arise from the continuation of quarrying operations include:
- habitat loss and fragmentation through land-take;
 - effects of habitat loss and fragmentation upon species of fauna;
 - disturbance from human activity noise and vibration,
 - dust deposition;
 - alteration to surface water flows and quality; and
 - restoration of the quarry.
- 4.87 The effects that these potential impacts may have on habitats and species are discussed below.

Habitat Loss and Fragmentation through Land-take

- 4.88 Habitat loss involves the direct destruction or physical take-up of vegetation, or the removal of other structures with conservation interest. Habitat loss may also occur indirectly as a result of a change in land-use or water management, for instance the drying-up of ponds or through induced successional events leading to a change in habitat type.
- 4.89 Habitat fragmentation is concerned with spatial processes, such as negative edge effects (e.g. colonisation by ‘aggressive’ species or successional changes) and dispersal problems that can become increasingly severe as habitat is lost and remaining habitat is divided into smaller units.
- 4.90 Fragmented habitats are likely to be more vulnerable to external factors that may have a negative effect upon them; e.g. disturbance, and may be less resilient to change, including climate and management change; than connected habitats because colonising species may be unable to reach the habitat to re-colonise in the event of species loss.

Dry Calcareous and Neutral Grassland

- 4.91 The majority of the high value dry calcareous and neutral grasslands are outside the main extraction areas and no significant direct losses or further fragmentation of this habitat type is predicted through the continuation of quarrying operations.

Hedgerows

- 4.92 The remaining hedgerows on the site lie outside the main extraction areas and no significant direct loss or further fragmentation of this habitat type is predicted through the continuation of quarrying operations.

Effects of Habitat Loss and Fragmentation upon Species of Fauna

- 4.93 Habitat loss and fragmentation can have a direct impact on individual populations and assemblages of species result in the direct loss of individuals or populations of animal species, or indirectly by increasing levels of stress placed upon populations of some species through negative edge effects (e.g. predation pressure) and dispersal problems that can become increasingly severe as habitat lost and remaining habitat is divided into smaller units.
- 4.94 The extension in the life of the existing quarry will lead to a delay of the delivery of the restored landform. As this is of habitats that do not yet exist and is not required to ensure the survival of any ecosystems and species assemblages and populations its late delivery is unlikely to have a significant impact upon local populations of fauna.

Birds

- 4.95 Survey work undertaken at Huntstown Quarry would indicate that there has not been any significant alteration in the assemblages of species or on the overall populations of birds present and using Huntstown Quarry as a result of existing quarrying operations. It is considered that the continuation of quarrying operations at this site will not have a significant impact on any individual population of bird species or on the overall bird assemblage at this site.
- 4.96 The continuation of quarrying on the site will not cause significant habitat fragmentation to and from the surrounding countryside.

Disturbance from Human Activity, Noise and Vibration

- 4.97 Increases in disturbance, as a result of human activity can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing.
- 4.98 There will be no increase in the overall levels of disturbance experiences at the Huntstown Quarry as a result of continuing quarrying operations. Given that the species that are already present within the quarry site and

surrounding areas will be accustomed to the noise and human activity already generated from the operation of the site, no significant impact is predicted on the species, including birds, which are currently present at or in close proximity to the application site.

Dust Deposition

- 4.99 The extraction and processing of rock, traffic movements and other associated works has the potential to generate dust.
- 4.100 The deposition of dust can have adverse effects upon vegetation restricting photosynthesis, respiration and transpiration. Furthermore it can lead to phytotoxic gaseous pollutants penetrating the plants. The overall effect can be a decline in plant productivity, which may then have indirect effects on the quality of the affected habitats and associated fauna.
- 4.101 The levels at which dust deposition is considered likely to affect the most sensitive species or ecosystems is considered to be 1000 mg/m²/day¹⁰.
- 4.102 It is considered that the dust mitigation measures currently in place actively control the amount of dust that actually leaves the site. The air quality assessment, presented in Chapter 8 of the EIS, would indicate that provided industry standard dust mitigation measures are employed at the site during construction it is highly unlikely that these dust deposition levels will exceed 350 mg/m²/day far below where it would be expected to have an effect on sensitive ecological receptors.
- 4.103 The habitats present in quarry and surrounding area has been subjected to the long-term effects of dust with no perceivable negative effects upon flora and fauna resulting from dust deposition identified. The continuation of quarrying operations is unlikely to significantly increase the rate or levels of dust deposition and no significant impact is predicted on any habitats or species of flora within the immediate surrounding area.

Alterations to Surface Water Flows and Quality

- 4.104 The existing infrastructure in place at Huntstown Quarry includes systems to manage surface water drainage and pollution and these systems will continue to operate during the continuation of quarrying operations. This is described in more detail in Chapter 6 of the EIS.
- 4.105 The continuation of quarrying operations is not anticipated to cause any significant changes to the groundwater or surface water regimes that would have a significant negative effect upon habitats or species within the quarry site.

¹⁰ Highways Agency (2007). Design Manual for Roads and Bridges Volume 11, Section 3, Part 1 HA207/7 Air Quality. Highways Agency.

Restoration of the Quarry

- 4.106 The restoration of the quarry will be based upon a phased approach with small areas of the quarry anticipated to be provided for some restoration works during quarrying operations.
- 4.107 Upon the cessation of quarrying operations the site would be fully restored primarily to agricultural land with the main areas of ecological interest remaining as wildlife areas. Through careful design and restoration techniques there is the opportunity to create a range of habitats and for habitats to develop through natural regeneration and enhancement including native woodland and hedgerow planting and potential to leave some areas exposed rock faces providing opportunities for a range of individual and groups of species.

Cumulative Impacts

- 4.108 There are no other known activities or proposed activities at or within close proximity to the application site that would be likely to result in any significant cumulative impacts on the ecology of local area at this current time. It is therefore considered that no significant cumulative impacts would occur.

MITIGATION, ENHANCEMENT AND COMPENSATION

- 4.109 Due to the fact that the proposed development is for a continuation of quarrying and associated operations only, and providing all existing measures and controls relating to this site are maintained, no additional mitigation measures to those already in place at the site are proposed or deemed necessary.

Monitoring

- 4.110 Areas of high ecological value and those currently managed for wildlife will continue to be monitored on a regular basis to determine whether the continuation of quarrying is having negative effects and to ensure appropriate management of these areas is undertaken to maintain their biological interest.

SUMMARY AND CONCLUSIONS

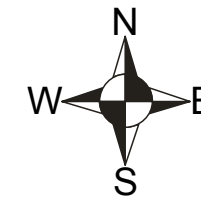
- 4.111 The continuation of quarrying and associated operations at Huntstown Quarry will not require any further taking of land outside the already active permitted operational areas and as such is unlikely to have significant ecological impact on the existing baseline ecological conditions within the application site, or on the wider surrounding area, over and above the impacts already experienced both temporally or spatially from the operations of the quarry.
- 4.112 It is considered that there are no legal or policy implications from the proposal for the continuation of quarrying operations at Huntstown Quarry.

Figures

- Figure 4-1 Habitat Plan – North Quarry
- Figure 4-2 Habitat Plan – Western Quarry
- Figure 4-3 Habitat Plan – Central Quarry
- Figure 4-4 Habitat Plan – South Quarry

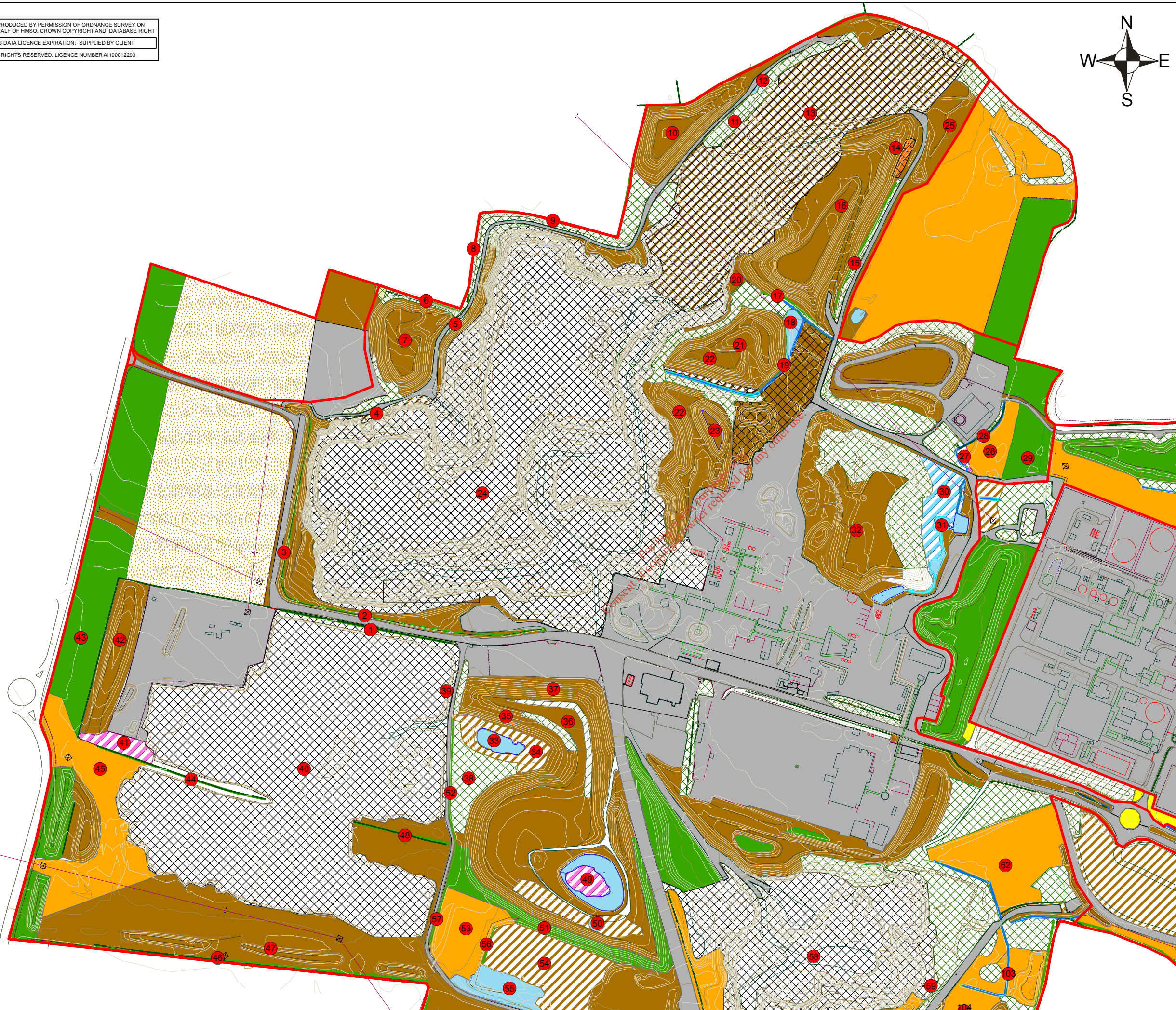
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LEGEND

- APPLICATION SITE
- 1 TARGET NOTE
- BROADLEAVED WOODLAND
- MIXED BROADLEAVED/ CONIFER WOODLAND
- SCRUB
- IMMATURE WOODLAND
- IMPROVED GRASSLAND
- AMENITY GRASSLAND (IMPROVED)
- DRY CALCAREOUS & NEUTRAL GRASSLAND
- DRY MEADOWS & GRASSY VERGES
- WET GRASSLAND
- MARSH
- OTHER ARTIFICIAL LAKES & PONDS
- JAPANESE KNOTWEED
- REED & LARGE SEDGE SWAMPS
- TALL HERB SWAMPS
- SPOIL & BARE GROUND
- RECOLONISING BARE GROUND
- ACTIVE QUARRIES & MINES/ EXPOSED CALCAREOUS ROCK
- ARABLE CROPS
- BUILDINGS & ARTIFICIAL SURFACES
- DRAINAGE DITCH
- HEDGEROWS



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HUNSTOWN QUARRY
 CONTINUANCE OF QUARRYING
 OPERATIONS
HABITAT PLAN - NORTH QUARRY

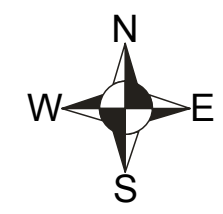
Figure 4.1

Scale 1:4,250 @ A3

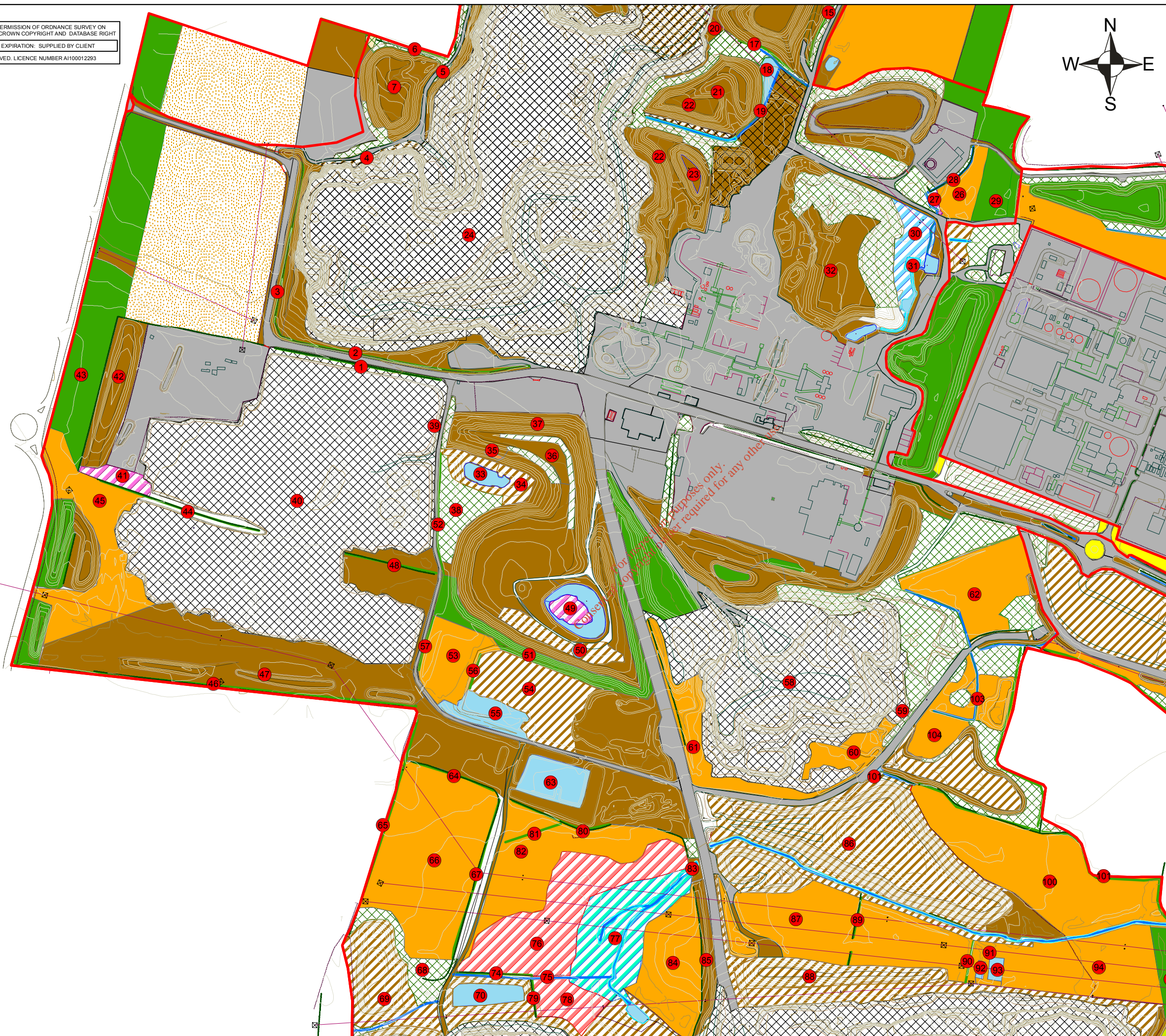
Date JULY 2011

2036.0115.10.Fig4-1.0 Habitat Plan - North Quarry

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LEGEND	
	APPLICATION SITE
	TARGET NOTE
	BROADLEAVED WOODLAND
	MIXED BROADLEAVED/ CONIFER WOODLAND
	SCRUB
	IMMATURE WOODLAND
	IMPROVED GRASSLAND
	AMENITY GRASSLAND (IMPROVED)
	DRY CALCAREOUS & NEUTRAL GRASSLAND
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	WET GRASSLAND
	MARSH
	OTHER ARTIFICIAL LAKES & PONDS
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	REED & LARGE SEDGE SWAMPS
	TALL HERB SWAMPS
	SPOIL & BARE GROUND
	RECOLONISING BARE GROUND
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	ARABLE CROPS
	BUILDINGS & ARTIFICIAL SURFACES
	DRAINAGE DITCH
	HEDGEROWS



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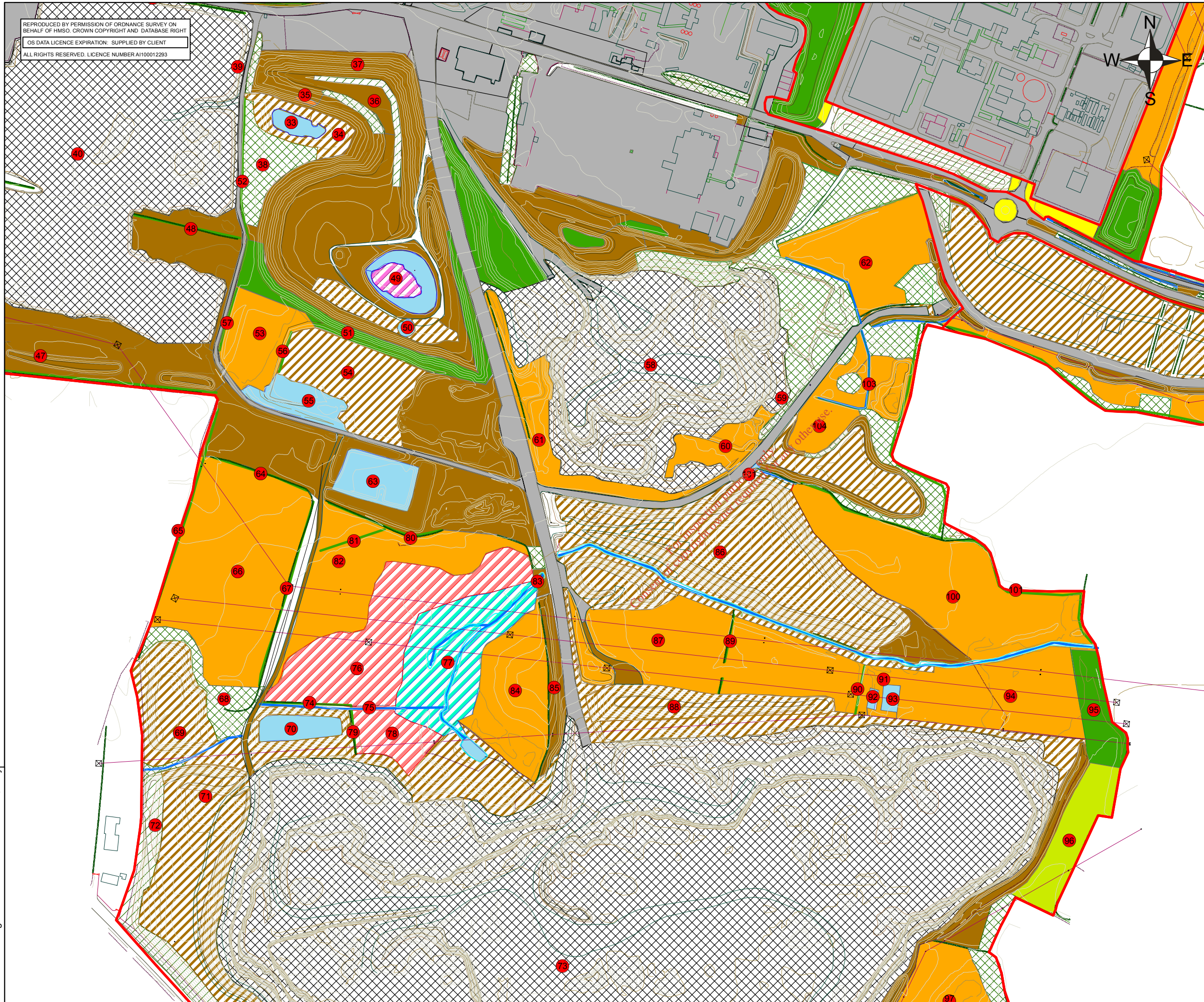
HUNSTOWN QUARRY
 CONTINUANCE OF QUARRYING
 OPERATIONS
HABITAT PLAN - WESTERN QUARRY

Figure 4.2

Scale 1:4,500 @ A3 Date JULY 2011

2036.0115.10.Fig4-2.0 Habitat Plan - Western Quarry

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LEGEND	
	APPLICATION SITE
	TARGET NOTE
	BROADLEAVED WOODLAND
	MIXED BROADLEAVED/ CONIFER WOODLAND
	SCRUB
	IMMATURE WOODLAND
	IMPROVED GRASSLAND
	AMENITY GRASSLAND (IMPROVED)
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	RECOLONISING BARE GROUND
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	BUILDINGS & ARTIFICIAL SURFACES
	DRAINAGE DITCH
	HEDGEROWS

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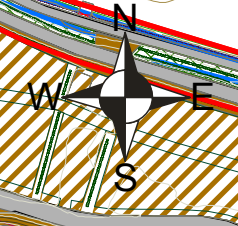
HUNSTOWN QUARRY
 CONTINUANCE OF QUARRYING
 OPERATIONS
HABITAT PLAN - CENTRAL QUARRY

Figure 4.3

Scale 1:3,750 @ A3 Date JULY 2011

2036.0115.10.Fig4-3.0 Habitat Plan - Central Quarry

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LEGEND	
	APPLICATION SITE
	TARGET NOTE
	BROADLEAVED WOODLAND
	MIXED BROADLEAVED/ CONIFER WOODLAND
	SCRUB
	IMMATURE WOODLAND
	IMPROVED GRASSLAND
	AMENITY GRASSLAND (IMPROVED)
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	DRY MEADOWS & GRASSY VERGES
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	MARSH
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	TALL HERB SWAMPS
	SPOIL & BARE GROUND
	RECOLONISING BARE GROUND
	ACTIVE QUARRIES & MINES/ EXPOSED CALCAREOUS ROCK
	ARABLE CROPS
	BUILDINGS & ARTIFICIAL SURFACES
	DRAINAGE DITCH
	HEDGEROWS

2036.0115.10.Fig4-4.0 Habitat Plan - South Quarry

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HUNSTOWN QUARRY
 CONTINUANCE OF QUARRYING
 OPERATIONS
HABITAT PLAN - SOUTH QUARRY

Figure 4.4

Scale 1:4,000 @ A3 Date JULY 2011

Appendix 4-A

Target Notes

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TARGET NOTES

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NORTH QUARRY

Target Note	Description
<p data-bbox="456 407 505 428">TN1</p> 	<p data-bbox="695 407 1430 548">A species-poor unmanaged 5m high hedgerow dominated by common hawthorn (<i>Crataegus monogyna</i>) with some semi-mature ash (<i>Fraxinus excelsior</i>) and sycamore (<i>Acer pseudoplatanus</i>). Most of the ash trees are showing signs of severe stress with noticeable die- back in the canopy.</p> <p data-bbox="695 556 1430 611">Associated with the hedgerow are a narrow and shallow ditch and a 1m wide strip of grassland forming the roadside verge.</p> <p data-bbox="695 619 1430 785">The ditch has a mean channel width of 0.5m at normal water level and banks up to 1.5m in height at an angle of 45°. The ditch was dry at the time of the survey and was found not to support any aquatic or marginal vegetation. Its banks were typically dominated by ivy (<i>Hedera helix</i>) that extended up most of the trunks of the trees in the hedgerow.</p> <p data-bbox="695 793 1430 1161">The 1m wide verge supports rank species-poor neutral grassland that shows evidence of some disturbance with a sward comprised of false oat-grass (<i>Arrhenatherum elatius</i>), cock's-foot (<i>Dactylis glomerata</i>), Yorkshire-fog (<i>Holcus lanatus</i>) and Italian rye-grass (<i>Lolium multiflorum</i>). The herb component consists of creeping thistle (<i>Cirsium arvense</i>), hogweed (<i>Heracleum sphondylium</i>); meadow vetchling (<i>Lathyrus pratensis</i>), ribwort plantain (<i>Plantago lanceolata</i>), creeping buttercup (<i>Ranunculus repens</i>); bramble (<i>Rubus fruticosus</i> agg.) common ragwort (<i>Senecio jacobaea</i>), red clover (<i>Trifolium pratense</i>), white clover (<i>Trifolium repens</i>), colt's-foot (<i>Tussilago farfara</i>) and germander speedwell (<i>Veronica chamaedrys</i>) as well as a solitary spike of pyramidal orchid (<i>Anacamptis pyramidalis</i>).</p>
<p data-bbox="456 1178 505 1199">TN2</p> 	<p data-bbox="695 1178 1430 1232">A species-poor 3m high hedgerow dominated by beech (<i>Fagus sylvatica</i>) with some sycamore also present.</p> <p data-bbox="695 1241 1430 1518">Associated with the hedgerow is a 2m wide roadside verge with a rank sward dominated by false oat-grass with cock's-foot Yorkshire-fog and rough meadow-grass (<i>Poa trivialis</i>) also present. The species-poor herb component includes creeping thistle, hogweed, meadow vetchling, autumn hawkbit (<i>Leontodon autumnalis</i>), ribwort plantain, creeping cinquefoil (<i>Potentilla reptans</i>), bramble, broad-leaved dock (<i>Rumex obtusifolius</i>), common ragwort, dandelion (<i>Taraxacum officinale</i> agg.), white clover, common nettle (<i>Urtica dioica</i>), tufted vetch (<i>Vicia cracca</i>) and bush vetch (<i>Vicia sepium</i>).</p>
<p data-bbox="456 1539 505 1560">TN3</p> 	<p data-bbox="695 1539 1430 1619">A 2m high hawthorn dominated hedgerow and associated verge that is similar in species composition to the verge describe in TN2 but covers a bank that rises up to 3m in height.</p>




APPENDIX 4-A

Target Note	Description
<p>TN4</p> 	<p>A 1m high bund supporting vegetation associated with recolonising bare ground but developing into a neutral grassland community. Colt's-foot is locally frequent but the grasses of false oat-grass, cock's-foot and Yorkshire-fog are beginning to form a conspicuous component of the vegetation. Other herbs present include creeping thistle, broad-leaved dock, common ragwort, red clover and common nettle. Some scrub development is evident including some shrubs of common hawthorn and elder as well as small patches of bramble.</p>
<p>TN5</p> 	<p>Small patch of dense scrub consisting of semi-mature sycamore with some common hawthorn, hazel (<i>Corylus avellana</i>) and dense bramble.</p>
<p>TN6 No Photograph Available</p>	<p>A 6m high unmanaged hedgerow running along the part of the boundary of quarry and development site dominated by semi-mature sycamore and ash (<i>Fraxinus excelsior</i>) that expands out into a narrow scrub belt that includes some goat willow (<i>Salix caprea</i>).</p> <p>Associated with the hedgerow is a narrow and shallow drainage ditch that is generally heavily shaded by bankside trees and shrubs that excludes the presence of aquatic and marginal vegetation.</p>
<p>TN7</p> 	<p>Large spoil mound located on the western side of the development site dominated by rank neutral grassland with some scattered scrub across that mound but which becomes more frequent and dense along its lower slopes.</p> <p>The sward is dominated by false oat-grass with cock's-foot, red fescue (<i>Festuca rubra</i> agg.) and Yorkshire-fog with glaucous sedge (<i>Carex flacca</i>), common sedge (<i>Carex nigra</i>), compact rush (<i>Juncus conglomeratus</i>) and hard rush (<i>Juncus inflexus</i>) present in damper areas.</p> <p>The herbs component of the sward include rosebay willowherb (<i>Chamerion angustifolium</i>), creeping thistle, hogweed, autumn hawkbit, black medick (<i>Medicago lupulina</i>), ribwort plantain, creeping cinquefoil, cowslip (<i>Primula veris</i>), selfheal (<i>Prunella vulgaris</i>), common comfrey (<i>Symphytum officinale</i>), red clover, white clover and colt's-foot. Other species present in the sward include field horsetail (<i>Equisetum arvense</i>) and the moss <i>Calliegron cuspidatum</i>.</p> <p>Scrub encroachment from sycamore, ash, common hawthorn, goat willow, elder and bramble is evident across the mound that forms dense scrub patches particularly on the lower slopes of the western side of the mound.</p>





APPENDIX 4-A

Target Note	Description
<p data-bbox="456 275 505 296">TN8</p> 	<p data-bbox="695 275 1425 415">An 8m high hedgerow running along part of the boundary of the quarry and development site dominated by semi-mature sycamore but with frequent elder and some semi-mature ash also present. Patches of bramble and elder extend out from the hedgerow to form a dense scrub belt.</p>
<p data-bbox="456 590 505 611">TN9</p> 	<p data-bbox="695 590 1425 751">A 5m hedgerow running along part of the boundary of the quarry and development site dominated by semi-mature ash with some sycamore (semi-mature), common hawthorn, blackthorn (<i>Prunus spinosa</i>), elder and bramble also present that extends out to form a dense scrub belt that gradually widens towards its northern extent.</p>
<p data-bbox="451 905 509 926">TN10</p>  	<p data-bbox="695 905 1425 961">Large bund/spoil mound 10-15m high supporting rank neutral grassland with some scrub development.</p> <p data-bbox="695 963 1425 1052">The grassland sward is dominated by false oat-grass with frequent common couch (<i>Elytrigia repens</i>) and some rough meadow grass.</p> <p data-bbox="695 1054 1425 1283">The herb component that never forms a conspicuous component of the sward, with the exception of locally frequent creeping thistle, includes rosebay willowherb, spear thistle (<i>Cirsium vulgare</i>), wild carrot (<i>Daucus carota</i>), great willowherb (<i>Epilobium hirsutum</i>), meadow vetchling, ribwort plantain, creeping cinquefoil, broad-leaved dock, common ragwort, bladder campion (<i>Silene vulgaris</i>), dandelion, red clover, white clover, colt's-foot, common nettle as well as field horsetail.</p> <p data-bbox="695 1285 1425 1373">Some encroachment of scrub is evident including isolated shrubs of sycamore, ash and goat willow as well as small patches of bramble.</p>
<p data-bbox="451 1526 509 1547">TN11</p> 	<p data-bbox="695 1526 1425 1724">A shallow depression formed at the base of a large mound in the northern part of the development site that supports an inundation type community that is in the early stages of developing into a small patch of reed swamp. Wetland species of flora present include a small stand of reedmace (<i>Typha latifolia</i>) along with creeping bent (<i>Agrostis stolonifera</i>), compact rush, hard rush and creeping buttercup (<i>Ranunculus repens</i>).</p>






APPENDIX 4-A

Target Note	Description
<p>TN12</p> 	<p>A spoil mound/bund located in the northern part of the development site that rises up 20m before levelling out and dropping a few metres to an area of restored quarry. The mound supports scattered scrub consisting of occasional butterfly-bush (<i>Buddleja davidii</i>) and some common hawthorn. The understory consists of recolonising bare ground habitat dominated by colt's-foot with frequent Yorkshire-fog. Other species present include rosebay willowherb, creeping thistle, meadow vetchling, selfheal, common ragwort and white clover.</p>
<p>TN13</p> 	<p>An area of restored quarry that supports recolonising bare ground habitat. The typically sparse vegetation includes a good diversity of species including the graminoid species of creeping bent, Yorkshire-fog, red fescue, Italian rye-grass, hard rush and the herbaceous species of yarrow (<i>Achillea millefolium</i>), rosebay willowherb, creeping thistle, spear thistle, broad-leaved willowherb (<i>Epilobium montanum</i>), cleavers (<i>Galium aparine</i>), pineappleweed (<i>Matricaria discoidea</i>), black medick, ribbed melick (<i>Melilotus officinalis</i>), common poppy (<i>Papaver rhoeas</i>), greater plantain (<i>Plantago major</i>), knotgrass (<i>Polygonum aviculare</i>), redshank (<i>Polygonum persicaria</i>), silverweed (<i>Potentilla anserina</i>), creeping buttercup, wild radish (<i>Raphanus raphanistrum</i>), broad-leaved dock, hedge mustard (<i>Sisymbrium officinale</i>), prickly sow thistle (<i>Sonchus asper</i>), common chickweed (<i>Stellaria media</i>), dandelion, red clover, white clover, scentless mayweed (<i>Tripleurospermum inodorum</i>) and colt's-foot.</p>
<p>TN14 No Photograph Available</p>	<p>A stand of Japanese knotweed (<i>Fallopia japonica</i>) that is a non-native invasive species.</p>
<p>TN15</p> 	<p>A remnant hedgerow dominated by common hawthorn that has extended out to form a narrow scrub belt. Other woody species present include frequent elder and some butterfly-bush.</p>
<p>TN16 No Photograph Available</p>	<p>A large soil mound similar to TN10 but with the habitats much less developed. Dense scrub consisting of sycamore, common hawthorn, ash, blackthorn and elder becomes more prominent on the lower slopes of the mound particularly on its southwesterly edge.</p>
<p>TN17 No Photograph Available</p>	<p>A tall remnant hedgerow dominated by semi-mature ash.</p>





APPENDIX 4-A

Target Note	Description
<p>TN18</p> 	<p>Small marshy area adjacent to a drainage ditch typically dominated by tall herbs. Species present include the graminoid species of tufted hair-grass (<i>Deschampsia cespitosa</i>), Yorkshire-fog, rough meadow-grass, soft rush and scattered small stands of reedmace. The herb species include spear thistle, great willowherb, hemp-agrimony (<i>Eupatorium cannabinum</i>), hogweed, meadow buttercup (<i>Ranunculus acris</i>), broad-leaved dock, common ragwort, red clover and common nettle.</p>
<p>TN19</p> 	<p>A drainage ditch flowing in an easterly direction with a mean channel width of 1.5m at normal water level and banks up to 2m in height at an angle of 45°. At the time of the survey most of the lengths of the watercourse were dry exposing a substrate consisting of mud and silt.</p> <p>Vegetation was typically sparse but where present included emergent water plantain (<i>Alisma plantago-aquatica</i>), jointed rush (<i>Juncus articulatus</i>), water forget-me-not (<i>Myostis scorpioides</i>), branched bur-reed (<i>Sparganium erectum</i>), reedmace and submerged fennel pondweed (<i>Potamogeton pectinatus</i>). Also along the marginal zone were creeping bent, soft rush (<i>Juncus effusus</i>) and hard rush.</p> <p>The banks are largely dominated by scrub and tall ruderal vegetation except along the lower section of the right bank that supports a number of wetland species as described in TN18.</p>
<p>TN20</p> 	<p>A small area of grassland with some affinities to a calcareous grassland habitat-type extending along the top of the quarry lip. The grassland has a short sward, maintained by rabbit grazing, that includes the grasses of red fescue and Yorkshire-fog but which never have overall prominence. The herb species include daisy (<i>Bellis perennis</i>), common centaury (<i>Centaurium erythraea</i>), common cat's-ear (<i>Hypochaeris radicata</i>) field scabious (<i>Knautia arvensis</i>), common bird's-foot-trefoil (<i>Lotus corniculatus</i>), mouse-ear hawkweed (<i>Pilosella officinarum</i>), ribwort plantain, colt's-foot and some bramble. The grassland also supports a good population of common spotted orchid (<i>Dactylorhiza fuchsia</i>) (white flowered plants only) and pyramidal orchid with 39 and 55 individual spikes counted respectively in 2010</p>
<p>TN21</p> 	<p>A small area of swamp vegetation formed in a shallow depression on top of a large soil mound dominated by reedmace and rushes that include frequent jointed rush as well as soft rush and common spike-rush (<i>Eleocharis palustris</i>).</p>


APPENDIX 4-A

Target Note	Description
<p>TN22</p> 	<p>A relatively extensive area of very high spoil mounds supporting a mosaic of rank neutral grassland, scrub and recolonising bare ground vegetation with similar species composition as for TN10 but more established.</p> <p>Dissecting the soil mounds is a drainage ditch (TN19) and associated maintenance berms dominated by tall ruderal vegetation dominated by creeping thistle but with lesser burdock (<i>Arctium minus</i>), spear thistle, rosebay willowherb, great willowherb, wild mignonette (<i>Reseda lutea</i>) and common ragwort forming a conspicuous strip of vegetation</p>
<p>TN23</p> 	<p>A small deep pond formed within a steep sided depression on a large soil mound. The southern shallower part of the pond supports a dense stand of reedmace that also forms a narrow fringe of vegetation around the rest of the pond along with some hard rush. The only other aquatic species recorded was common duckweed (<i>Lemna minor</i>) forming small floating clumps of vegetation in amongst the reedmace.</p> <p>The steeply sloping banks are dominated by scrub consisting predominantly of common hawthorn and goat willow.</p> <p>Male and female smooth newts were observed at the pond in 2011.</p>
<p>TN24</p> 	<p>A large quarry void with some standing water on the quarry floor. The quarry floor and walls are typically devoid of vegetation although some male fern (<i>Dryopteris filix-mas</i>) and hart's-tongue (<i>Phyllitis scolopendrium</i>) have colonised certain areas of the upper quarry faces.</p>
<p>TN25</p> 	<p>A horse grazed pasture with a low tight sward consisting of sweet vernal-grass (<i>Anthoxanthum odoratum</i>), red fescue, Yorkshire-fog and some perennial rye-grass (<i>Lolium perenne</i>). Herbs form a conspicuous component of the sward including daisy, creeping thistle, selfheal (<i>Prunella vulgaris</i>), meadow buttercup, creeping buttercup, broad-leaved dock, common ragwort, red clover and white clover.</p>
<p>TN26</p> 	<p>A damp horse grazed pasture with a sward dominated by Yorkshire-fog and creeping buttercup. Other species present include daisy, spear thistle and some hard rush.</p>


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Target Note	Description
<p data-bbox="451 275 513 300">TN27</p> 	<p data-bbox="695 275 1430 420">A small patch of marsh lying in a low area adjacent to a ditch that supports a number of wetland species including creeping bent, jointed rush, soft rush, common fleabane (<i>Pulicaria dysenterica</i>), curled dock (<i>Rumex crispus</i>), reedmace and blue water-speedwell (<i>Veronica anagalis-aquatica</i>).</p>
<p data-bbox="451 596 513 621">TN28</p> 	<p data-bbox="695 596 1430 682">A section of shallow drainage ditch that for much of its length is heavily shaded but where open supports water plantain, branched bur-reed and reedmace.</p>
<p data-bbox="451 917 513 942">TN29</p> 	<p data-bbox="695 917 1430 982">Broadleaved woodland plantation dominated by ash with some sycamore also present.</p>
<p data-bbox="451 1247 513 1272">TN30</p> 	<p data-bbox="695 1247 1430 1392">An area of tall herb swamp dominated by stands of reedmace that forms a transition to marsh dominated by soft rush in a low-lying area adjacent a drainage ditch. Other species present include great willowherb, meadowsweet (<i>Filipendula ulmaria</i>), common fleabane and silverweed.</p>





APPENDIX 4-A

Target Note	Description
<p>TN31</p> 	<p>A series of four ponds connected by short sections of ditch that receive surface water run-off from the concrete processing facility and as a result the water receives high quantities of calcium carbonates that discolour the water in all but the last pond. Most of the water is then recycled back to the concrete batching plant. The ponds are devoid of aquatic vegetation except for some small emergent stands of greater pond-sedge (<i>Carex riparia</i>) and reedmace with soft rush, hard rush, great willowherb and goat willow growing around the margins of the ponds.</p>
<p>TN32</p> <p>No photograph available</p>	<p>Spoil mound that is similar to TN22 with extensive areas of hawthorn and goat willow dominated scrub along its northern and eastern edges.</p>




WESTERN QUARRY AND ECOLOGICAL MOUND

Target Note	Description
<p>TN33</p> 	<p>Shallow pond subject to near complete drawdown in 2011 with submerged rigid hornwort (<i>Ceratophyllum demersum</i>) and a stand of emergent reedmace on its western margins with some common spike-rush (<i>Eleocharis palustris</i>) and hard rush present around its margins.</p>






APPENDIX 4-A

Target Note	Description
<p>TN34</p> 	<p>Perennial/short ephemeral vegetation with some willow scrub development consisting of goat willow. Colt's-foot is abundant with frequent black medick with common centuary, common ragwort, selfheal, silverweed, yarrow, cat's-ear, ribbed melick, bristly oxtongue, velvet bent (<i>Agrostis canina</i>), creeping thistle, field forget-me-not, creeping cinquefoil, daisy, Yorkshire-fog, perforate St John's-wort (<i>Hypericum perforatum</i>), common eyebright (<i>Euphrasia nemorosa agg.</i>), wild carrot, yellow wort (<i>Blackstonia perfoliata</i>), sheep's fescue and teasel.</p> <p>The vegetation becomes more development up the northern and western slopes gradually forming a transition zone to rank grassland with creeping cinquefoil, colt's-foot, white clover, ribwort plantain, common nettle, cock's-foot, false oat-grass, bramble and dog-rose forming the main components of this vegetation.</p>
<p>TN35</p> 	<p>Stand of Japanese knotweed that extends along part of bank running rising to the north of the TN33.</p>
<p>TN36</p> 	<p>A rank grassland with a sward dominated by false oat-grass with cock's-foot, sweet vernal grass, rough meadow-grass, Yorkshire-fog, red fescue, tufted hair-grass, timothy. Herb component includes creeping thistle, ribwort plantain, black knapweed, wild carrot, silverweed, lesser stitchwort, red clover, greater bindweed, common ragwort, hogweed, selfheal, black medick, broad-leaved dock, perforated St John's--wort, rough hawks-beard, hairy sedge, greater bird's-foot-trefoil, tufted vetch, field horsetail, common vetch, meadowsweet, great willowherb, meadow vetchling, silverweed, marsh woundwort and cowslip.</p> <p>Scrub includes bramble, goat willow, elder with some young ash regeneration with a line of young alder on top of the bank on its eastern side</p>
<p>TN37</p> 	<p>A rank grassland with some broadleaved woodland planting consisting of alder on steep bank consisting of species as for TN36 but with some gorse and butterfly-bush also present. On the lower northern facing slope great horsetail (<i>Equisetum telmateia</i>) forms a dense stand of vegetation. Along bottom of the bank hedgerow planting consisting of blackthorn, common hawthorn, alder and dog rose has taken place.</p>





APPENDIX 4-A

Target Note	Description
<p>TN38</p> 	<p>An area of scrub dominated by semi-mature ash with some common hawthorn and goat willow also present.</p>
<p>TN39</p> <p>No photograph available</p>	<p>Remnant section of hedgerow on top of a 1m high earth bank dominated by common hawthorn with blackthorn, dog rose and semi-mature ash. Bramble is locally dominant. Ground and field layers on the bank dominated by ivy with hogweed, teasel, ribwort plantain, colt's-foot, common ragwort, yellow wort (<i>Blackstonia prfoliata</i>), Yorkshire-fog, black knapweed, herb Robert and creeping thistle as well as a solitary pyramidal orchid.</p>
<p>TN40</p> 	<p>The Western Quarry that is an area that has been stripped of topsoil that has left predominantly bare substrates and vertical 1-2m high banks around the edge of the site. Some colonisation by ephemeral/short perennial vegetation including Yorkshire-fog, hard rush, selfheal and colt's-foot has taken place with some common spike-rush, jointed rush and reedmace formed in numerous ephemeral ponds formed in depressions which collect surface water. Where standing water is more permanent rigid hornwort, water horsetail (<i>Equisetum fluviatile</i>) and broad-leaved pondweed (<i>Potamogeton natans</i>) can also be found along with some common cotton-sedge (<i>Eriophorum angustifolium</i>) and glaucous sedge also infrequently present in the northwest corner of the site..</p> <p>Scrub development is evident across the site that includes white willow, goat willow and butterfly-bush</p>
<p>TN41</p> 	<p>Marshy grassland with abundant hard rush and lesser spearwort (<i>Ranunculus flammula</i>) with creeping bent, jointed rush, curled dock, glaucous sedge and soft rush also present</p>



APPENDIX 4-A

Target Note	Description
<p>TN42</p> 	<p>Bund dominated by rank grassland dominated by false oat-grass with Yorkshire-fog and perennial rye-grass, red fescue, creeping bent and timothy, common sedge the other graminoid species present. Herbs include ribwort plantain, creeping thistle, common ragwort, white clover, hogweed, red bartista (<i>Odontites vernus</i>), red clover, common mouse-ear, creeping buttercup, broad-leaved dock.</p> <p>Scrub development is evident and includes bramble, gorse and common hawthorn.</p>
<p>TN43</p> 	<p>Broadleaved plantation woodland comprising mature alder with some ash, willow, mountain ash and larch (<i>Larix decidua</i>). Field flora is dominated by Yorkshire-fog with hogweed, herb Robert, bramble and white clover.</p>
<p>TN44</p> 	<p>Hedgerow consisting of mature and semi-mature ash and mature sycamore</p>
<p>TN45</p> 	<p>Grassland with a tight short sward consisting of creeping bent, Yorkshire-fog, and false oat-grass and perennial rye-grass. Herbs include frequent ribwort plantain, red clover and white clover along with common eyebright, selfheal, creeping thistle, cowslip (<i>Primula veris</i>), autumnal hawkbit, yellow wort, greater bird's-foot-trefoil, red bartista, common ragwort, creeping buttercup, oxeye daisy, common mouse-ear and common centaury (<i>Centaureum erythraea</i>)..</p>
<p>TN46</p> 	<p>Mature ash dominated hedgerow with common hawthorn and dog rose</p>



APPENDIX 4-A

Target Note	Description
<p data-bbox="451 275 513 300">TN47</p> 	<p data-bbox="683 275 1437 474">Bund dominated by rank grassland dominated by false oat-grass with Yorkshire-fog, creeping bent, rough meadow-grass, timothy, common couch and some hard rush. Herbs include silverweed, creeping cinquefoil, ribwort plantain, greater plantain, colt's-foot, hedge woundwort, bramble, selfheal, red clover, white clover, broad-leaved dock, locally abundant creeping thistle and locally frequent creeping buttercup, common nettle and common ragwort.</p>
<p data-bbox="451 590 513 615">TN48</p> 	<p data-bbox="683 590 1437 653">Remnant section of hedgerow dominated by common hawthorn with some ash. Hedgerow showing signs of stress.</p>
<p data-bbox="451 926 513 951">TN49</p> 	<p data-bbox="683 926 1437 1041">Ephemeral pond on top of the ecological mound dominated by reedmace with water plantain, common spike-rush, great willowherb, false fox-sedge (<i>Carex otrubae</i>), soft rush and hard rush also present</p>
<p data-bbox="451 1262 513 1287">TN50</p> 	<p data-bbox="683 1262 1437 1314">Series of four ephemeral ponds on top of the ecological mound supporting stands of reedmace and common spike rush</p>





APPENDIX 4-A

Target Note	Description
<p>TN51</p> 	<p>Broadleaved plantation woodland/scrub consisting of semi-mature ash with silver birch, goat willow and hazel present along the southern edge of the ecological mound.</p> <p>Along bottom of the eastern slope of the ecological mound the trees are younger in age and more diverse consisting of blackthorn, hazel, ash, sycamore, sessile oak (<i>Quercus petraea</i>), silver birch (<i>Betula pendula</i>), poplar, alder, mountain ash, whitebeam (<i>Sorbus intermedia brauewers</i>) and dog rose.</p>
<p>TN52</p> 	<p>Hedgerow with mature and semi-mature ash, hazel,, blackthorn and common hawthorn</p>

CENTRAL QUARRY

Target Note	Description
<p>TN53</p> 	<p>Grassland with a low tight sward consisting of false oat-grass, Yorkshire-fog, rough meadow-grass and red fescue along with hard rush and common sedge. Herbs include burdock, creeping cinquefoil, selfheal, white clover, ribwort plantain, creeping buttercup, creeping thistle, silverweed, hogweed, red clover and some bramble. Further stripping of overburden and topsoil is required from the proposed central quarry footprint prior to the extraction of rock.</p>
<p>TN54</p> 	<p>Disturbed area and spoil mound supporting a mosaic of ephemeral short perennial vegetation and damp grassland. Hard rush, silverweed, spear thistle, colt's-foot, creeping bent, rough meadow-grass, white clover, common centaury, selfheal, great willowherb, sow thistle, meadow vetchling, Yorkshire-fog, tufted vetch, red clover, creeping cinquefoil, common cats-ear, false brome common eyebright and common spotted orchid</p>


APPENDIX 4-A

Target Note	Description
<p>TN55</p> 	<p>A pond formed through the collection of surface water from TN53 that supports branched bur-reed jointed rush, broad-leaved pondweed, common spike-rush, pond water-crowfoot (<i>Ranunculus peltatus</i>), reedmace, water plantain, rigid hornwort, lesser spearwort.</p>
<p>TN56</p> 	<p>Hedgerow dominated by semi-mature ash with some semi-mature sycamore, common hawthorn, elder and bramble</p>
<p>TN57</p> 	<p>Hedgerow with some semi-mature ash along with common hawthorn, blackthorn and bramble</p>
<p>TN58</p> 	<p>Central quarry consisting of areas of bare exposed rock and other areas used for the disposal of waste materials. A large area of open standing water is present in the quarry floor.</p>
<p>TN59</p> <p>No photograph available</p>	<p>Belt of semi-mature ash and common hawthorn</p>





APPENDIX 4-A

Target Note	Description
TN60 	Top of quarry void dominated by rabbit grazed calcareous grassland with a short tight sward consisting of Yorkshire-fog, sweet vernal-grass, red fescue, sheep's fescue and some hard rush. The herbs include black knapweed, cowslip, common bird's-foot-trefoil, common centaury, ribwort plantain as well as good populations of .pyramidal orchid and common spotted orchid with 145 and 127 individual spikes counted in 2010.
TN61 No photograph available	Short grassland similar to TN60 but still developing and without the presence of orchids.
TN62 	Grassland dominated by false oat –grass and sweet vernal grass, with some velvet bent, cock's-foot and crested dog's-tail, Glaucous sedge and common sedge also present. The herb component is relatively sparse with common birds's-foot trefoil, meadow vetchling, cowslip, common eyebright, ribwort plantain, common ragwort, red clover and white clover present. Orchids are a conspicuous component of the sward with 500+, common spotted orchid and 32 pyramidal orchid recorded in 2010.





SOUTH QUARRY

Target Note	Description
TN63 	Surface water attenuation lagoon with a raised bund around its edge. Predominantly bare ground except for some tree planting along the roadside bank.





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Target Note	Description
TN64	Remnant hedgerow consisting of semi-mature ash with common hawthorn, elder and bramble.
	
TN65	Mature ash dominated hedgerow with common hawthorn and dog rose
	
TN66	Rank semi-improved grassland with a sward dominated by Yorkshire-fog with false oat-grass, rough meadow-grass, perennial rye-grass, red fescue. Herbs include broad-leaved dock, common nettle, common mouse-ear, meadow buttercup, creeping buttercup, hogweed, creeping thistle, ribwort plantain, rosebay willowherb, white clover, red clover and colt's-foot.
	
TN67	Hedgerow ash common hawthorn, bramble, dog rose, elder
	





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Target Note	Description
<p>TN68</p> 	<p>Scrub belt consisting of semi-mature ash, alder, goat willow and common hawthorn</p>
<p>TN69</p> 	<p>Large spoil heaps predominantly bare ground but with some colonisation of colt's-foot, common ragwort, rosebay willowherb, great willowherb, bramble, butterfly-bush, sycamore, Yorkshire-fog, black medick and creeping thistle.</p>
<p>TN70</p> 	<p>Surface water attenuation lagoon supporting no aquatic or marginal vegetation.</p>
<p>TN71</p> 	<p>Bund similar supporting species similar in composition to TN69 but more developed.</p>





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Target Note	Description
<p style="text-align: center;">TN72</p> 	<p>Recent broadleaved woodland plantation consisting of a monoculture of alder.</p>
<p style="text-align: center;">TN73</p> 	<p>South quarry currently being actively worked that has vertical rock faces of exposed calcareous rock. In the base of quarry the surface water management system comprising shallow ponds and ditches occasionally support rigid hornwort and small stands of reedmace.</p>
<p style="text-align: center;">TN74</p> 	<p>Hedgerow with semi-mature ash, elder and common hawthorn.</p>
<p style="text-align: center;">TN75</p> 	<p>Drainage ditch taking water from the surface water attenuation lagoon at TN70 before flowing into the swamp area at TN77. Aquatic and wetland species present include water plantain, rigid hornwort, wavy bitter-cress (<i>Cardamine flexuosa</i>), jointed rush, water forget-me-not, pond water crowfoot and pink water speedwell (<i>Veronica catenata</i>).</p>





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Target Note	Description
<p>TN76</p> 	<p>Wet grassland with a lush sward dominated by Yorkshire-fog with creeping bent, rough meadow-grass, perennial rye-grass, timothy, red fescue, hairy sedge (<i>Carex hirta</i>), bottle sedge (<i>Carex rostrata</i>) and hard rush also present. Herbs include silverweed, marsh woundwort (<i>Stachys palustris</i>), creeping thistle, creeping buttercup, meadowsweet, great willowherb, cuckooflower (<i>Cardamine pratense</i>), red clover, marsh stitchwort (<i>Stellaria palustris</i>), water forget-me-not, common mouse-ear, common spotted orchid, meadow vetchling, purple loosestrife (<i>Lythrum salicaria</i>), tufted vetch, black knapweed and marsh thistle.</p>
<p>TN77</p> 	<p>Swamp dominated by reedmace but also contains hard rush, great willowherb, branched bur-reed, water horsetail, marsh stitchwort, silverweed, meadowsweet, purple loosestrife and yellow iris (<i>Iris pseudacorus</i>). Access into the swamp area was not possible due to ground conditions and it is likely that other aquatic and wetland species not listed above may be present in this location including some of those recorded for this site in 2002.</p>
<p>TN78</p> 	<p>Wet grassland similar to structure and species composition to TN76.</p>
<p>TN79</p> <p>No photograph available</p>	<p>Hedgerow consisting of semi-mature ash and common hawthorn.</p>
<p>TN80</p> 	<p>Hedgerow semi-mature ash and common hawthorn with bramble. Trees beginning to show signs of stress due to embankment from TN70 covering lower parts of trunks.</p>





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Target Note	Description
<p>TN81</p> 	<p>New hedgerow consisting of common hawthorn and bird cherry</p>
<p>TN82</p> <p>See photograph in TN82</p>	<p>Dry neutral grassland with a rank sward dominated by Yorkshire-fog and red fescue. Herbs present include lady's bedstraw (<i>Galium verum</i>), hogweed, common mouse-ear, common ragwort, red clover, selfheal, creeping thistle, creeping buttercup and ribwort plantain</p>
<p>TN83</p> 	<p>Drainage ditch flowing in an easterly direction through the central part of the site from the area of swamp at TN77 before leaving the quarry site. It has a mean channel width of 1.5m at normal water level and typically open along much of its length with some small patches of branched bur-reed, water plantain, purple loosestrife and water forget-me-not present.</p> <p>Downstream of the culvert passing under the haul road leading to the South Quarry the right bank has had some recent maintenance works which has created a narrow band of ephemeral/short perennial vegetation that includes common ragwort, white clover, field bindweed, black medick, false oat-grass, meadow vetchling, common nettle, creeping thistle, Yorkshire-fog, creeping buttercup, tufted vetch and poppy, down to and past the site of a weir structure constructed on the watercourse for the monitoring of flows.</p>
<p>TN84</p> 	<p>Horse grazed field dominated by Yorkshire-fog with some sweet vernal-grass, perennial rye-grass and hard rush present. Herbs include creeping cinquefoil, selfheal, common ragwort, cowslip, silverweed, lady's bedstraw, hogweed, creeping thistle, ribwort plantain, red clover and white clover.</p>
<p>TN85</p> 	<p>Hedgerow/scrub belt dominated by common hawthorn with semi-mature ash, elder and bramble</p>





APPENDIX 4-A

Target Note	Description
<p style="text-align: center;">TN86</p> 	<p>A very large spoil mound supporting recolonising bare ground similar to TN69. A hare was observed on the top of this mound in 2011.</p>
<p style="text-align: center;">TN87</p> 	<p>Field as for TN84 but with the addition false oat-grass and common eyebright.</p>
<p style="text-align: center;">TN88</p> 	<p>Bund as for TN69 but with more developed ephemeral and short perennial vegetation.</p>
<p style="text-align: center;">TN89</p> 	<p>Hedgerow dominated by common hawthorn ash hazel, elder and with a very mature wych elm (<i>Ulmus glabra</i>).</p>




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Target Note	Description
TN90 	Hedgerow/scrub belt with semi-mature ash, common hawthorn, elder and bramble and associated dry ditch.
TN91 	Grassland field with some willow scrub development and exposed areas of rock. The sward is dominated by Yorkshire-fog with false oat-grass, timothy and hard rush also present. The herbs include creeping thistle, rosebay willowherb, black knapweed, common cat's-ear, meadow vetchling, autumn hawkbit, common bird's-foot-trefoil, cow slip, silverweed, common ragwort, colt's-foot, white clover and some bramble patches.
TN92 	Recently constructed pond that appears to be ephemeral in nature dominated by stands of reedmace with common spike-rush and jointed rush also present.
TN93 	As for TN92 an ephemeral pond supporting stands of reedmace with common spike-rush and common fleabane present


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Target Note	Description
<p>TN94</p> 	<p>Grassland dominated by false oat-grass with Yorkshire-fog and false brome present. The herb component is sparsely distributed and includes hogweed, broad-leaved dock, common ragwort, meadow vetchling, creeping buttercup, perforate St Johns wort, red clover, common mouse-ear, red bartista, cowslip and white clover</p>
<p>TN95</p> 	<p>Broadleaved woodland plantation of alder and willows (<i>Salix sp.</i>) forming a dense canopy excluding ground and field flora except for bramble and common nettle.</p>
<p>TN96</p> 	<p>Mixed woodland plantation consisting of alder, Scot's pine (<i>Pinus sylvestris</i>) and sitka spruce (<i>Picea sitchensis</i>). The ground flora is similar to TN95</p>
<p>TN97</p> 	<p>Horse grazed calcareous grassland/common hawthorn scrub mosaic that has a tight short species-rich sward comprising the graminoid species of sweet vernal-grass, cock's-foot, red fescue, Yorkshire-fog. The herb component contains a diverse plant assemblage including yarrow, black knapweed, common spotted orchid (27 spikes in 2011), creeping thistle, lady's bedstraw, hogweed, oxeye daisy, common bird's-foot trefoil, ribwort plantain, cowslip, meadow buttercup, creeping buttercup, salad burnet (<i>Sanguisorba minor</i>), common ragwort and red clover with meadowsweet, silverweed and creeping buttercup found in damper low-lying parts of the field</p>

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Target Note	Description
<p>TN98</p> 	<p>Broadleaved woodland plantation consisting of a monoculture of alder.</p>
<p>TN99</p> <p>No photograph available</p>	<p>Spoil mound similar to TN71.</p>
<p>TN100</p> 	<p>Horse grazed pasture with a low cut sward consisting of Yorkshire-fog, oxeye daisy, white clover, ribwort plantain, common ragwort, cowslip, red clover, cock's-foot, hogweed and common mouse-ear and selfheal.</p>
<p>TN101</p> 	<p>Hedgerow dominated by common hawthorn with mature ash and semi-mature sycamore, blackthorn, gorse, elder and bramble.</p>

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Target Note	Description
TN102	Grassland/ scrub mosaic on a well developed area of former low level spoil mounds. The tight sward consists of the graminoid species of Yorkshire-fog, cock's-foot, crested dog's-tail, hard rush, Glaucous sedge and common sedge and the herbs comprising daisy, creeping thistle, black knapweed, common eyebright, hogweed, oxeye daisy, common bird's-foot-trefoil, ribwort plantain, cowslip, mouse-ear hawkweed (<i>Pilosella officinarum</i>), silverweed, creeping cinquefoil, bush vetch and red clover. As shallow ditch flowing in a northerly direction dissects the site adding the overall diversity of the site with creeping bent, great willowherb, branched bur-reed and reedmace present. Common spotted orchid and pyramidal orchid are a conspicuous component of the sward with 321 and 39 spikes respectively counted in 2010.
	
TN103	An adjoining field to TN102 but less diverse in its species and no orchids present but adds to the overall value of the grassland/scrub mosaic in this location.
	

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