

Appendix 7.1

2014 Habitat Survey of Proposed Douglas West & Dalquhandy DP Renewable Energy Project, South Lanarkshire



Dunnock Environmental Services

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1. Introduction

A planning application is being drawn up by 3R Energy for a 15-turbine wind farm and associated wood drying facility at Douglas West and Dalquhandy DP, located to the north west of the village of Douglas in South Lanarkshire (central OS grid reference: NS 820 325, see Figure 1).

In addition to the turbines and wood drying facility, the proposed development would contain associated infrastructure, such as substation/control building, hardstandings, crane pads, access tracks, etc. It is anticipated that the grid connection would be laid largely underground along the former Dalquhandy access road which leaves the north-eastern corner of the site and runs northwards past the Dewars bonded warehouses towards the M74 motorway.

The turbines would be sited largely on land disturbed by the former Dalquhandy Opencast Coal Site and to the north-east of the operational Hagshaw Hill Wind Farm.

As part of this planning application, a suite of ecological and ornithological surveys is being carried out to feed into the Environmental Impact Assessment process. Dunnock Environmental Services (DES) were commissioned by 3R Energy in September 2014 to carry out a habitat survey of the site. This report describes the methods and results of that survey.

2. Site Description

The site (excluding the existing Dalquhandy access road) is 334 ha and consists of two distinctive sections: a northern section and a southern section, which are separated by the former coal haul road, now a tarmac road that crosses the site in an east-west direction.

The northern half of the site consists of previous opencast coal land with operations between 1988 and 2004, including restoration of the majority of the northern section of the site in the mid-1990s. This section has reverted predominantly to a rough grassland consisting of a mixture of Soft-rush (*Juncus effusus*) and Tufted Hair-grass (*Deschampsia cespitosa*) with patches of more open and improved grassland scattered in between. A number of small waterbodies, including former settlement lagoons, and running streams occur across the site. The concrete hardstanding of the former dispatch point (DP) in the north-east corner of the site and the tarmac road are remnants of the previous opencast coal infrastructure.

The southern section of the site consists of unworked land that is more semi-natural in character, although has been drained in the past, and consists of a mixture of Purple Moor-grass (*Molinia caerulea*) dominated wet heath, marshy grassland and acid grassland. There is also a band of young mixed woodland plantation along the southwestern site boundary.

The site sits between the eastern tip of the Todlaw and Cumberhead plantation on the west and Long Plantation on the east. The former is homogenous Sitka Spruce (*Picea sitchensis*) plantation in the area close to the site. The latter, in addition to Sitka Spruce, also has some areas of broadleaved woodland.

The Poniel Water corridor, deeply incised, particularly in the west, runs along the northern boundary of the site (apart from a small central section where it runs north of the site boundary) and the access track to the Hagshaw Hill Wind Farm forms the southern boundary of the site beyond which the rough grassland of the southern section continues south-eastwards for some distance.

The entire site is grazed by sheep and there is a low level of informal recreational use of the site, primarily along the former coal haul road in the centre of the site.

3. Methodology

The survey was carried out on 16th and 19th October 2014. The northern half of the site consists of previously worked and restored opencast coal land. Large areas of this section were re-seeded for use as grazing land and are fairly homogenous and species-poor and were therefore surveyed using the standard Phase 1 Habitat Survey methodology (JNCC, 2007).

The southern section of the site, which consists of unworked land that is more semi-natural in character, was surveyed using the standard National Vegetation Classification (NVC) methodology (Rodwell, 1991 *et seq.*; Rodwell, 2006). NVC communities were determined from quadrat data and checked against TABLEFIT (Hill, 2011) analysis to determine their affinities with different NVC community and sub-community types.

4. Survey Limitations

The survey was carried out during the latter end of the optimal time period (April to October for Phase 1 Habitat Survey and May to September for NVC survey, with the latter period being more appropriate for moorland habitat). Some early flowering species may therefore have been missed. However, this is highly unlikely to have had any significant bearing on the habitat classifications.

5. Habitat and Community Descriptions

The following sections describe each habitat and (sub-)community in turn. For ease of readability, Latin species names are included the first time a species is mentioned; thereafter only the English names are used, with the exception of mosses and lichens where both names are given throughout as English names are not commonly used for these groups. The nomenclature follows Stace (1991) for vascular plants and Smith (2004) for bryophytes. Table 1 below lists the areas of all habitats surveyed in the order of Phase 1 habitats followed by NVC communities. These are shown on the accompanying Figure 1 and illustrated with photos which are cross-referenced with photo points in Figure 1. Any habitats which are too small to map or points of interest are target noted.

Table 1- Phase 1 habitats and NVC communities

Section no.	Phase 1 Habitat / NVC Community	Area (ha)
Phase 1 Habitats		
5.1	A 1.1.2 Broadleaved woodland plantation	0.65
5.2	A 1.3.2. Mixed woodland plantation	10.0
5.3	A 3.1 Scattered broadleaved trees	n/a
5.4	B 1.2 Semi-improved acidic grassland	36.0
5.5	B 4 Improved grassland	4.0
5.6	B 5 Marshy grassland	169.0
5.7	C 1.1 Continuous Bracken	8.5
5.8	Running water	n/a
5.9	Standing water	10.8
5.10	Other - hardstanding area	1.46
NVC Sub-communities		
5.11	H10a <i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath, typical sub-community	0.69
5.12	H21a <i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> - <i>Sphagnum capillifolium</i> heath, <i>Calluna vulgaris</i> - <i>Pteridium aquilinum</i> sub-community	< 0.01
5.13	MG9a <i>Holcus lanatus</i> - <i>Deschampsia cespitosa</i> grassland, <i>Poa trivialis</i> sub-community	32.5
5.14	M15d <i>Scirpus cespitosus</i> - <i>Erica tetralix</i> wet heath, <i>Vaccinium myrtillus</i> sub-community	39.3
5.15	M23b <i>Juncus effusus/acutiflorus</i> rush pasture, <i>Juncus effusus</i> sub-community	10.0
5.16	S9 <i>Carex rostrata</i> swamp	< 0.01
5.17	S11c <i>Carex vesicaria</i> swamp, <i>Carex rostrata</i> sub-community	< 0.01
5.18	S12a <i>Typha latifolia</i> swamp, <i>Typha latifolia</i> sub-community	< 0.01
5.19	U5a <i>Nardus stricta</i> - <i>Galium saxatile</i> grassland, <i>Carex panicea</i> - <i>Viola riviniana</i> sub-community	10.7
Total area		333.6

5.1 Broadleaved woodland plantation

There is an area of broadleaved woodland plantation on the north-west corner of the site (Photo 1), only a small area of which has been mapped as due to the steepness of the banks here, the planted areas along the Poniel Water looked at from above are too narrow to map. The planting continues for approximately 700 m in a band along both banks of the Poniel Water (Photo 2). Species planted include Rowan (*Sorbus aucuparia*), Downy Birch (*Betula pubescens*) and, closer to the Poniel Water, Alder (*Alnus glutinosa*). There are also some mature Ash (*Fraxinus excelsior*) and Alder trees along the Poniel Water which pre-date the main planting.

The field layer varies between Tufted Hair-grass (*Deschampsia cespitosa*) dominated marshy grassland, Wavy Hair-grass (*Deschampsia flexuosa*) dominated acid grassland, dense Bracken (*Pteridium aquilinum*) areas and Heather (*Calluna vulgaris*) dominated patches.



Photo 1- Broadleaved woodland plantation in north-west corner of site



Photo 2 - Broadleaved woodland plantation on mainly Bracken-covered slopes along banks of the Poniel Water

5.2 Mixed woodland plantation

There are two areas of mixed woodland plantation on site. The first is on the south-eastern boundary of the site (Photo 3, Figure 1) and consists of straight rows of planted Alder trees interspersed with a range of species, some of which may have self-seeded, including Willow (*Salix* sp.), Pedunculate Oak (*Quercus robur*), Downy Birch, Beech (*Fagus sylvatica*), Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*) and, in the southern section, Sitka Spruce. In the field

layer there are patches of dense Raspberry (*Rubus idaeus*) and Common Nettle (*Urtica dioica*). Elsewhere, the field layer is a mixture of Tufted Hair-grass (*Deschampsia cespitosa*), Yorkshire-fog (*Holcus lanatus*), Male-fern (*Dryopteris filix-mas*), Ground-elder (*Aegopodium podagraria*), Tormentil (*Potentilla erecta*), Creeping Thistle (*Cirsium arvense*), Barren Strawberry (*Potentilla sterilis*), Devil's-bit Scabious (*Succisa pratensis*) and, in a more disturbed area with some bare ground and shale, Colt's-foot (*Tussilago farfara*). Bryophyte species include Springy Turf-moss (*Rhytidiadelphus squarrosus*) and Common Tamarisk-moss (*Thuidium tamariscinum*).

The second area of mixed woodland plantation runs almost all along the south-western site boundary (Photo 4). Tree species include Downy Birch, Scots Pine (*Pinus sylvestris*) and Larch (*Larix* sp.) on a wet heath field layer which is similar to the adjacent M15 area (section 5.14 below) but with more Hare's-tail Cottongrass (*Eriophorum vaginatum*) and a slightly taller ericoid shrub layer, presumably due to this area being fenced and excluded from grazing.



Photo 3 - Mixed woodland adjacent to the south-eastern site boundary



Photo 4 - Young mixed woodland plantation along the south-western site boundary on an M15 field layer

5.3 Scattered broadleaved trees

There are scattered broadleaved trees at various locations throughout the site, the main ones being located:

- along the disused railway track in the eastern section of the site: scattered trees include Downy Birch, Silver Birch (*Betula pendula*), Goat Willow (*Salix caprea*), Rowan and Pedunculate Oak.
- along some of the burns: there are occasional Willow, Downy Birch and Alder along some of the burns that run through the site and a few mature Pedunculate Oak west of the north-western section of the Poniel Water, just outside the site boundary.
- bordering the largest pond: in the centre of the site trees around the pond include Alder, Pedunculate Oak and Willow.

5.4 Semi-improved acid grassland

There are a few areas of semi-improved acid grassland (Photo 5) in the northern section of the site. These are dominated by Wavy Hair-grass with abundant Tormentil, occasional Yorkshire-fog, Common Bent (*Agrostis capillaris*), Springy Turf-moss (*Rhytidiadelphus squarossus*) and scattered Crested Dog's-tail (*Cynosurus cristatus*), Ribwort Plantain (*Plantago lanceolata*), Common Sorrel (*Rumex acetosa*), Heath Rush (*Juncus squarrosus*) with White Clover (*Trifolium repens*) and Creeping Buttercup (*Ranunculus repens*) in more improved patches. At the time of survey the area was apparently only grazed by some remaining sheep which hadn't been taken off with the flock.



Photo 5 - Semi-improved acid grassland (bright green) in the foreground and marshy grassland (pale yellow/brown) in the background

5.5 Improved grassland

There are several patches of improved grassland throughout the site, the largest ones of which are mapped (Photo 8 below, Figure 1). These occur, e.g., on dry slightly sheltered slopes where sheep rest and are consequently more heavily grazed than the surrounding areas. The main species are Crested Dog's-tail and White Clover with occasional Perennial Rye-grass (*Lolium perenne*), Yorkshire-fog, Creeping Buttercup and Creeping Thistle.

5.6 Marshy grassland

The majority of the northern section of the site is covered in fairly homogenous marshy grassland (Photo 5 above) dominated by Tufted Hair-grass with frequent Jointed Rush (*Juncus articulatus*), Soft-rush (*Juncus effusus*), Common Sorrel, Red-stemmed Feather-moss (*Pleurozium schreberi*) and occasional Creeping Buttercup, Yorkshire-fog and Black Knapweed (*Centaurea nigra*), although these are frequently interspersed with patches of improved grassland.

5.7 Continuous Bracken

There are areas almost exclusively dominated by dense Bracken, mainly in the northwest of the site, particularly along the banks of the Poniel Water.

5.8 Running water

The main watercourse on site is the Poniel Water, which flows in an easterly direction, mostly along the northern site boundary with the exception of a central section where it curves ca. 300 m north of the site boundary (in a diverted channel) then rejoins it. It is the main catchment on site and receives inflow from all of the other streams on site. In the west it flows through mainly Bracken-covered slopes (see Photo 2) and in the eastern section through semi-improved acid and marshy grassland on the southern banks with some wooded sections on the northern banks which are outside the site boundary (Photo 6). For most of its course along the site boundary, it flows through a deeply incised valley, particularly in the west where it is 1 m - 1.5 m wide and ca. 20 cm deep on a stony base. In the eastern section of the site there is still a slope on the northern bank, with level land on the southern bank. In this section it is ca. 2 m wide and ca. 50 cm deep. In the eastern corner of the site it changes direction and flows northwards parallel to the Dalquhandy access road.

Flowing mostly through a valley with few level-lying bankside areas, there are not many patches of riparian bankside vegetation. However, on occasional level-lying sections there are patches dominated almost exclusively by Meadowsweet (*Filipendula ulmaria*) and other patches with a mixture of Meadowsweet, Rosebay Willowherb (*Chamerion angustifolium*), Marsh Bedstraw (*Galium aparine*) and Marsh Horsetail (*Equisetum palustre*). Other level areas are dominated by Jointed Rush with Marsh-marigold (*Caltha palustris*), Ribwort Plantain, Selfheal (*Prunella vulgaris*), Marsh Thistle, Marsh Stitchwort (*Stellaria palustris*) and Creeping Buttercup.



Photo 6 - A small patch of Bulrush (*Typha latifolia*) in the Poniel Water.

The Shiel Burn drains the adjacent coniferous plantation to the west and flows northwards through Bracken-dominated slopes in the north-western section of the site (Photo 7).

The Longhill Burn (Photo 8) flows in its upper reaches through the coniferous plantation on the western boundary of the site then northwards towards the Poniel Water through a band of M23 rush pasture (see section 5.15 below) to the largest pond on site, crossing a small area of S9 *Carex rostrata* swamp (see section 5.16 and Photo 11 below) at its inflow.

The Alder Burn (Photo 9, Figure 1) crosses the eastern section of the site. In the northern section it flows through *Deschamsia cespitosa* dominated marshy grassland and has a small area of S12 *Typha latifolia* swamp (section 5.18) on one section of the east bank (Photo 10).



Photo 7 - The Shiel Burn flowing north towards the Poniel Water



Photo 8 - The Longhill Burn (not visible among the rushes) flowing through a band of M23 rush pasture. On the sloping banks there are also patches of bright green improved grassland with Creeping Thistle.



Photo 9 - Looking upstream along the Alder Burn just south of where it joins the Poniel Water



Photo 10 - A patch of S12 *Typha latifolia* swamp on the east bank of the Alder Burn midway through the site

5.9 Standing water

There are ten ponds on site, varying in size from 24 m² to 2.7 ha. The largest of these was created during the mid-1990s restoration of the former opencast coal site and is located in the centre of the site (Photo 11) and has some adjacent S9 *Carex rostrata* swamp area (section 5.16), a narrow strip of S12 *Typha latifolia* swamp and bordering Alder and Willow trees. The other ponds have varying amounts of emergent and bankside vegetation, with species including Floating Sweet-grass (*Glyceria fluitans*), Bulrush, Soft-rush, Jointed Rush, Tufted Hair-grass, Sedges and Bog-mosses (*Sphagnum* spp.). These ponds are described in further detail in the Great Crested Newt habitat suitability report (DES, 2014a).



Photo 11 - An area of S9 *Carex rostrata* swamp where the Longhill Burn meets the central pond

5.10 Other - hardstanding area

There is a remaining hardstanding area from the former Dalquhandy opencast coal site (the dispatch point) adjacent to the road in the northeast of the site.

5.11 H10a *Calluna vulgaris* - *Erica cinerea* heath, typical sub-community

There are two small pockets of H10 *Calluna vulgaris* - *Erica cinerea* heath, one on the embankment of the disused railway line along the eastern site boundary and the other one on a mound south-west of the central pond (Photo 12). These areas are dominated by Heather with frequent Glittering Wood-moss (*Hylocomnium splendens*), occasional Wavy Hair-grass, Tormentil and scattered

Crowberry (*Empetrum nigrum*), Blaeberry (*Vaccinium myrtillus*), Heath Rush (*Juncus squarrosus*), Mat-grass (*Nardus stricta*) and Cup Lichen (*Cladonia* sp.). This community corresponds to the H10a *Calluna vulgaris* - *Erica cinerea* heath, typical sub-community (goodness-of-fit 66).



Photo 12 - An H10 Heather dominated slope southwest of the pond in the centre of the site

5.12 H21a *Calluna vulgaris* - *Vaccinium myrtillus* - *Sphagnum capillifolium* heath, *Calluna vulgaris* - *Pteridium aquilinum* sub-communitiy

There are some areas of heath on the banks of the Poniel Water. As these banks are steep in sections, the heath areas cannot be mapped when looking from above therefore an example area is target noted below.

Target note 1 (NS 80245 33241) - An area of heath on the eastern bank of the Poniel Water (Photo 13) which is dominated by Heather with abundant Glittering Wood-moss (*Hylocomnium splendens*), frequent Hard-fern (*Blechnum spicant*), Common Haircap (*Polytrichum commune*) and occasional Blaeberry, Tormentil, Heath Bedstraw (*Galium saxatile*), Wavy Hair-grass and Cup Lichen (*Cladonia* sp.). Although the community yielded fits with both the H10 *Calluna vulgaris* - *Erica cinerea* heath community (goodness-of-fit 68) and the H21a *Calluna vulgaris* - *Vaccinium myrtillus* - *Sphagnum capillifolium* heath, *Calluna vulgaris* - *Pteridium aquilinum* sub-community (goodness-of-fit 64), the latter is more appropriate due to the presence of frequent Hard-fern.



Photo 13 - The eastern bank of the Poniel Water with a changeover from a Bracken-dominated area in the right of the photo to an H21a Heather dominated area to the left

5.13 MG9a *Holcus lanatus* - *Deschampsia cespitosa* grassland, *Poa trivialis* sub-community

The southern section of the site supports a large area of grassland (Photo 14) dominated by Tufted Hair-grass with frequent Jointed Rush and/or Soft-rush and Yorkshire-fog, occasional Springy Turf-moss (*Rhytidiadelphus squarrosus*) and scattered Ribwort Plantain, Creeping Buttercup and Marsh Thistle (*Cirsium palustre*). This community shows a good fit with the MG9a *Holcus lanatus* - *Deschampsia cespitosa* grassland, *Poa trivialis* sub-community (goodness-of-fit score: 77).



Photo 14 - Looking north-east across an MG9 grassland area located in the south of the site

5.14 M15d *Scirpus cespitosus* - *Erica tetralix* wet heath, *Vaccinium myrtillus* sub-community

The southern section of the site has extensive areas of M15 wet heath (Photo 15). These areas are dominated by Purple Moor-grass (*Molinia caerulea*) with frequent Heather, Glittering Wood-moss (*Hylocomnium splendens*), Cross-leaved Heath (*Erica tetralix*) and Mat-grass, occasional Blaeberry, Tormentil, Heath Rush, Deergrass (*Trichophorum cespitosum*), Red-stemmed Feather-moss (*Pleurozium schreberi*), Common Haircap (*Polytrichum commune*) and some scattered Wavy Hair-grass, Sheep's Fescue (*Festuca ovina*), Common Cottongrass (*Eriophorum angustifolium*), Soft-rush, Springy Turf-moss (*Rhytidiadelphus squarrosus*) and Cup Lichen (*Cladonia* sp.). There are occasional small wetter pockets with *Sphagnum* mosses, including *Sphagnum capillifolium*, *S. cuspidatum* and *S. compactum*. From areas observed where peaty substrate has been exposed, it is less than 0.5 m deep. These species yielded a goodness-of-fit score of 73 for the M15d *Scirpus cespitosus* - *Erica tetralix* wet heath, *Vaccinium myrtillus* sub-community.



Photo 15 - Looking southwest across an area of M15 in the south of the site

5.15 M23b *Juncus effusus/acutiflorus* rush pasture, *Juncus effusus* sub-community

There are bands of rush pasture along burns in the south of the site and occasional scattered pockets in the north of the site which are too small to map. These are dominated by either Soft-rush or Jointed Rush with frequent Common Sorrel, Yorkshire-fog and scattered Common Marsh-bedstraw (*Galium palustre*), Meadow Buttercup (*Ranunculus acris*), Ribwort Plantain and Tufted hair-grass. The community corresponds to the M23b *Juncus effusus/acutiflorus* rush pasture, *Juncus effusus* sub-community (goodness-of-fit score: 77).

5.16 S9 *Carex rostrata* swamp

This area is too small to map but is target noted below.

Target note 2 (NS 81990 32584) - on the southern tip of the central pond there is an area of Bottle Sedge (*Carex rostrata*) swamp (ca. 5 m x 7 m, Photo 11 above). It was not possible to safely walk on the substrate to take quadrat data. However, as far as could be seen it is exclusively dominated by Bottle Sedge and the area can clearly be assigned to the S9 community, most likely S9a, the *Carex rostrata* sub-community which includes pure and very species-poor areas overwhelmingly dominated by Bottle Sedge.

5.17 S11c *Carex vesicaria* swamp, *Carex rostrata* sub-community

This area is too small to map and is thus target noted below.

Target note 3 (NS 81098 33194) - on the northwestern edge of a pond in the northwest of the site there is an area almost exclusively dominated by Common Sedge (*Carex nigra*) with a patch of Marsh Cinquefoil (*Potentilla palustris*) (Photo 16). The community does not fit well into any NVC category but shows a slight affinity with the S11c *Carex vesicaria* swamp, *Carex rostrata* sub-community (goodness-of-fit score: 44). It is possible that if data are collected earlier in the season a slightly more accurate fit can be made. However, there is no community dominated by Common Sedge so a good fit will probably not be attained.



Photo 16 - Common Sedge-dominated area with a small area of Marsh Cinquefoil in the foreground

5.18 S12a *Typha latifolia* swamp, *Typha latifolia* sub-community

This area is too small to map and is thus target noted below:

Target note 4 (NS 82742 32656) - on the east bank of the Alder Burn there is an area of Bulrush swamp (Photo 10 above) which is exclusively dominated by Bulrush and has therefore been assigned to the S12a *Typha latifolia* swamp, *Typha latifolia* sub-community, where pure stands of Bulrush are common.

There are smaller pockets of Bulrush elsewhere, such as on the Poniel Water (Photo 6 above).

5.19 U5a *Nardus stricta* - *Galium saxatile* grassland, *Carex panicea* - *Viola riviniana* sub-community

In the southern section of the site there is an area of acid grassland dominated by Mat-grass with occasional Sheep's Fescue, Purple Moor-grass, Tufted Hair-grass, Tormentil, Heath Bedstraw, Springy Turf-moss (*Rhytidiadelphus squarrosus*) and Common Haircap (*Polytrichum commune*). The community corresponds to the U5a *Nardus stricta* - *Galium saxatile* grassland, *Carex panicea* - *Viola riviniana* sub-community (goodness-of-fit score: 70).

6. Groundwater Dependent Terrestrial Ecosystems (GWDTEs)

Those communities that are classed as Groundwater Dependent Terrestrial Ecosystems (GWDTEs) all have either a moderate or low Groundwater Dependency Score (Table 2). These should be further assessed and if hydro-geological screening shows at least a moderate interaction with groundwater (UK TAG, 2003), a risk assessment should be carried out. However, this needs to take into account that habitats in the northern section of the site were heavily disturbed during opencast coal mining operations which would have altered the underlying hydrology while in the south of the site there has been a history of land drainage.

Table 2 - NVC communities on site with dependency on groundwater

NVC Community	NVC Community Name	Area on site (ha)	Scotland Groundwater Dependency Score ¹ 1=high, 2=moderate, 3=low
M15	<i>Scirpus cespitosus</i> - <i>Erica tetralix</i> wet heath	39.3	2
M23	<i>Juncus effusus/acutiflorus</i> - <i>Galium palustre</i> rush-pasture	10.0	2
MG9	<i>Holcus lanatus</i> - <i>Deschampsia cespitosa</i> grassland	32.5	2
S9	<i>Carex rostrata</i> swamp	< 0.01	3
S11	<i>Carex vesicaria</i> swamp	< 0.01	2
S12	<i>Typha latifolia</i> swamp	< 0.01	3
U5	<i>Nardus stricta</i> - <i>Galium saxatile</i> grassland	10.7	3

¹ from UK TAG (2003), table updated 5th October 2009

7. Faunal Records

Protected species surveys have been carried out separately, the results of which are covered in DES (2014a, 2014b, 2014c).

8. Discussion

The site consists of two discrete parts. The northern section was worked as part of the Dalquhandy opencast site operations from 1988 and was restored in the mid-1990s. The habitats there have been significantly affected and are at a fairly early successional stage, consisting primarily of rather species-poor marshy grassland dominated by Tufted Hair-grass and rushes, complemented by some areas of semi-improved acid grassland and small pockets of other habitat including Bracken, scattered broadleaved trees, broadleaved plantation and swamp.

In contrast, the southern section of the site was not worked in the past and sits on the interface between enclosed lowland fields and the lower extremity of unenclosed upland moorland. It is more semi-natural in character and consists of a mixture of degraded bog, which is now wet heath through previous land drainage and grazing, marshy grassland, rush pasture and acid grassland. Small pockets of these more semi-natural habitats persist in the northern section of the site in areas that were not worked. For instance, wet heath patches occur around a pond along the northern boundary, interspersed with shaley exposures and Bog-moss patches.

Most of the communities in the southern section are classed as GWDTEs to some degree. The M15 wet heath, M23 rush pasture and MG9 grassland score as moderately groundwater dependent, while the U5 acid grassland only has a low groundwater dependency score. In the north, there are small areas of groundwater dependent habitats associated with either standing or running water, such as the S9 swamp adjacent to the central pond and small pockets of S12 swamp along burns.

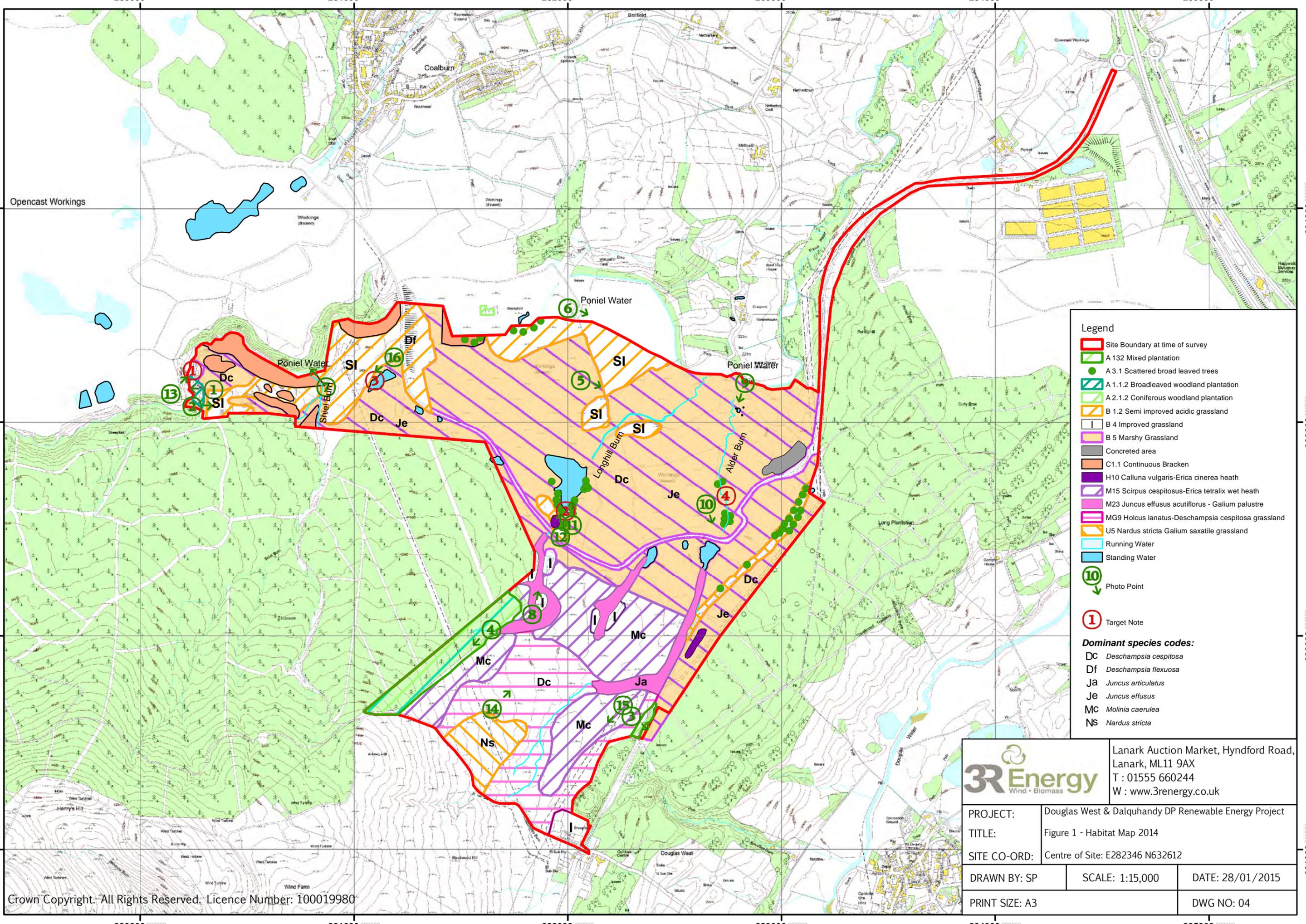
Some of these GWDTEs could potentially be affected by the proposal. Once the site layout has been finalised, any effects of the development on GWDTEs will require further investigation and analysis, depending on the underlying hydrogeology. Given the high degree of modification in the north of the site and the small areas of GWDTEs that occur there, it is questionable whether further investigation there is meaningful.

9. References

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Legend

- Site Boundary at time of survey
- A 132 Mixed plantation
- A 3.1 Scattered broad leaved trees
- A 1.1.2 Broadleaved woodland plantation
- A 2.1.2 Coniferous woodland plantation
- B 1.2 Semi improved acidic grassland
- B 4 Improved grassland
- B 5 Marshy Grassland
- Concreted area
- C1.1 Continuous Bracken
- H10 Calluna vulgaris-Erica cinerea heath
- M15 Scirpus cespitosus-Erica tetralix wet heath
- M23 Juncus effusus acutiflorus - Galium palustre
- MG9 Holcus lanatus-Deschampsia cespitosa grassland
- U5 Nardus stricta Galium saxatile grassland
- Running Water
- Standing Water
- 10 Photo Point
- 1 Target Note

Dominant species codes:

- DC *Deschampsia cespitosa*
- Df *Deschampsia flexuosa*
- Ja *Juncus articulatus*
- Je *Juncus effusus*
- MC *Molinia caerulea*
- NS *Nardus stricta*

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