

Red John Pumped Storage Hydro Scheme

Volume 5, Appendix 6.1: NVC
Survey

ILI (Highlands PSH) Ltd.

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Quality information

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Appendix 6.1 NVC Survey

6.1 Introduction

- 6.1.1 This appendix provides National Vegetation Classification (NVC) survey information and accompanies Chapter 6: Terrestrial Ecology (Volume 2). The NVC is a detailed phytosociological categorisation of the vegetation types that occur in UK habitats. It comprises defined plant communities that are often divided into sub-communities.
- 6.1.2 NVC codes are alphanumeric. The initial capital letter(s) and number denote the NVC community, and any lower case letter the sub-community. The initial letter(s) represent broad vegetation types, those found during this survey comprising the following:
- W = Woodland (includes both woodland proper and scrub);
 - M = Mire (includes bogs, wet heaths, flushes and wetter rushy vegetation);
 - H = Heath (dry heaths);
 - MG = Mesotrophic Grassland (neutral grassland);
 - U = Upland (includes acid grassland and bracken);
 - S = Swamp;
 - A = Aquatic vegetation;
 - OV = Open Vegetation (includes dense stands of weeds).

6.2 Methods

- 6.2.1 Homogenous vegetation stands were classified according to the NVC as described in the relevant original NVC volumes (Ref 6, Ref 7, Ref 8, Ref 9, Ref 10), with reference also to NVC reviews and guidance (Ref 11; Ref 2; Ref 5) that describe some additional vegetation types. Vegetation was assigned to sub-community where possible. Since NVC communities can occur in patches too small to map amongst more extensive communities, or in complexes that cannot be feasibly mapped within a reasonable timescale, NVC polygons were described as mosaics as necessary, with estimated percentage proportions of the mosaic components including (where substantial) non-vegetative components such as open water.
- 6.2.2 Areas of road, tracks, other hard-standing and buildings were excluded from the NVC mapping. The south-east extension of the 250 m buffer on above-ground infrastructure, which runs parallel to the minor the road, was also excluded from the survey, because works in this area are expected to comprise only resurfacing and other superficial works to the road. Where other habitats lacked vegetation, or the vegetation did not correspond to vegetation described in the NVC volumes or other guidance (Ref 11; Ref 2), a very brief description was given (e.g. 'Conifer plantation'; 'Open water'; 'Quarry'). Note however that if conifer plantation is Scots pine *Pinus sylvestris* and it has a heathy ground flora then it does constitute an NVC type (W18).
- 6.2.3 The NVC survey was carried out by specialist botanical and habitat ecologists with practical experience of using the NVC in the period June to September 2018.
- 6.2.4 Vascular plant nomenclature in this appendix follows Stace (2010; Ref 13), and for bryophytes Atherton *et al* (2010; Ref 1). Where the original NVC community names

incorporate superseded species names, these have been changed to the current accepted names.

6.3 Description of recorded vegetation

6.3.1 A map of the recorded NVC communities is given in Figure 6.1.1: National Vegetation Classification (included at the end of this appendix). Colour codes on Figure 6.1.1 are Phase 1 habitats and are given to aid readability (a key to Phase 1 habitat colour codes is given on Figure 6.1.2, which shows Phase 1 habitats only). Quadrat data for examples of various NVC types are provided in the Annex at the end of this report.

6.3.2 The recorded NVC types are listed in Table 6.1 below, which provides area in hectares (ha), percentage of the survey area, and very brief descriptions. Fuller descriptions of these vegetation types, including recorded sub-communities, is given further below.

Table 6.1 NVC communities recorded within the survey area

Type	Code	Area (ha)	%	Abbreviated Description
Woodland / Scrub	W4	2.11	0.433	Flushed acid woodland
	W7	6.11	1.255	Flushed neutral woodland
	W9	15.23	3.128	Dry / damp neutral woodland
	W11	19.09	3.920	Dry acid woodland
	W17	17.78	3.651	Dry acid heathy / very mossy woodland
	W18	66.24	13.602	Dry acid heathy Scots pine woodland
	W19	0.18	0.037	Dry acid juniper <i>Juniperus communis</i> wood
	W22	0.48	0.099	Blackthorn scrub
	W23	2.39	0.492	Gorse scrub
	Heavily-grazed woodland	0.33	0.068	Broadleaf wood within enclosed grazed pasture, too heavily grazed to fit NVC
	Broadleaf plantation	0.37	0.076	Non-native broadleaf plantation; no NVC
	Mixed plantation	0.05	0.011	Non-native mixed plantation; no NVC
	Conifer plantation	151.77	31.166	Non-native conifer plantation, or Scots pine plantation with little heather; no NVC
	Felled plantation	28.05	5.761	Recently felled conifer plantation; no NVC
	Mire	M1	0.95	0.195
M2		0.15	0.032	<i>Sphagnum cuspidatum</i> / <i>fallax</i> pools
M6		3.53	0.726	Acid flush with sedges and / or rushes
M10		0.55	0.114	Basic flush, typically species-rich
M15		22.27	4.574	Wet heath
M17		2.63	0.540	Wetter oceanic blanket bog
M19		12.43	2.552	Drier boreal blanket bog
M20		0.72	0.148	Bog with hare's-tail cottongrass <i>Eriophorum vaginatum</i> dominant and sparse ericoids
M23	0.84	0.172	Neutral flush / pasture dominated by rushes	

Type	Code	Area (ha)	%	Abbreviated Description
	MX	0.20	0.042	Neutral sedge-dominated equivalent of M23
	M25	3.83	0.787	Purple moor-grass <i>Molinia caerulea</i> -dominated vegetation
Dry heath	H9	0.55	0.112	Species-poor heather <i>Calluna vulgaris</i>
	H10	0.08	0.016	Heath including bell heather <i>Erica cinerea</i>
	H12	21.34	4.383	Heather / bilberry <i>Vaccinium myrtillus</i> heath
Mesotrophic grassland	MG1	0.17	0.036	Neutral grassland with tall coarse grasses
	MG5	1.66	0.342	Short species-rich neutral grassland
	FH	0.67	0.137	Short species-poor neutral grassland, without significant cover of agricultural species
	MG6	28.86	5.926	Improved grassland with agricultural species
	MG9	0.24	0.050	Damp neutral grassland with tufted hair-grass <i>Deschampsia cespitosa</i> dominant
	MG10	0.73	0.150	Damp species-poor soft rush <i>Juncus effusus</i>
Acid grassland	U4	3.95	0.811	Acid grassland, no mat grass <i>Nardus stricta</i>
	U5	0.19	0.039	Acid grassland with much mat grass
	U20	29.50	6.057	Dense bracken
Swamp and aquatic vegetation	S9	0.50	0.103	Bottle sedge <i>Carex rostrata</i> swamp
	S14	0.01	0.002	Bur-reed <i>Sparganium erectum</i> swamp
	S19	0.03	0.006	Spike rush <i>Eleocharis palustris</i> swamp
	S27	0.31	0.063	Fen, intermediate between swamp and M23
	A22	5.63	1.157	Water with shoreweed <i>Littorella uniflora</i>
	A24	0.09	0.019	Water with bulbous rush <i>Juncus bulbosus</i>
Weed vegetation and other	OV25	0.06	0.012	Stands of common nettle <i>Urtica dioica</i>
	OV27	0.04	0.009	Stands of rosebay willowherb <i>Chamerion angustifolium</i>
	Pebbles	0.55	0.113	Pebble shore of Loch Ness
	Quarry	0.22	0.044	Quarry with no significant vegetation
	Open water	33.25	6.829	Open water with no observed vegetation

Woodland - coniferous

- 6.3.3 The greatest extent of woodland within the survey area is conifer plantation, most of which is located north-east of Ashie Moor. Approximately one quarter of the conifer plantation was identified as Scot's pine with a heathy ground flora, which corresponds to the plantation form of W18b (*Pinus sylvestris* – *Hylocomium splendens* woodland, *Vaccinium myrtillus* – *Vaccinium vitis-idaea* sub-community). Typically both heather and bilberry are present in the surveyed woodland of this type, and there is often also a small amount of cowberry *Vaccinium vitis-idaea*. The range of associated species is rather small (as is typical) but includes large pleurocarpous mosses of acid conditions, such as *Hylocomium splendens* and *Pleurozium schreberi*, and common acid grasses such as wavy hair-grass *Deschampsia flexuosa* and common bent *Agrostis capillaris*. Occasionally chickweed-wintergreen *Trientalis europaea* is found within the Scots pine plantation, a species which

sets seed and colonises poorly, and is suggestive of long-established and potentially ancient woodland.

- 6.3.4 There are also, in the open swathe of vegetation in the proposed headpond location, a few small patches of W18b of apparent self-sown origin as well as occasional small plantation patches. Again, the flora is heathy but the likely self-sown areas tend to be quite open, as is often the case with natural W18, and there is often some downy birch *Betula pubescens*.
- 6.3.5 Other Scots pine woodland is plantation without a significant heath component (typically dominated instead by acid grasses with scattered dryopterid ferns, such as broad buckler-fern *Dryopteris dilatata*), which does not correspond to an NVC type.
- 6.3.6 All other conifer plantation is dominated by non-native trees (mainly Sitka spruce *Picea sitchensis* and larch *Larix* sp.), also not corresponding to an NVC type. The ground flora of the larch plantation tends to be predominantly composed of acid grasses, whilst that of the spruce plantation is much-impooverished by the heavy shade and persistent acidic leaf litter.
- 6.3.7 Of the plantation woodland, the W18b has by far the most habitat / botanical value since it most closely resembles a natural woodland type.
- 6.3.8 Some swathes of conifer plantation were recently felled at the time of survey, with a much-disturbed and impoverished ground flora, and these are shown in Figure 6.1.1. A few areas had been felled in the more distant past and had developed semi-natural vegetation (H12c, as shown in Figure 6.1.1). In the plantation near Ashie Moor there are also open areas of wet vegetation with (mostly) natural plant communities, as shown in Figure 6.1.1 and described further below under the relevant sections.

Woodland - broadleaved

- 6.3.9 Aside from a very small amount of non-native broadleaved plantation (mainly comprising mature beech *Fagus sylvatica*), the broadleaved woodland within the survey area is semi-natural and, on the slopes running up from Loch Ness, of ancient origin.
- 6.3.10 The majority of the woodland on the lower slopes by and shortly above Loch Ness is W9a (*Fraxinus excelsior* – *Sorbus aucuparia* – *Mercurialis perennis* woodland, Typical sub-community), which is dominated here by downy birch *Betula pubescens* and hazel *Corylus avellana*, with occasional ash *Fraxinus excelsior* and oak *Quercus* sp. Characteristic ground flora species in this woodland, in the lower parts especially, include enchanter's nightshade *Circaea* sp., sanicle *Sanicula europaea*, primrose *Primula vulgaris*, bugle *Ajuga reptans*, wood sorrel *Oxalis acetosella* honeysuckle *Lonicera periclymenum* and bluebell *Hyacinthoides non-scripta*. Locally there is dog's mercury *Mercurialis perennis*, often along small stream banks where grazing is less intense (it is preferentially grazed by deer, of which both roe deer *Capreolus capreolus* and non-native sika deer *Cervus nippon* are frequent in the area). In many places, and often dominant slightly higher up the slopes, there is wood false-brome *Brachypodium sylvaticum*, often with a good moss layer including much *Rhytidiadelphus triquetrus*. The most frequent fern is hard fern *Blechnum spicant*, but larger ferns including *Dryopteris filix-mas* also occur more sparsely, and locally (particularly in stream incisions) both beech fern *Phegopteris connectilis* and oak fern *Gymnocarpium dryopteris* are found. Deer-grazed sprigs of holly *Ilex aquifolium* are common on the ground, and there are occasional large holly shrubs in the understorey.
- 6.3.11 Individual plants of bird's-nest orchid *Neottia nites-avis* were observed at at least six locations within the W9a woodland. This parasitic species is cryptic in colouration and liable to be under-recorded where present, and may be more abundant here than it appears;

certainly it occurs over a wide area of this ancient woodland. Bird's-nest orchid is a highly localised species in Scotland, and is listed as 'Near Threatened' in the Red Data List for Great Britain (Ref 3).

- 6.3.12 The higher slopes above Loch Ness transition into W11b (*Quercus petraea* – *Betula pubescens* – *Oxalis acetosella* woodland, *Blechnum spicant* sub-community). This is more acidic than the W9, and less diverse, with birch dominant, and more grasses typical of acid conditions such as creeping soft-grass *Holcus mollis*, sweet vernal-grass *Anthoxanthum odoratum* and common bent. Wood sorrel is common, and in some places bracken *Pteridium aquilinum* is abundant. Bracken is particularly abundant towards the north-east (east part of 'Balnafoich Coverts') where the woodland often has a more open canopy.
- 6.3.13 The invasive non-native plant rhododendron *Rhododendron ponticum* is rare in the surveyed W9 / W11, but it has been subject to purposeful recent eradication efforts, with several destroyed patches evident. This process appears to be on-going, and it is likely that little or no rhododendron will be present in the path of proposed access routes etc. at the time of construction.
- 6.3.14 In addition to the above drier types of semi-natural broadleaved woodland, there are also flushed neutral patches within that woodland corresponding to W7 (*Alnus glutinosa* – *Fraxinus excelsior* – *Lysimachia nemorum* woodland). W7b (*Carex remota* – *Cirsium palustre* sub-community) and W7c (*Deschampsia cespitosa* sub-community) were identified, but the former is more common. A small amount of W7a (*Urtica dioica* community) was also noted close to Loch Ness. Despite the community name, alder *Alnus glutinosa* is not necessarily present, and often is not at this site. W7c is rather poor with tufted hair-grass and creeping soft-grass and rather few herbs. However, the W7b, which in particular occupies significant patches of the lower wooded slopes near Loch Ness, is fairly diverse with a range of non-acidic wet woodland species including remote sedge *Carex remota*, yellow pimpernel *Lysimachia nemorum*, creeping buttercup *Ranunculus repens* and, most notably on this site, smooth-stalked sedge *Carex laevigata*. Of local occurrence in the W7a close to Loch Ness is alternate-leaved golden-saxifrage *Chrysosplenium alternifolium*, which is a much less common species than opposite-leaved golden-saxifrage; also of note here is a large hazel growing as a relatively tall tree rather than the normal lower-growing self-coppiced form.
- 6.3.15 Acidic flushed woodland (W4, *Betula pubescens* – *Molinia caerulea* woodland) also occurs within the survey area, as small patches primarily in the proposed headpond area. These patches are mostly dominated by downy birch, occasionally by eared willow *Salix aurita* in a scrub form of this woodland type. Both W4b (*Juncus effusus* sub-community) and W4c (*Sphagnum* sub-community) were recorded. Neither are particularly diverse. Purple moor-grass is generally present in both. The W4b has a range of acidic to neutral accompanying herbs and grasses including soft rush, tufted hair-grass, Yorkshire fog *Holcus lanatus*, marsh thistle *Cirsium palustre*, tormentil *Potentilla erecta* and marsh violet *Viola palustris*. W4c is less common within the survey area, and is particularly wet with bog-mosses such as *Sphagnum palustre* and *Sphagnum fallax*. Both forms have a resemblance to an M6 open flush (see below) with trees, and in many cases M6 flushes do occur adjacent.
- 6.3.16 Finally, birch with a heathy ground flora (including heather and bilberry) occurs as a few small patches in the headpond area, and much more widely in the large semi-natural area at the northern edge of the survey area. This is a birch-dominated equivalent to W18 and is

referable to W17b (*Quercus petraea* – *Betula pubescens* – *Dicranum majus* woodland, Typical sub-community).

Scrub

- 6.3.17 A notable scrub community in the survey area and adjacent areas is W19 juniper scrub, which is a nationally-scarce vegetation type. Although juniper scrub can contain abundant birch, observed juniper largely occurs either as single or sparse bushes amongst heath, marsh or flush, or with gorse. By far the largest amount of juniper occurs on Ashie Moor beyond the survey area, where it occurs with gorse either in dense stands or more scattered across the wet and dry heaths in that area. There are also many scattered bushes in the large semi-natural area in the north of the survey area, and in the area north-east of 'Park' farm. Widely-scattered bushes occur in glades and rides amongst the ancient woodland above Loch Ness. Only one patch of actual W19 was mapped within the survey area – this is in an open ride above Loch Ness where there is a localized high density of juniper. Elsewhere within the survey area juniper is too sparse to refer to W19 (W19 on Ashie Moor is outside the survey area). There is very little juniper within the proposed headpond area, amounting to less than twenty bushes, compared to an estimate of approximately 1,000 bushes in the wider area including Ashie Moor.
- 6.3.18 The dominant other scrub form is W23 dense gorse scrub, which occurs as numerous small and occasionally large patches. There are also a few small areas of W22 dense blackthorn *Prunus spinosa* scrub. Neither is of particular ecological note.

Mires – bog and basin mire

- 6.3.19 Blanket bog vegetation within the survey area occurs primarily on the open ground between the forestry in the proposed headpond area, and on Ashie Moor. There are also small pockets of blanket bog vegetation within the conifer plantation, often with other wet vegetation types in patches mapped as Phase 1 basin mire.
- 6.3.20 Except on Ashie Moor, the blanket bog vegetation type is M19 (*Calluna vulgaris* – *Eriophorum vaginatum* blanket mire). This is a drier and more boreal bog type with hare's-tail cottongrass and heather in variable proportions. The former may dominate over heather but there is always at least a moderate cover of ericoids (otherwise the vegetation becomes M20 – see below). The driest forms are referable to M19b (*Empetrum nigrum* ssp. *nigrum* sub-community), with less *Sphagnum* (usually only *Sphagnum capillifolium*) and typically large amounts of acid pleurocarpous mosses such as *Hylocomium splendens* and *Pleurozium schreberi*; they also commonly contain some crowberry *Empetrum nigrum* and bilberry, and occasionally cowberry. Some of the M19, however, is moderately wet with cross-leaved heath *Erica tetralix* scattered amongst the vegetation, a larger coverage of *Sphagnum capillifolium* and occasionally small amounts of deergrass *Trichophorum germanicum* – this is referable to M19a (*Erica tetralix* sub-community), the wetter sub-community of M19 that here is effectively transitional to the more oceanic M17.
- 6.3.21 It should be noted that although often relatively dry, this is typical of M19 and does not imply that it is significantly degraded. However, some M19 that occurs within the conifer plantation is degraded by drainage and ground disturbance, and is mapped as Phase 1 modified bog. Towards Lochan na Curra there is more modified bog that has suffered recent burning, and both burnt bog and unburnt bog are extensive southwards from Lochan na Curra (outside the survey area). The recently-burnt areas suffer from severe reduction or total loss of ericoids (such as heather) and are dominated by hare's-tail cottongrass (causing large

swathes of the landscape to turn white when in flower) with few associated species, corresponding to the poor blanket bog community M20 (*Eriophorum vaginatum* blanket and raised mire).

- 6.3.22 On Ashie Moor much of the blanket bog (both within and beyond the survey area) is M17 (*Trichophorum germanicum* – *Eriophorum vaginatum* blanket mire). This is the more oceanic blanket bog form. Surveyed M17 is M17a (*Drosera rotundifolia* – *Sphagnum* spp. sub-community): this the wettest form in low-lying areas, with a high cover of *Sphagnum* including *Sphagnum papillosum*, amongst the vascular plants which primarily comprise hare's-tail cottongrass, heather (often less than in M19), cross-leaved heath, deergrass and common cotton-grass *Eriophorum angustifolium*, often with bog asphodel *Narthecium ossifragum*. There are often very wet runnels and pools in this type of bog, including in the limited amount within the survey area, which comprise a mix of vegetation types including M1, M2 and M6. M1 and M2 are bog pool / runnel vegetation types with much *Sphagnum*, which includes *Sphagnum denticulatum* in M1, whilst M2 is dominated by *Sphagnum cuspidatum* and / or *Sphagnum fallax*. M6 is an acidic flush which in wettest form approaches M2 but has an abundance of small sedges, especially star sedge *Carex echinata* (M6 is further described below under 'Mires – flushes').
- 6.3.23 The extents of blanket bog beyond the survey area to the south-east, on Ashie Moor and on the lower ground around and beyond Lochan na Curra, are substantial and much more extensive than the relatively small quantities within the survey area. Although some this bog outside the survey area has been burnt, there are substantial intact blanket bog areas, including: a) a notable and extensive transition from swamp to bog immediately south of Lochan na Curra, in which intermediate vegetation dominated by variable proportions of bottle sedge, hare's-tail cottongrass and *Sphagnum* occurs, with an open canopy of downy birch; and b) notably extensive basic flushes within blanket bog on Ashie Moor.

Mires – flushes, basin mires and rush-dominated vegetation

- 6.3.24 The most commonly-occurring flush in the survey area, as is commonly and normally the case at low altitude in Scotland, is acid flush corresponding to M6 (*Carex echinata* – *Sphagnum fallax* / *denticulatum* mire). This type of flush occurs both with and without rushes *Juncus* spp., and both forms occur within the survey area.
- 6.3.25 The most abundant form is M6a (*Carex echinata* sub-community), which is one of the wetter forms and contains an abundance of small sedges, in particular star sedge and common sedge *Carex nigra*. One at least of the mosses *Sphagnum palustre*, *Sphagnum fallax* or *Polytrichum commune* are common in the bryophyte layer. This type of flush contains various vascular plants in variable abundance, including common cottongrass *Eriophorum angustifolium*, tormentil, purple moor-grass *Molinia caerulea*, bog asphodel, marsh violet, marsh horsetail *Equisetum palustre* and occasionally species of particularly wet conditions such as water horsetail *Equisetum fluviatile* and marsh pennywort *Hydrocotyle vulgaris*. There can be a small amount of cross-leaved heath or hare's-tail cottongrass. Bog-pondweed *Potamogeton polygonifolius* sometimes occurs but often (on this site) this indicates a shift to M1 bog pool / runnel, and transitions occur between M1 and M6a.
- 6.3.26 Of particular note in one location on the part of Ashie Moor within the survey area is a stand of M6a containing slender sedge *Carex lasiocarpa*, which is labelled in Figure 6.1.1 as 'M6a (Cxlas)'. Slender sedge is a less common and rather sparsely distributed sedge species.

- 6.3.27 Also recorded in smaller quantity are M6b (*Carex nigra* – *Nardus stricta* sub-community) and M6c (*Juncus effusus* sub-community). The latter is much like M6a but typically less diverse with abundant soft rush, whilst M6b is less wet with a significant grass component whilst retaining abundance of sedges including both star sedge and common sedge.
- 6.3.28 M6 flushes are mainly found in open areas within and adjacent to the conifer plantation (including locally within the proposed headpond area), and on Ashie Moor.
- 6.3.29 More locally with the survey area there are basic flushes corresponding to M10a (*Carex dioica* – *Pinguicula vulgaris* mire, *Carex demissa* – *Juncus bulbosus* sub-community). These are considerably more diverse than M6. They generally lack *Sphagnum* spp., instead containing a range of other mosses typically including the base-indicators *Scorpidium scorpioides* and *Campylium stellatum*. There is a wide range of vascular plants including those indicative of mineral enrichment as well as many of those that occur in M6, on this site including variable mixes of e.g. dioecious sedge *Carex dioica*, tawny sedge *Carex hostiana*, flea sedge *Carex pulicaris*, yellow sedge *Carex demissa*, star sedge, common sedge, few-flowered spike-rush *Eleocharis quinqueflora*, common cottongrass, devil's-bit scabious *Succisa pratensis*, mat grass *Nardus stricta*, purple moor-grass, sweet vernal-grass *Anthoxanthum odoratum*, bulbous rush *Juncus bulbosus* and jointed rush *Juncus articulatus*. Very occasionally (in M10a within the broadleaved woodland above Loch Ness) there is also black bog-rush *Schoenus nigricans* in this vegetation, a species which has a more western distribution in Scotland. In the latter location there is also broad-leaved cottongrass *Eriophorum latifolium*, another base-indicator of local distribution; this species is also known to occur outside the survey area in large quantity in M10 vegetation on Ashie Moor and immediately south-west of Lochan an Eoin Ruadha. There is a small amount of M10a within the proposed headpond area, but it is more abundant near the old swampy mill pond in the north of the survey area, and on Ashie Moor.
- 6.3.30 A small amount of neutral sedge mire (denoted by 'MX') occurs in the far north of the survey area. This is akin to M23 neutral flush (see below), but without the large rushes, in that it lacks acidic indicators of M6 and base indicators of M10, but does contain a range of neutral species at high cover, such as common sedge, Yorkshire fog and the moss *Calliegonella cuspidata*.
- 6.3.31 Two other vegetation types occur within the survey area that are open (i.e. not woodland / scrub) and flushed to a degree, but which are generally considered to be wet heath or purple moor-grass grassland – these are M15a, M25c and M25x, which are discussed in the wet heath and grassland sections below.
- 6.3.32 Within the south-west part of the conifer plantation there are several elongated and more-or-less parallel depressions which have been referred to as basin mires. These contain a mix of bog communities and flush vegetation. The majority of the vegetation corresponds to M19a (see above) but there are significant amounts of M1, M6a and, in places, M10a with obvious base indicators including the moss *Scorpidium revolvens*. The M1 is locally rich with, in addition to *Sphagnum denticulatum*, *Sphagnum capillifolium* and *Sphagnum fallax*, a significant amount of the rather scarce mud sedge *Carex limosa*, along with a small amount of *Scorpidium scorpioides*.
- Mires – wet heaths and purple moor-grass mire**
- 6.3.33 All recorded wet heath constitutes forms of M15 (*Trichophorum germanicum* – *Erica tetralix* wet heath). M15 is quite variable in nature, and the majority of recorded wet heath within the

survey area is M15b (Typical sub-community). This is not very diverse and, on this site, often fairly dry for 'wet' heath (including parts of the proposed headpond area), with much heather and scattered purple moor-grass / cross-leaved heath, and often (but not always) variable amounts of deergrass. In places there is *Sphagnum capillifolium* (but no *Sphagnum papillosum* which normally indicates bog).

- 6.3.34 Far more notable is M15a, which is flushed wet heath containing small sedges such as carnation sedge *Carex panicea* and glaucous sedge *Carex flacca* amongst the species mentioned in the previous paragraph. Cross-leaved heath and purple moor-grass tend to be more abundant here. Of particular note is the fairly frequent occurrence of grass-of-parnassus *Parnassia palustris* in M15a on the open ground north-east of 'Park' farm, within which there are also small amounts of M10 basic flush.
- 6.3.35 Where ericoids are sparse or absent, but purple moor-grass is a dominant species, the vegetation is referable to M25 (*Molinia caerulea* – *Potentilla erecta* mire). Only small amounts of this vegetation type occur within the survey area, but this includes more notable flushed purple moor-grass. M25a (*Erica tetralix* sub-community) is the closest to wet heath (and is regarded as wet heath under the EUNIS¹ system), with sparsely scattered (sometimes very sparse) cross-leaved heath. It is species-poor with relatively few (often very few) associates, most commonly including tormentil. It can contain bog myrtle *Myrica gale*, but within the survey area this was largely confined to a small amount of M25a near Loch Ashie.
- 6.3.36 M25c (*Angelica sylvestris* sub-community) is an enriched form which was noted locally in open areas amongst the broadleaved woodland above Loch Ness. In this area, it is characterised by the frequency of devil's-bit scabious and (often) black bog-rush amongst the usually very tussocky purple moor-grass, typically with thinly scattered ericoids (heather and cross-leaved heath) and variable range of other associates such as meadow buttercup *Ranunculus acris*, angelica *Angelica sylvestris*, sneezewort, star sedge, Yorkshire fog, lady's-bedstraw *Galium verum* and occasionally juniper.
- 6.3.37 A sedge-rich form of M25 was noted in one location towards the north edge of the survey area, associated with other mires. This has been coded as 'M25x'. It is enriched to a degree, with a high cover of sedges (especially star sedge) in addition to the dominant purple moor-grass, and is related to M25c but ill-fitting that sub-community because of the absence of larger neutral herbs.

Dry heaths

- 6.3.38 The vast majority of dry heath with the survey area, including in the proposed headpond area, is H12 (*Calluna vulgaris* – *Vaccinium myrtillus* heath), one of the commonest heath types in Scotland. The majority is H12a (*Calluna vulgaris* sub-community), in which heather is generally dominant and there are abundant acid pleurocarpous mosses (in particular *Hylocomium splendens* and *Pleurozium schreberi*), and small amounts (sometimes sparse) of bilberry. A small amount of H12c (*Galium saxatile* – *Festuca ovina* sub-community) was also noted, in which acid grasses form a substantial part of the sward in addition to heather, most likely as a result of grazing.
- 6.3.39 Very locally, in particular in the burnt area near Lochan na Curra, acid pleurocarpous mosses are much reduced as well as the ericoids, with small amounts of regenerating heather. This has been referred to H9, a poorer type of dry heath.

¹ European Nature Information System

- 6.3.40 A very small amount of H10a (*Calluna vulgaris* – *Erica cinerea* heath, Typical sub-community) was also noted in the far northern edge of the survey area, in which heather is accompanied by bell heather rather than bilberry in vegetation which is otherwise similar to H12.

Neutral grasslands and rush-pasture

- 6.3.41 With the exception of MG6 (*Lolium perenne* – *Cynosurus cristatus* grassland), which represents agriculturally-improved species-poor pasture and is common in the farmed parts of the survey area, neutral grasslands are scarce.
- 6.3.42 MG5 (*Cynosurus cristatus* – *Centaurea nigra* grassland) is an unimproved lowland neutral grassland type that occurs in a strip parallel and close to Loch Ness. It is a rather scarce and (in this case, relatively) species-rich grassland type that corresponds to the general term 'species-rich lowland meadow', which has declined drastically across the UK since the Second World War owing primarily to agricultural intensification. This best area of this particular MG5, which corresponds to the 'standard' MG5a *Lathyrus pratensis* sub-community, is identified by the lack of rye-grass *Lolium* spp., reasonable diversity of herbs (including common knapweed *Centaurea nigra*, ribwort plantain *Plantago lanceolata*, red clover *Trifolium pratense*, yellow rattle *Rhinanthus minor* and, locally, lady's-mantle *Alchemilla* sp.), and high cover of those herbs. This area appears to be currently used for hay production, and is marked on Figure 6.1.1 as 'MG5a'. It is probably precisely because the area is being managed for hay production that MG5 exists here, since this is historically the archetypical management of MG5 lowland meadow. It should be noted however that this MG5 is not especially diverse, and would not pass the SSSI site condition monitoring assessment for this type of vegetation, nor the reduced thresholds applied to non-SSSI grasslands during an SNH-commissioned survey (Ref 4).
- 6.3.43 Just to the south of this MG5a, there is another strip marked as 'MG5a (p)', which denotes a poorer form of MG5a which is recognisably that community but where horse-grazing has reduced the diversity and abundance of herbs.
- 6.3.44 It is not uncommon, especially in upland fringes and crofting areas, to find short grassland which is neutral in character but which lacks the agricultural species of MG6 and the herb diversity of MG5. Such vegetation was observed from the edge of and within part of the property of the private house north of Lochan na Curra. It is labelled as 'FH', an abbreviation of *Festuca rubra* – *Holcus lanatus* grassland, a type not included in the original NVC volumes but described in Rodwell (2000; Ref 11) and Averis *et al* (2004; Ref 2). It is of no ecological note, being apparently dominated by common grasses such as Yorkshire fog, common bent and red fescue *Festuca rubra*, with apparently few herbs. It may represent an abandoned small field of pasture that is no longer grazed by livestock, a common situation in which this community can occur.
- 6.3.45 A small amount of MG1 (*Arrhenatherum elatius* grassland) was recorded above the Loch Ness woodland in close proximity to dense bracken. It is here of no particular note, with coarse grasses such as false oat-grass *Arrhenatherum elatius* and cocksfoot *Dactylis glomerata*, finer grasses such as common bent, and occasional common knapweed.
- 6.3.46 Very small amounts of damp neutral grassland were also observed, with tufted hair-grass and soft rush, corresponding to MG9 (*Holcus lanatus* – *Deschampsia cespitosa* grassland) and MG10 (*Holcus lanatus* – *Juncus effusus* rush-pasture). Both are species-poor and of no special note.

- 6.3.47 More diverse neutral rush-dominated vegetation is rare within the survey area, mainly comprising small patches of M23b (*Juncus effusus* / *acutiflorus* – *Galium palustre* rush-pasture, *Juncus effusus* sub-community). This is overwhelmingly dominated by soft rush, with abundant *Calliergonella cuspidata* in the moss layer, and a relatively small number of associates such as common sorrel *Rumex acetosa*, creeping buttercup, marsh violet and cuckoo-flower *Cardamine pratensis*. There is also one patch of M23a (*Juncus acutiflorus* sub-community) near 'Park' farm, which is dominated by sharp-flowered rush but also in this case contains a moderate quantity of bottle sedge *Carex rostrata*.

Acid grasslands

- 6.3.48 In general, levels of grazing which would sustain acid grassland, as opposed to heath, scrub or bracken, are not present outside of the livestock pastures in the survey area. However, there are small amounts of U4 and U5 acid grasslands. The former (*Festuca ovina* – *Agrostis capillaris* – *Galium saxatile* grassland) occurs very locally as the Typical sub-community (with typical acid grasses, tormentil, heath bedstraw *Galium saxatile*, occasional other herbs such as devil's-bit scabious and common dog-violet *Viola riviniana*, and pleurocarpous mosses such as *Rhytidiadelphus squarrosus* and *Pleurozium schreberi*), and also locally in the more neutral form U4b (*Holcus lanatus* – *Trifolium repens* sub-community). U5 (*Nardus stricta* – *Galium saxatile* grassland) also occurs very locally in small quantity, as the Typical sub-community, with typical acid grasses including mat grass *Nardus stricta*, tormentil and heath bedstraw.
- 6.3.49 Dense bracken is locally dominant and conforms to the U20 community, in which the bracken is typically underlaid by acid species, sometimes accompanied (especially along the forest track in the woodland above Loch Ness) by bluebell and honeysuckle, but with little or no *Rubus* spp. that would otherwise move the bracken community to W25. Most of the bracken is U20a including acid grassland species beneath it, but there is a small amount of U20b with an understorey including abundant ericoids such as heather, and rarely U20c with a very heavy bracken leaf litter.

Swamps and aquatic vegetation

- 6.3.50 Swamp vegetation is scarce within the survey area. The most extensive area of swamp, and also the most notable, is at the old mill pond towards the north edge of the survey area, downstream of the Glais na Ceardaich. That this is an old mill pond is evident from 1st Edition Ordnance Survey maps, and its original artificial nature is clear from the straight retaining embankment along the south-west edge. The pond is now silted-up to a large degree and is largely swamp with only a small proportion of open water. The majority of the swamp is S9 (*Carex rostrata* swamp), corresponding to the slightly richer S9b *Menyanthes trifoliata* – *Equisetum fluviatile* sub-community, in which the dominant bottle sedge is accompanied by species such as water horsetail, bog-bean *Menyanthes trifoliata* and, in places, bog pondweed. A small part of the swamp is S14a (*Sparganium erectum* swamp, *Sparganium erectum* sub-community) with dense bur-reed *Sparganium erectum*. The most notable aspect, however, is the transition eastwards to M10a basic flush with abundant dioecious sedge and few-flowered spikerush over the silt. Both M10a and flushed wet heath (M15a) occur around the southern and eastern sides of this pond.
- 6.3.51 Also notable in the vicinity of this swampy pond is the occurrence of abundant stonewort (stoneworts are difficult to identify but this is probably *Chara virgata*) in both the inflowing

and outflowing streams. Stoneworts often indicate base-enrichment (as also demonstrated by the nearby M10 basic flushes).

- 6.3.52 Small quantities of species-poor bottle sedge swamp (S9a), in which there is little other than bottle sedge and (in this case) bulbous rush, are present along the southern shore of Loch Ashie. The stony substrate of the shallow open water of Loch Ashie itself contains abundant shoreweed *Littorella uniflora* corresponding to the A22 *Littorella uniflora* – *Lobelia dortmanna* community, a common aquatic community of shallow oligotrophic Scottish waters that also occurs at Lochan na Eoin Rudha.
- 6.3.53 There is little other swamp and aquatic vegetation in the survey area. One further location is a narrow, linear and seasonally-inundated waterbody in the south-west part of the conifer plantation. During the summer of 2018 this waterbody dried out completely, and it appears likely that it commonly does so. The entire substrate is vegetated, in particular with bulbous rush and floating club-rush *Eleogiton fluitans*, which corresponds to the A24 *Juncus bulbosus* community. Also present within the A24 are bog pondweed, lesser spearwort *Ranunculus flammula*, velvet bent *Agrostis canina* and marsh bedstraw *Galium palustre*. A minority of the waterbody contains shoreweed and common spikerush *Eleocharis palustris*, corresponding to S19b (*Eleocharis palustris* swamp, *Littorella uniflora* sub-community).
- 6.3.54 A very small amount of swamp-like vegetation corresponding to S27 (*Carex rostrata* – *Comarum palustre* tall-herb fen) occurs on the part of Ashie Moor within the survey area, where it corresponds to the wetter S27a *Carex rostrata* – *Equisetum fluviatile* sub-community. This vegetation is transitional between swamp proper and dry land, and in this case has characteristics of both M23 and S9 in that bottle sedge tends to dominate but there is a more defined moss layer and M23 species such as soft rush and (in this case) mint *Mentha* sp. occur. A very small amount of the drier sub-community S27b *Lysimachia* sub-community was also recorded towards the north edge of the survey area, in which bottle sedge is accompanied by common sedge, the moss *Calliergonella cuspidata* and a variety of species mainly allied to M23 such as soft rush, Yorkshire fog, marsh violet and fen bedstraw *Galium uliginosum*; similar vegetation occurs in a small patch within the south-west part of the conifer plantation.

Other vegetation

- 6.3.55 Very small amounts of species-poor disturbed weed communities with common nettle *Urtica dioica* and rosebay willowherb *Chamerion angustifolium* occur within the survey area, corresponding to OV25 and OV27.

6.4 GWDTs and Peat

- 6.4.1 The UK Technical Advisory Group (UKTAG) for the Water Framework Directive uses the NVC as a basis for identifying Groundwater-Dependent Terrestrial Ecosystems (GWDTs), classifying NVC types as having (or potentially having, depending on hydrogeological setting) high, moderate or low groundwater dependency. This categorisation of NVC types is summarised in Appendix 4 of SEPA Guidance Note 31 (Ref 12). SEPA require effects on GWDTs to be avoided as far as possible.
- 6.4.2 Blanket (and raised) bog NVC types are predominantly ombrotrophic (rain-water fed) and therefore have low groundwater dependency. However, they are normally underlain by significant amounts of peat. In addition to the ecological value of peat bog habitat, peat also has substantial carbon sequestration value. Thus there is a presumption in planning policy

against damaging peatland, and where peat will be impacted consideration of peat management is required. Areas dominated by NVC blanket bog types (in this case M17, M19 and locally M20, including component pools and runnels of M1 and M2) are clearly identified in Figure 6.1.1 by the underlying purple habitat colouration (solid or hatched). Such blanket bog vegetation occurs in patches within the headpond area, to a lesser extent within the conifer plantation, and in very much greater extent on Ashie Moor and around and beyond Lochan na Curra and Lochan an Eoin Ruadha. Note that peat depth measurements and interpolations are discussed in Chapter 5 and shown in Figures 5.5 and 5.6 of the EIA Report.

- 6.4.3 Most other (i.e. non-bog) NVC mire types (M5–M16 and M21–M38) have (potentially) high or moderate groundwater dependency, as do wet or flushed woodlands (W1–W7), damp grasslands (MG4, MG8–MG11, CG10–CG12, U6, U15), tall herb communities (U16, U17), certain swamps and tall-herb fens (S2, S3, S7, S11, S24, S25, S27), and dune slack communities (SD13–SD17).
- 6.4.4 Within the survey area, potentially high groundwater dependency GWDTEs occur as follows:
- W7 flushed woodland as a minor mosaic component of the ancient broadleaved woodland on the slopes above Loch Ness;
 - Small patches of W4 in the proposed headpond area, and in the northern edge of the survey area by Loch Ashie and in the wild area around Glaic na Ceardaich;
 - M6 flushes scattered through the proposed headpond area, the south-west part of the conifer plantation, near Cnoc Liath, and on Ashie Moor;
 - M10 basic flushes present very locally within the proposed headpond area, near Cnoc Liath, and within the ancient woodland above Loch Ness;
 - M23 (and very locally MX neutral sedge mire) neutral flushes found very locally on Ashie Moor, within the south-west part of the conifer plantation, and near Glaic na Ceardaich;
- 6.4.5 Potentially moderate groundwater dependency GWDTEs occur as follows (some of these may in fact have high groundwater dependency as discussed below):
- M15 wet heath, present extensively in the proposed headpond area and north-east of Park farm; also present in small quantity within the woodland above Loch Ness (note that M15a at the two latter locations may have high groundwater dependency because this sub-community is flushed unlike the more species-poor M15b; the flushed M15a with grass-of-parnassus north-east of Park farm is particularly notable);
 - M25 purple moor-grass mire, present in small quantity in the woodland above Loch Ness and very locally elsewhere (note that the M25 above Loch Ness is M25c which, since it is clearly flushed with e.g. black bog-rush, may in fact have high groundwater dependency);
 - S27 tall-herb fen, which occurs very locally on Ashie Moor and in the south-west part of the conifer plantation;
 - MG9 and MG10 damp grasslands, which occur very locally in small quantity within the survey area, but are however of very low ecological interest.
- 6.4.6 The locations of GWDTEs within the survey area are shown on Figure 6.1.3: GWDTEs and Peat Bog.

6.5 Juniper and Veteran Pines

- 6.5.1 During the survey a small number of veteran Scots pine trees were noted. These are clearly older than the conifer plantation in which they occur, with multiple low and complex branching instead of straight stems of the commercially-planted trees. These veteran trees are considerably older than the plantation and have clearly been retained during previous forestry operations. The locations of these veteran pines are shown in Figure 6.1.4.
- 6.5.2 Figure 6.1.4 also shows the locations of the majority of juniper observed during both the NVC survey and other surveys. Most juniper is either mixed in with gorse on Ashie Moor, or present as widely scattered bushes. Only one patch of juniper was considered to correspond to the juniper woodland NVC type (W19), in an open ride in the ancient woodland above Loch Ness; this does not however detract from the importance of juniper scrub elsewhere in the survey area, since this is a highly localised species in Scotland.

6.6 References

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- Ref 4. Dadds NJ and Averis ABG (2014). *The extent and condition of non-designated species-rich lowland grasslands in Scotland*. Scottish Natural Heritage Commissioned Report No. 571.
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- Ref 12. SEPA (2017). *Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems*. Land Use Planning System SEPA Guidance Note 31. Scottish Environmental Protection Agency.
- Ref 13. Stace C (2010). *New Flora of the British Isles* (3rd edition). Cambridge University Press, Cambridge.

Annex 6.1.1: Quadrat Data

6.1 Overview

6.1.1 This annex contains data from fifteen sample quadrats, which are intended to demonstrate surveyor competence and give examples of various NVC types. In the following quadrat data, the numbers adjacent to species refer to their cover within each quadrat according to the Domin scale. This scale is a commonly-used quantitative measure of plant abundance in a sample, where an estimation is made of the percentage cover of the living above-ground plant parts. There are ten divisions in the Domin scale, with break-points (bold) at well-understood fractions:

- 1,2,3 < 4 % cover; one or two, several or many plants respectively;
- 4 4-**10** % cover;
- 5 11-**25** % cover;
- 6 26-**33** % cover;
- 7 34-**50** % cover;
- 8 51-**75** % cover;
- 9 76-**90** % cover;
- 10 > 90 % cover.

W4b

Grid reference (full)	NH61613458				Date	20/07/2018			
Grid reference error	+ / -		5	m	Habitat description Include soil type / depth if known, general vegetation condition, and any management issues				
Quadrat reference				9					
Photo reference				n/a					
Slope (approx. degrees)				flat					
Aspect (e.g. N, NE, flat)									
Quadrat size	10	x	10	m		W4b wet woodland, mainly of birch, small patch in otherwise open area of heath and flush			
Layers - mean height trees, shrubs, field layer, mosses	5	m		m					
	50	cm	15	mm					
Layers - total cover trees, shrubs, field layer, mosses	70	%		%					
	70	%	20	%					
Species	Domin				Species	Domin			
Bare soil									
Bare rock									
Open water									
Leaf litter (if significant)									
Betula pubescens	9								
Salix aurita	2								
Molinia caerulea	7								
Juncus effusus	5								
Holcus mollis	4								
Viola palustris	3								
Cirsium palustre	3								
Erica tetralix	3								

W9a

Grid reference (full)	NH58783314				Date	19/07/2018			
Grid reference error	+ / -		5	m	Habitat description Include soil type / depth if known, general vegetation condition, and any management issues				
Quadrat reference				10					
Photo reference				n/a					
Slope (approx. degrees)				8					
Aspect (e.g. N, NE, flat)				NW					
Quadrat size		x		m		W9a woodland. Quadrat size: 50x50m for canopy, 10x10m for woodland floor. Part of extensive broadleaved ancient woodland above Loch Ness			
Layers - mean height trees, shrubs, field layer, mosses	15	m		m					
	20	cm	4	mm					
Layers - total cover trees, shrubs, field layer, mosses	99	%		%					
	80	%	10	%					
Species	Domin				Species	Domin			
Bare soil	4								
Bare rock									
Open water									
Leaf litter (if significant)	4								
Fraxinus excelsior	6								
Corylus avellana	6								
Betula pubescens	2								
Alnus glutinosa	2								
Brachypodium sylvaticum	5								
Bromopsis ramosa	3								
Deschampsia cespitosa	4								
Geum urbanum	4								
Circaea x intermedia	3								
Dryopteris dilatata	3								
Pteridium aquilinum	4								
Blechnum spicant	3								
Thuidium tamariscum	4								
Oxalis acetosella	4								
Sanicula europaea	4								
Lysimachia nemorum	1								
Carex remota	2								
Geranium robertianum	1								
Dryopteris affinis agg.	1								

W11b

Grid reference (full)	NH58993309				Date	20/07/2018			
Grid reference error	+ / -		5	m	Habitat description Include soil type / depth if known, general vegetation condition, and any management issues				
Quadrat reference				11					
Photo reference				n/a					
Slope (approx. degrees)				10					
Aspect (e.g. N, NE, flat)				NW					
Quadrat size		x		m		W11b woodland. Quadrat size: 50x50m for canopy, 10x10m for woodland floor. Part of extensive broadleaved ancient woodland above Loch Ness.			
Layers - mean height trees, shrubs, field layer, mosses	11	m		m					
	25	cm	5	mm					
Layers - total cover trees, shrubs, field layer, mosses	75	%		%					
	80	%	40	%					
Species	Domin				Species	Domin			
Bare soil									
Bare rock									
Open water									
Leaf litter (if significant)									
Betula pendula	5								
Betula pubescens	8								
Corylus avellana	5								
Sorbus aucuparia	3								
Ilex aquifolium	3								
Anthoxanthum odoratum	6								
Deschampsia cespitosa	4								
Holcus mollis	5								
Oxalis acetosella	4								
Potentilla erecta	3								
Pteridium aquilinum	3								
Rhytiadelphus squarrosus	5								
Pseudoscleropodium purum	3								
Blechnum spicant	4								
Hyacinthoides non-scripta	3								
Anemone nemorosa	1								

W17b

Grid reference (full)	NH60803444				Date	21/07/2018			
Grid reference error	+ / -		5	m	Habitat description Include soil type / depth if known, general vegetation condition, and any management issues				
Quadrat reference				12					
Photo reference				n/a					
Slope (approx. degrees)				6					
Aspect (e.g. N, NE, flat)				SW					
Quadrat size		x		m		W17b woodland. Quadrat size: 50x50m for canopy, 10x10m for woodland floor. Part of extensive mainly birch woodland in wild area at north of survey area, with pockets of heath, bracken and flush.			
Layers - mean height trees, shrubs, field layer, mosses	8	m	2	m					
	50	cm	5	mm					
Layers - total cover trees, shrubs, field layer, mosses	50	%	5	%					
	65	%	25	%					
Species	Domin				Species	Domin			
Bare soil									
Bare rock									
Open water									
Leaf litter (if significant)									
Betula pubescens	7								
Calluna vulgaris	7								
Sorbus aucuparia	4								
Vaccinium myrtillus	5								
Hylocomium splendens	4								
Anthoxanthum odoratum	3								
Dicranum scoparium	5								
Juniperus communis	2								
Pteridium aquilinum	6								

M1

Grid reference (full)	NH60513273		Date	19/07/2018	
Grid reference error	+ / -	5	Habitat description	Include soil type / depth if known, general vegetation condition, and any management issues M1 bog pool. Pools dried up due to recent dry conditions.	
Quadrat reference		1			
Photo reference		n/a			
Slope (approx. degrees)		n/a			
Aspect (e.g. N, NE, flat)		W			
Quadrat size	2	x	2		m
Layers - mean height		m			m
trees, shrubs, field layer, mosses	5	cm	5		mm
Layers - total cover	0	%	0		%
trees, shrubs, field layer, mosses	35	%	10		%
Species	Domin		Species	Domin	
Bare soil	7				
Bare rock	0				
Open water	0				
Leaf litter (if significant)	0				
Potamogeton polygonifolius	4				
Carex limosa	4				
Menyanthes trifoliata	5				
Juncus bulbosus	3				
Sphagnum denticulatum	4				
Equisetum fluviatile	4				
Erica tetralix	4				
Eriophorum angustifolium	2				
Narthecium ossifragum	3				

M6a

Grid reference (full)	NH61083312				Date	20/07/2018			
Grid reference error	+ / -		5	m	Habitat description Include soil type / depth if known, general vegetation condition, and any management issues				
Quadrat reference				2					
Photo reference				n/a					
Slope (approx. degrees)				2					
Aspect (e.g. N, NE, flat)				SW					
Quadrat size	2	x	2	m		M6a with high cover of Molinia purpurea			
Layers - mean height		m		m					
trees, shrubs, field layer, mosses	45	cm	8	mm					
Layers - total cover		%		%					
trees, shrubs, field layer, mosses	99	%	30	%					
Species	Domin				Species	Domin			
Bare soil	0								
Bare rock	0								
Open water	0								
Leaf litter (if significant)	0								
Carex echinata	8								
Carex nigra	5								
Molinia caerulea	8								
Potentilla erecta	4								
Juncus effusus	3								
Sphagnum palustre	5								
Viola palustris	2								
Eriophorum angustifolium	4								
Carex panicea	2								
Carex hostiana	2								
Narthecium ossifragum	2								
Cirsium palustre	3								
Aulacomnium palustre	4								

M10a

Grid reference (full)	NH60353408				Date	04/09/2018			
Grid reference error	+ / -		4	m	Habitat description Include soil type / depth if known, general vegetation condition, and any management issues				
Quadrat reference				14					
Photo reference				n/a					
Slope (approx. degrees)				1					
Aspect (e.g. N, NE, flat)				N					
Quadrat size	2	x	2	m		M10a basic flush, high species diversity, ungrazed except for deer and located between small Sitka spruce blocks. Notable for presence of Eriophorum latifolium. Other parts of flush contained other species not in quadrat e.g. Eleocharis quinqueflora, also a base-indicator.			
Layers - mean height trees, shrubs, field layer, mosses		m		m					
	15	cm	5	mm					
Layers - total cover trees, shrubs, field layer, mosses		%		%					
	90	%	75	%					
Species	Domin				Species	Domin			
Bare soil	0				Potentilla erecta	2			
Bare rock	0				Selaginella selaginoides	1			
Open water	0				Nartheicum ossifragum	1			
Leaf litter (if significant)	0								
Carex demissa	2								
Carex panicea	2								
Carex hostiana	2								
Carex dioica	5								
Carex echinata	2								
Eriophorum latifolium	5								
Drosera rotundifolia	1								
Juncus bulbosus	7								
Holcus lanatus	2								
Molinia caerulea	4								
Potamogeton polygonifolius	4								
Campyllum stellatum	8								
Scorpidium revolvens	4								
Pinguicula vulgaris	1								
Sphagnum palustre	3								
Agrostis canina	2								
Succisa pratensis	1								
Juncus articulatus	2								
Anthoxanthum odoratum	2								
Erica tetralix	1								

M15a

Grid reference (full)	NH59043308				Date	19/07/2018			
Grid reference error	+ / -		5	m	Habitat description Include soil type / depth if known, general vegetation condition, and any management issues Flushed M15a wet heath, with base-rich influence, adjacent to M10a				
Quadrat reference				3					
Photo reference				n/a					
Slope (approx. degrees)				15					
Aspect (e.g. N, NE, flat)				NW					
Quadrat size	2	x	2	m					
Layers - mean height				m					
trees, shrubs, field layer, mosses	40	cm	10	mm					
Layers - total cover				%					
trees, shrubs, field layer, mosses	60	%	20	%					
Species	Domin				Species	Domin			
Bare soil	0								
Bare rock	2								
Open water	0								
Leaf litter (if significant)	0								
Molinia caerulea	7								
Erica tetralix	5								
Trichophorum germanicum agg.	6								
Calluna vulgaris	3								
Potentilla erecta	3								
Narthecium ossifragum	5								
Eriophorum angustifolium	3								
Myrica gale	2								
Carex echinata	5								
Carex panicea	3								
Carex hostiana	3								
Carex pulicaris	1								
Schoenus nigricans	4								
Carex demissa	4								
Sphagnum capillifolium	1								
Pleurozium schreberi	3								

M15b

Grid reference (full)	NH60123294				Date	19/07/2018			
Grid reference error	+	-	5	m	Habitat description Include soil type / depth if known, general vegetation condition, and any management issues M15b wet heath community, fairly dry, with high cover of Trichophorum germanicum possibly resulting from historic burning.				
Quadrat reference			4						
Photo reference				n/a					
Slope (approx. degrees)				7					
Aspect (e.g. N, NE, flat)				NW					
Quadrat size	2	x	2	m					
Layers - mean height trees, shrubs, field layer, mosses		m	0.4	m					
	30	cm	8	mm					
Layers - total cover trees, shrubs, field layer, mosses		%	10	%					
	80	%	20	%					
Species	Domin				Species	Domin			
Bare soil	0								
Bare rock	2								
Open water	0								
Leaf litter (if significant)	0								
Molinia caerulea	3								
Erica tetralix	3								
Trichophorum germanicum agg.	8								
Calluna vulgaris	8								
Potentilla erecta	4								
Narthecium ossifragum	1								
Eriophorum angustifolium	1								
Carex binervis	2								
Carex echinata	5								
Cladonia sp.	3								
Erica cinerea	3								

M15b (2)

Grid reference (full)	NH61113310				Date	21/07/2018			
Grid reference error	+ / -		6	m	Habitat description Include soil type / depth if known, general vegetation condition, and any management issues				
Quadrat reference				8					
Photo reference				n/a					
Slope (approx. degrees)				o					
Aspect (e.g. N, NE, flat)				flat					
Quadrat size	2	x	2	m		Drier form of M15b wet heath, approaching H12a dry heath but with Erica tetralix, characteristic of wet heath, and often (not in this quadrat) sparse Molinia purpurea.			
Layers - mean height trees, shrubs, field layer, mosses		m		m					
	45	cm	8	mm					
Layers - total cover trees, shrubs, field layer, mosses		%		%					
	88	%	25	%					
Species	Domin				Species	Domin			
Bare soil									
Bare rock									
Open water									
Leaf litter (if significant)									
Calluna vulgaris	9								
Erica cinerea	4								
Erica tetralix	4								
Vaccinium myrtillus	6								
Hylocomium splendens	5								
Hypnum cupressiforme	5								
Galium saxatile	4								
Potentilla erecta	4								

M17a

Grid reference (full)	NH60363288				Date	20/07/2018			
Grid reference error	+ / -		5	m	Habitat description Include soil type / depth if known, general vegetation condition, and any management issues				
Quadrat reference			5						
Photo reference				n/a					
Slope (approx. degrees)				0					
Aspect (e.g. N, NE, flat)				flat					
Quadrat size	2	x	2	m		M17a blanket bog on Ashie Moor. Subject at times to cattle grazing.			
Layers - mean height trees, shrubs, field layer, mosses		m		m					
	35	cm	10	mm					
Layers - total cover trees, shrubs, field layer, mosses		%		%					
	90	%	40	%					
Species	Domin				Species	Domin			
Bare soil	0								
Bare rock	0								
Open water	0								
Leaf litter (if significant)	0								
Eriophorum vaginatum	8								
Trichophorum germanicum agg.	5								
Erica tetralix	4								
Sphagnum papillosum	5								
Sphagnum palustre	4								
Sphagnum capillifolium	4								
Narthecium ossifragum	4								
Potamogeton polygonifolius	3								
Calluna vulgaris	4								
Carex echinata	4								
Sphagnum cuspidatum	3								

M19b

Grid reference (full)	NH61263323				Date	21/07/2018			
Grid reference error	+ / -		5	m	Habitat description Include soil type / depth if known, general vegetation condition, and any management issues M19b blanket bog, fairly dry and dominated by <i>Calluna vulgaris</i> and <i>Eriophorum vaginatum</i> . Ungrazed except by deer.				
Quadrat reference				6					
Photo reference				n/a					
Slope (approx. degrees)				0					
Aspect (e.g. N, NE, flat)									
Quadrat size	2	x	2	m					
Layers - mean height				m					
trees, shrubs,									
field layer, mosses	45	cm	5	mm					
Layers - total cover				%					
trees, shrubs,				%					
field layer, mosses	90	%	25	%					
Species	Domin				Species	Domin			
Bare soil									
Bare rock									
Open water									
Leaf litter (if significant)									
<i>Calluna vulgaris</i>	8								
<i>Eriophorum vaginatum</i>	7								
<i>Hylocomium splendens</i>	6								
<i>Hypnum jutlandicum</i>	4								
<i>Pleurozium schreberi</i>	4								
<i>Erica cinerea</i>	3								
<i>Sphagnum capillifolium</i>	3								
<i>Vaccinium myrtillus</i>	3								
<i>Erica tetralix</i>	4								

H10a

Grid reference (full)	NH60323291				Date	21/07/2018			
Grid reference error	+ / -		5	m	Habitat description Include soil type / depth if known, general vegetation condition, and any management issues				
Quadrat reference				7					
Photo reference				n/a					
Slope (approx. degrees)				4					
Aspect (e.g. N, NE, flat)				NW					
Quadrat size	2	x	2	m		H10a dry heath, on a drier and south-facing knoll on shallow soil. H12a is more typical across the site, lacking the <i>Erica cinerea</i> but with <i>Vaccinium myrtillus</i> - sometimes sparse - and large pleurocarpous mosses.			
Layers - mean height trees, shrubs, field layer, mosses		m		m					
	40	cm	10	mm					
Layers - total cover trees, shrubs, field layer, mosses	80	%	30	%					
Species	Domin				Species	Domin			
Bare soil									
Bare rock									
Open water									
Leaf litter (if significant)									
<i>Calluna vulgaris</i>	8								
<i>Erica cinerea</i>	6								
<i>Carex binervis</i>	3								
<i>Potentilla erecta</i>	4								
<i>Diplophyllum albicans</i>	4								
<i>Trichophorum germanicum</i> agg.	3								
<i>Pleurozium schreberi</i>	6								

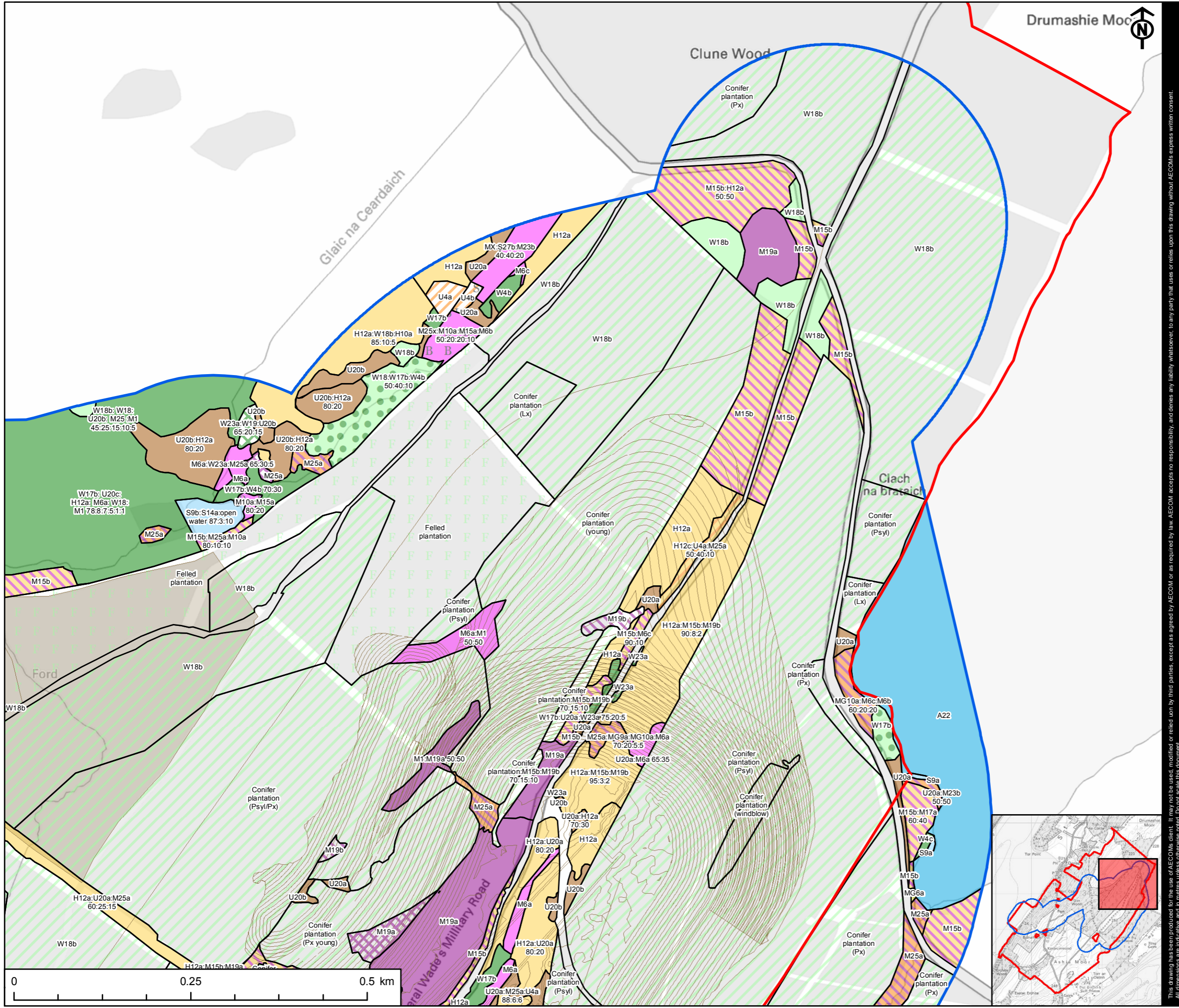
MG5a

Grid reference (full)	NH58883340				Date	19/07/2018			
Grid reference error	+ / -		5	m	Habitat description Include soil type / depth if known, general vegetation condition, and any management issues				
Quadrat reference				13					
Photo reference				n/a					
Slope (approx. degrees)				o					
Aspect (e.g. N, NE, flat)				flat					
Quadrat size	2	x	2	m		MG5a neutral grassland. This part has been grazed by horses by field in general appears to be used for hay production. Reasonably but not especially diverse for MG5 - not of SSSI standard.			
Layers - mean height trees, shrubs, field layer, mosses		m		m					
	10	cm	2	mm					
Layers - total cover trees, shrubs, field layer, mosses		%		%					
	95	%	25	%					
Species	Domin				Species	Domin			
Bare soil	0				Rhytidiadelphus squarrosus	5			
Bare rock	0								
Open water	0								
Leaf litter (if significant)	0								
Cynosurus cristatus	5								
Anthoxanthum odoratum	7								
Holcus lanatus	7								
Deschampsia cespitosa	4								
Centaurea nigra	5								
Trifolium repens	4								
Trifolium pratense	4								
Lathyrus pratensis	3								
Lotus corniculatus	2								
Lolium perenne	2								
Bellis perennis	3								
Prunella vulgaris	4								
Ranunculus repens	2								
Ranunculus acris	4								
Rumex acetosa	1								
Rhinanthus minor	2								
Poa trivialis	2								
Filipendula ulmaria	1								
Achillea millefolium	1								
Plantago lanceolata	5								

S27b

Grid reference (full)	NH61593460				Date	05/09/2018			
Grid reference error	+ / -		4	m	Habitat description Include soil type / depth if known, general vegetation condition, and any management issues				
Quadrat reference				14					
Photo reference				n/a					
Slope (approx. degrees)				0					
Aspect (e.g. N, NE, flat)				flat					
Quadrat size	2	x	2	m		S27b, drier form with similarity to M23 but with abundant <i>Carex rostrata</i> and some <i>Comarum palustre</i> , ungrazed apart from deer. <i>Hylocomium splendens</i> present as a raised hummock which support the <i>Galium saxatile</i> , species uncharacteristic of this vegetation type.			
Layers - mean height trees, shrubs, field layer, mosses		m		m					
	45	cm	10	mm					
Layers - total cover trees, shrubs, field layer, mosses		%		%					
	90	%	90	%					
Species	Domin				Species	Domin			
Bare soil	0								
Bare rock	0								
Open water	0								
Leaf litter (if significant)	0								
<i>Cirsium palustre</i>	2								
<i>Epilobium palustre</i>	2								
<i>Carex rostrata</i>	6								
<i>Anthoxanthum odoratum</i>	2								
<i>Carex nigra</i>	7								
<i>Holcus lanatus</i>	5								
<i>Deschampsia cespitosa</i>	6								
<i>Calligonella cuspidata</i>	8								
<i>Comarum palustre</i>	5								
<i>Galium uliginosum</i>	3								
<i>Poa pratensis</i>	2								
<i>Juncus effusus</i>	4								
<i>Potentilla erecta</i>	2								
<i>Hylocomium palustre</i>	5								
<i>Galium saxatile</i>	2								
<i>Viola palustris</i>	4								

Figures



PROJECT
 RED JOHN PUMPED STORAGE HYDRO

CLIENT
 ILI (Highlands PSH) Ltd.

KEY

- Development Site boundary
- Above ground infrastructure - 250m buffer
- Above ground infrastructure - Line
- Above ground infrastructure - Area
- NVC areas

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- S = Swamp
- A = Aquatic vegetation
- OV = Open Vegetation (includes stands of weeds)

Where vegetation does not correspond to a published NVC community, a very brief description is given (e.g. 'Conifer plantation'; 'Open water'; 'Quarry'). Note that if conifer plantation is Scots pine and it has a heathy ground flora then it does constitute an NVC type (W18).

Multiple NVC types are listed if a polygon is a mosaic. The numbers following the NVC types indicate estimated percentage proportions of the mosaic components.

The NVC types are described in Appendix 6.1.

TITLE
 FIGURE 6.1.1
 NATIONAL VEGETATION CLASSIFICATION

REFERENCE
 RJ_181031_EIA_A6.1.1_v1

SHEET NUMBER 1 of 5 **DATE** 31/10/18

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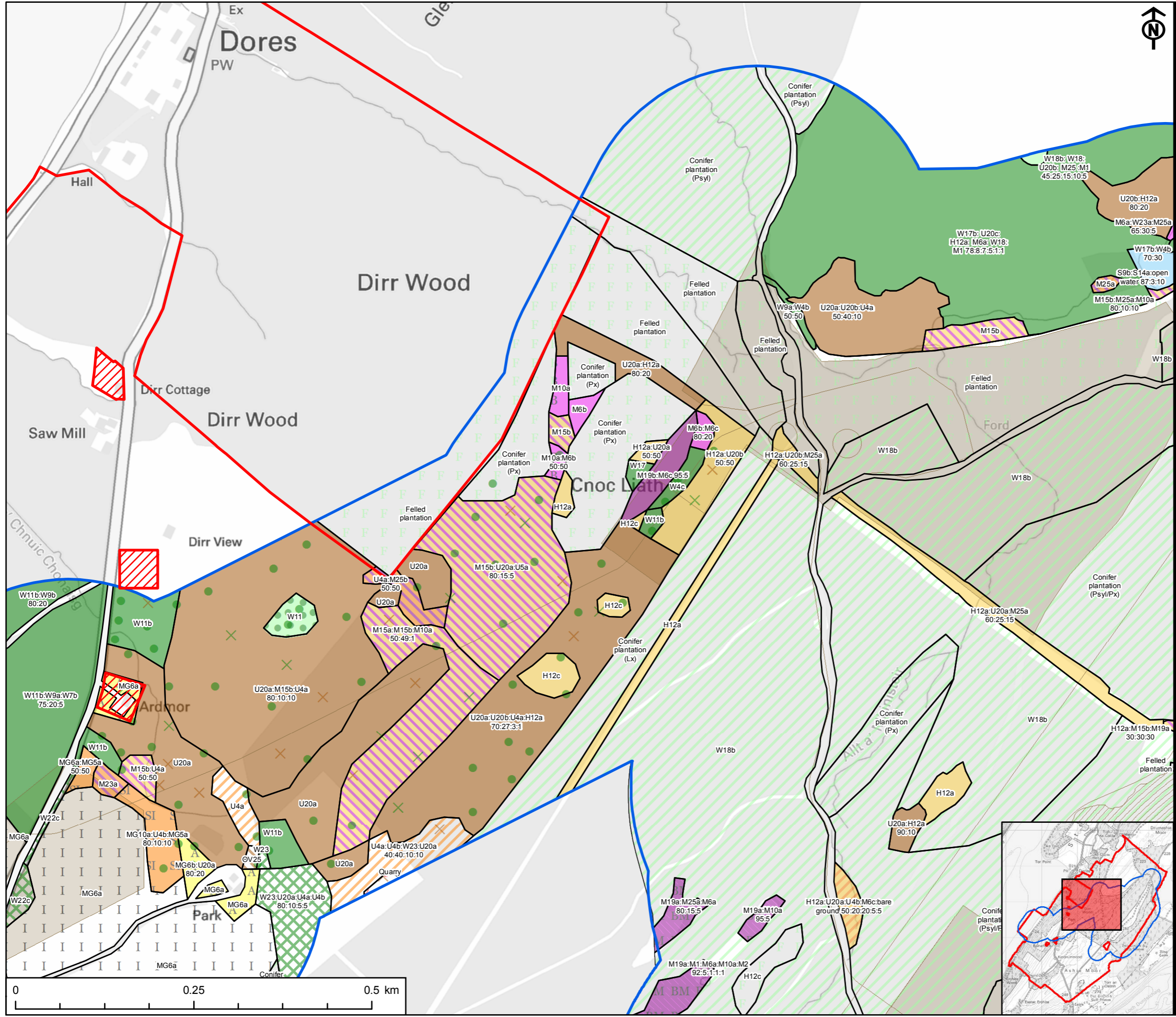
TITLE
FIGURE 6.1.1
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SHEET NUMBER DATE
2 of 5 31/10/18

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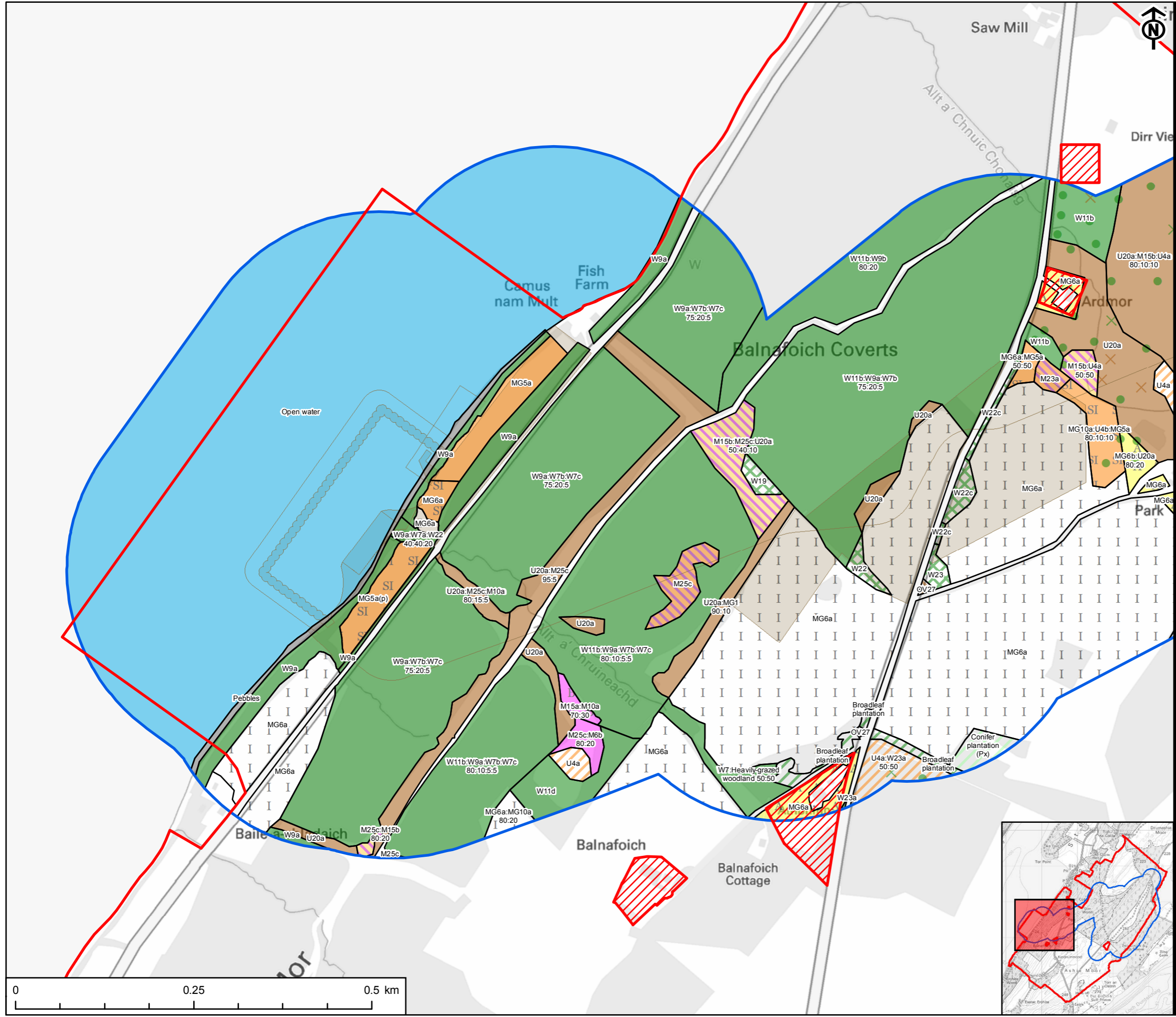
TITLE
FIGURE 6.1.1
NATIONAL VEGETATION CLASSIFICATION

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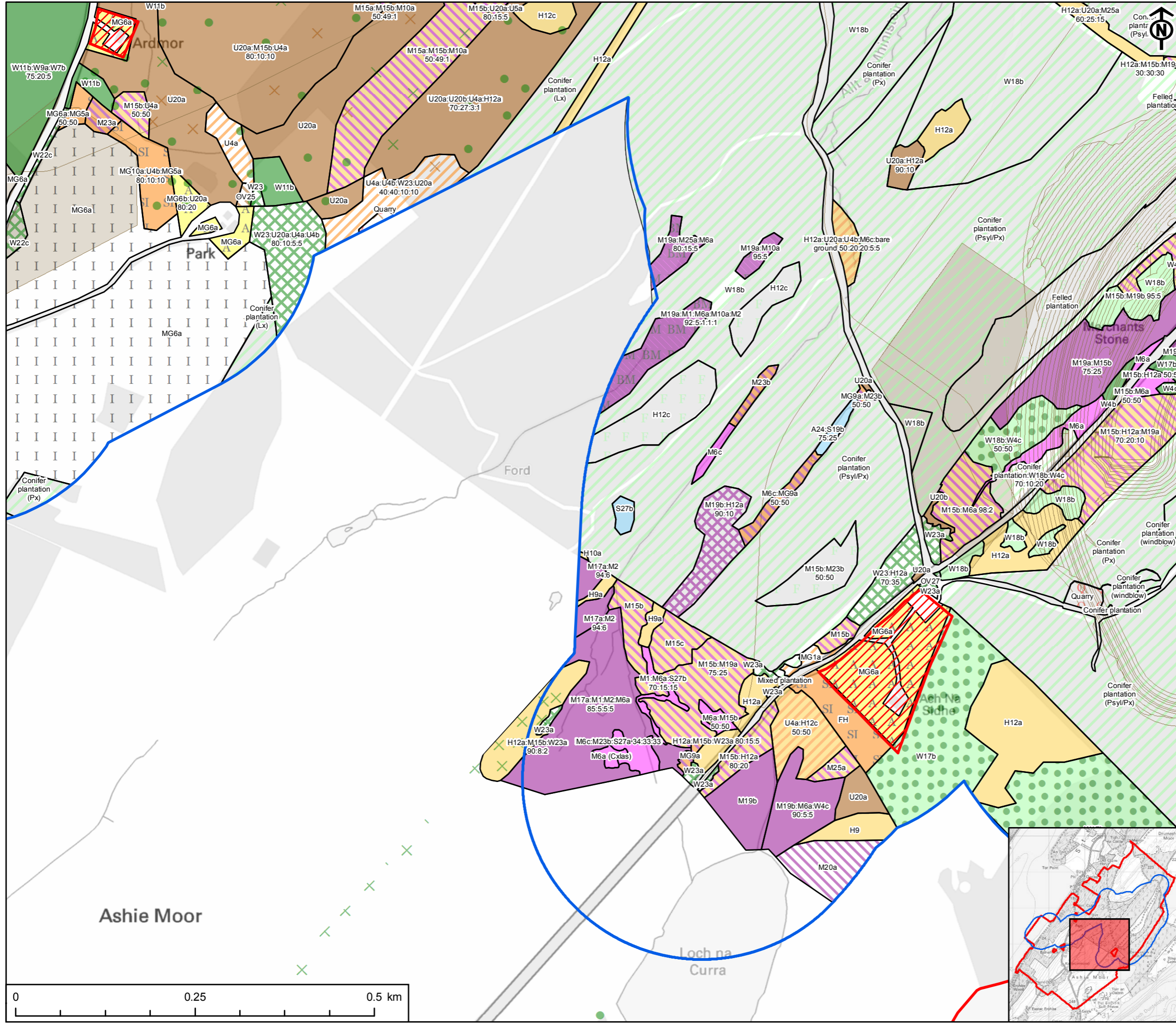
TITLE
FIGURE 6.1.1
NATIONAL VEGETATION CLASSIFICATION

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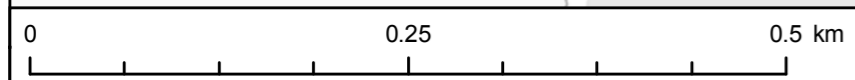
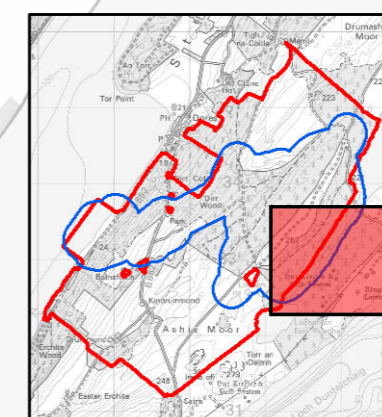
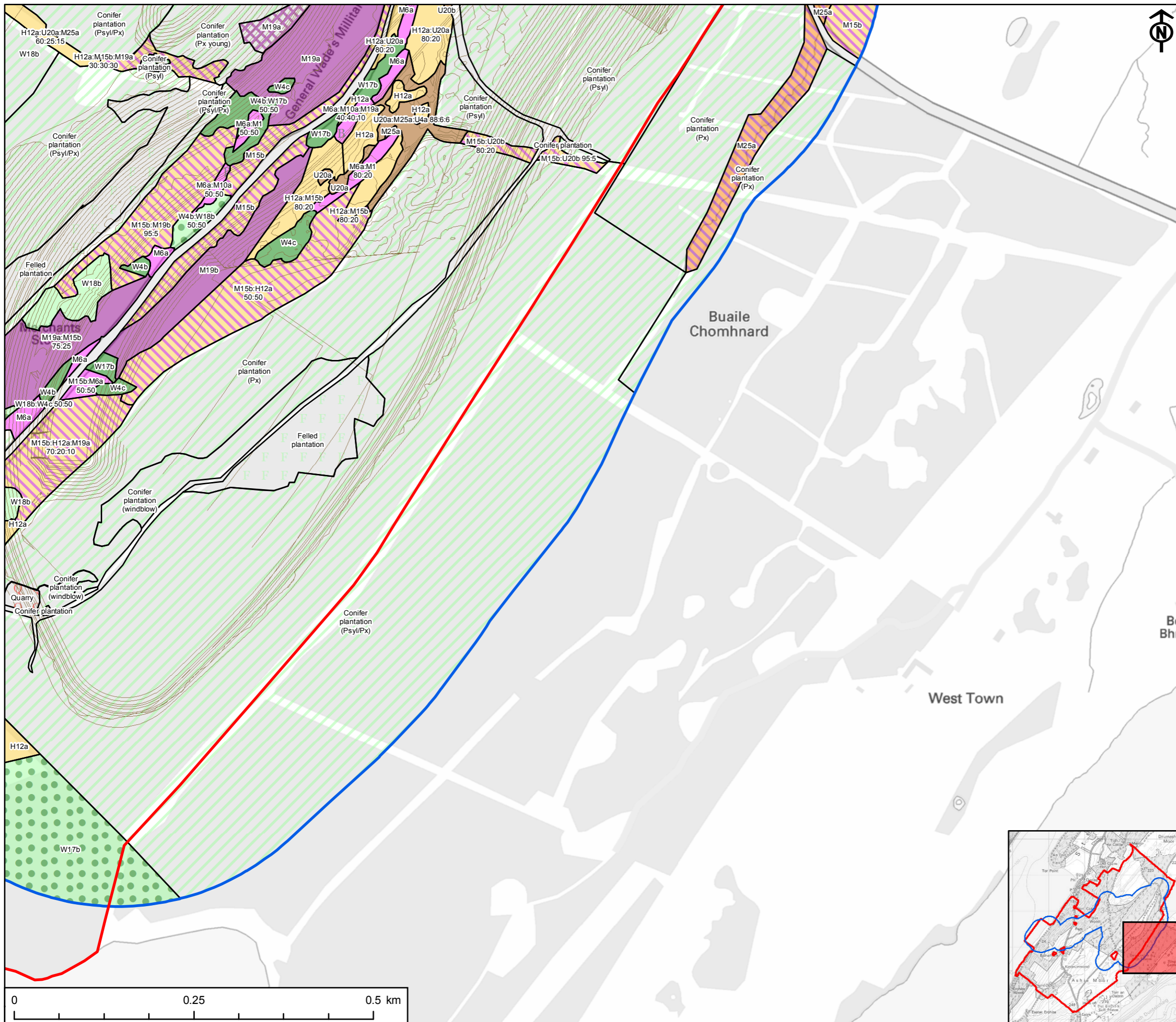
TITLE
FIGURE 6.1.1
NATIONAL VEGETATION CLASSIFICATION

REFERENCE
RJ_181031_EIA_A6.1.1_v1

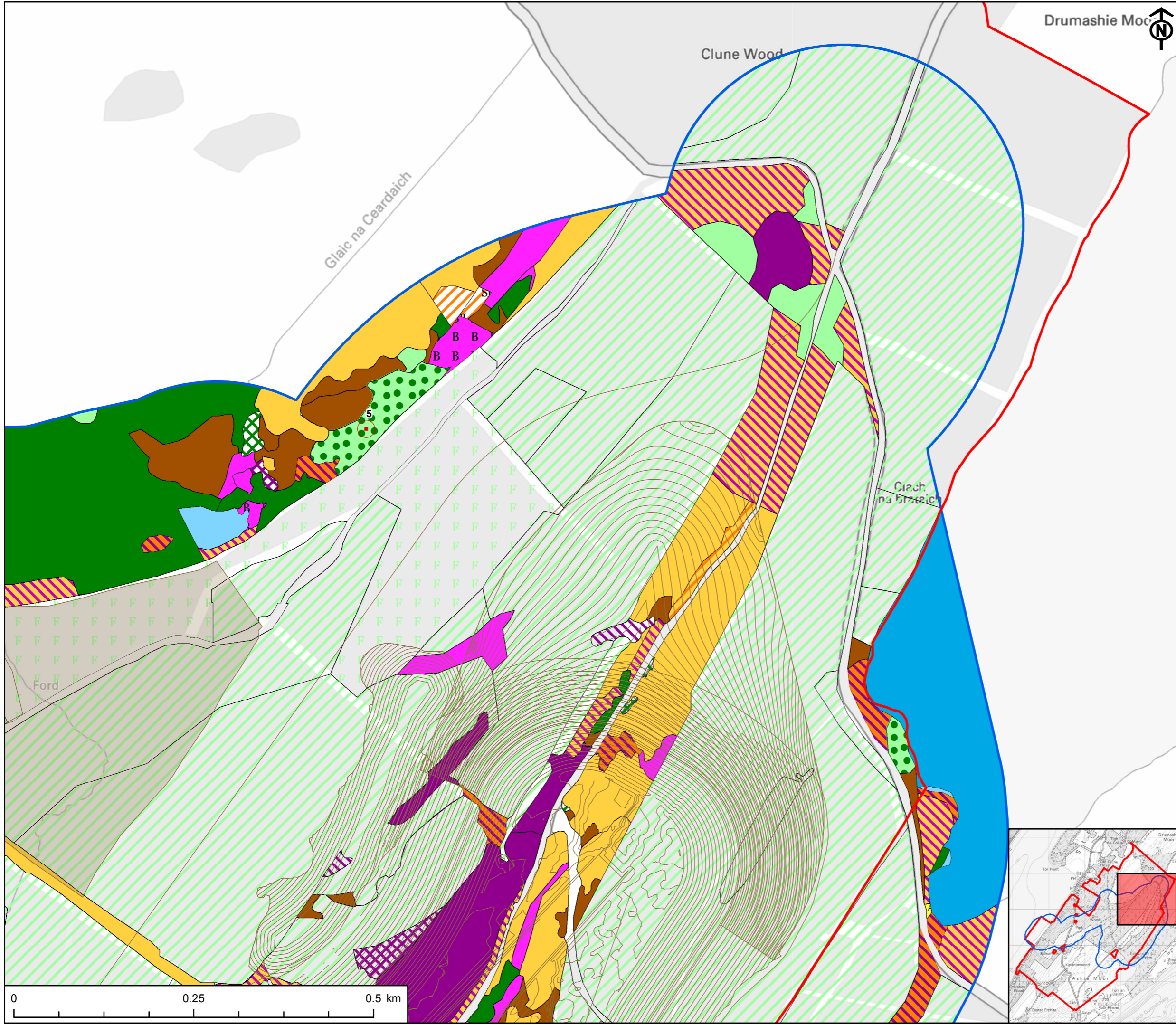
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PROJECT
 RED JOHN PUMPED STORAGE HYDRO

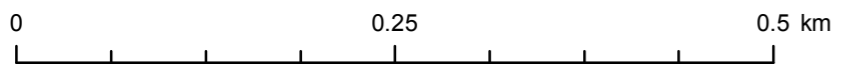
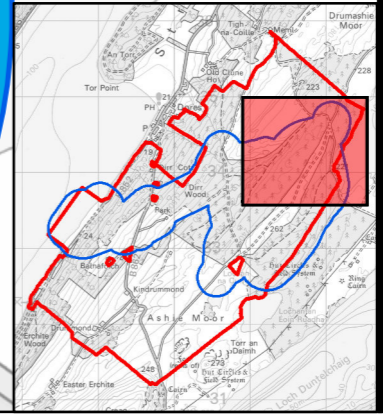
CLIENT
 ILI (Highlands PSH) Ltd.

- KEY**
- Development Site boundary
 - Above ground infrastructure - 250m buffer
 - Above ground infrastructure - Line
 - Above ground infrastructure - Area
 - Target note
 - Broadleaved woodland - semi-natural
 - Coniferous woodland - semi-natural
 - Coniferous woodland - plantation
 - Mixed woodland - semi-natural
 - Scrub - dense/continuous
 - Coniferous woodland - recently felled
 - Acid grassland - unimproved
 - Acid grassland - semi-improved
 - Marsh/marshy grassland
 - Bracken - continuous
 - Dry dwarf shrub heath - acid
 - Wet dwarf shrub heath
 - Dry heath/acid grassland
 - Blanket sphagnum bog
 - Wet modified bog
 - Dry modified bog
 - Flush and spring - acid/neutral flush
 - Flush and spring - basic flush
 - Swamp
 - Standing water
 - Cultivated/disturbed land - amenity grassland

TITLE
 FIGURE 6.1.2
 PHASE 1 HABITAT SURVEY RESULTS

REFERENCE
 RJ_181031_EIA_A6.1.2_v1

SHEET NUMBER 1 of 5
DATE 31/10/18



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PROJECT
RED JOHN PUMPED STORAGE HYDRO

CLIENT
ILI (Highlands PSH) Ltd.

- KEY
- Development Site boundary
 - Excluded from Development Site boundary
 - Above ground infrastructure - 250m buffer
 - Above ground infrastructure - Line
 - Above ground infrastructure - Area
 - × Scrub - scattered
 - Broadleaved scattered trees
 - × Bracken - scattered
 - Broadleaved woodland - semi-natural
 - Coniferous woodland - semi-natural
 - Coniferous woodland - plantation
 - Mixed woodland - semi-natural
 - Scrub - dense/continuous
 - Coniferous woodland - recently felled
 - Acid grassland - unimproved
 - Neutral grassland - semi-improved
 - Improved grassland
 - Marsh/marshy grassland
 - Bracken - continuous
 - Calcareous grassland - unimproved
 - Dry dwarf shrub heath - acid
 - Wet dwarf shrub heath
 - Dry heath/acid grassland
 - Blanket sphagnum bog
 - Flush and spring - acid/neutral flush
 - Flush and spring - basic flush
 - Fen - basin mire
 - Swamp
 - Quarry
 - Cultivated/disturbed land - amenity grassland

TITLE
FIGURE 6.1.2
PHASE 1 HABITAT SURVEY RESULTS

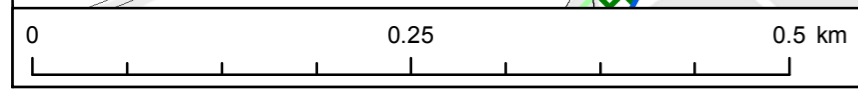
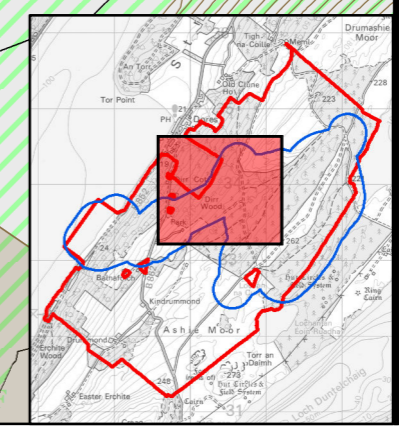
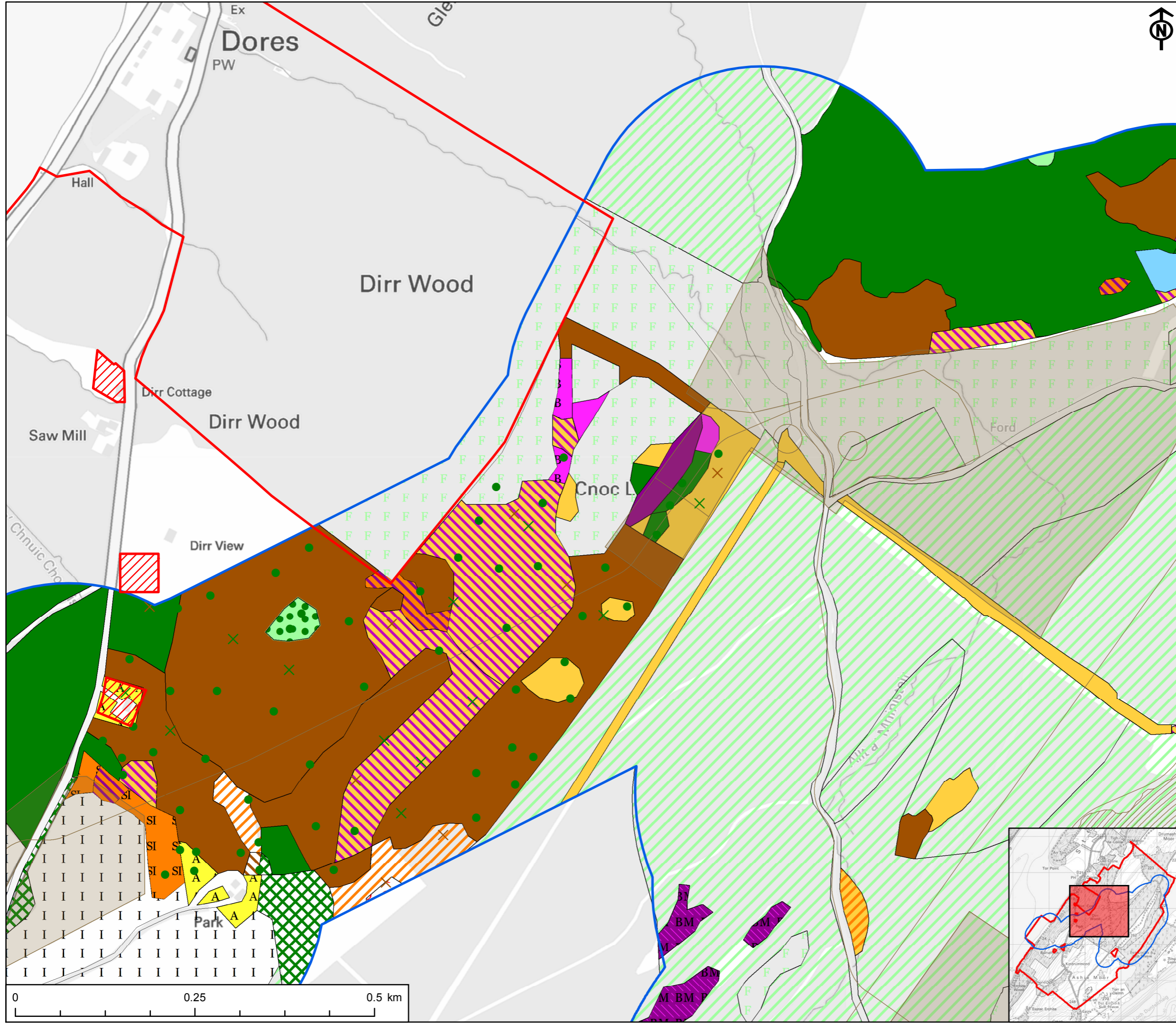
REFERENCE
RJ_181031_EIA_A6.1.2_v1

SHEET NUMBER
2 of 5

DATE
31/10/18

Project Management Initials: CA Designer: LC Checked: SY Approved: CS

Scale @ A3 1:5,000



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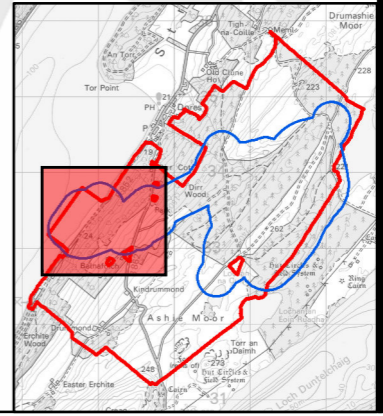
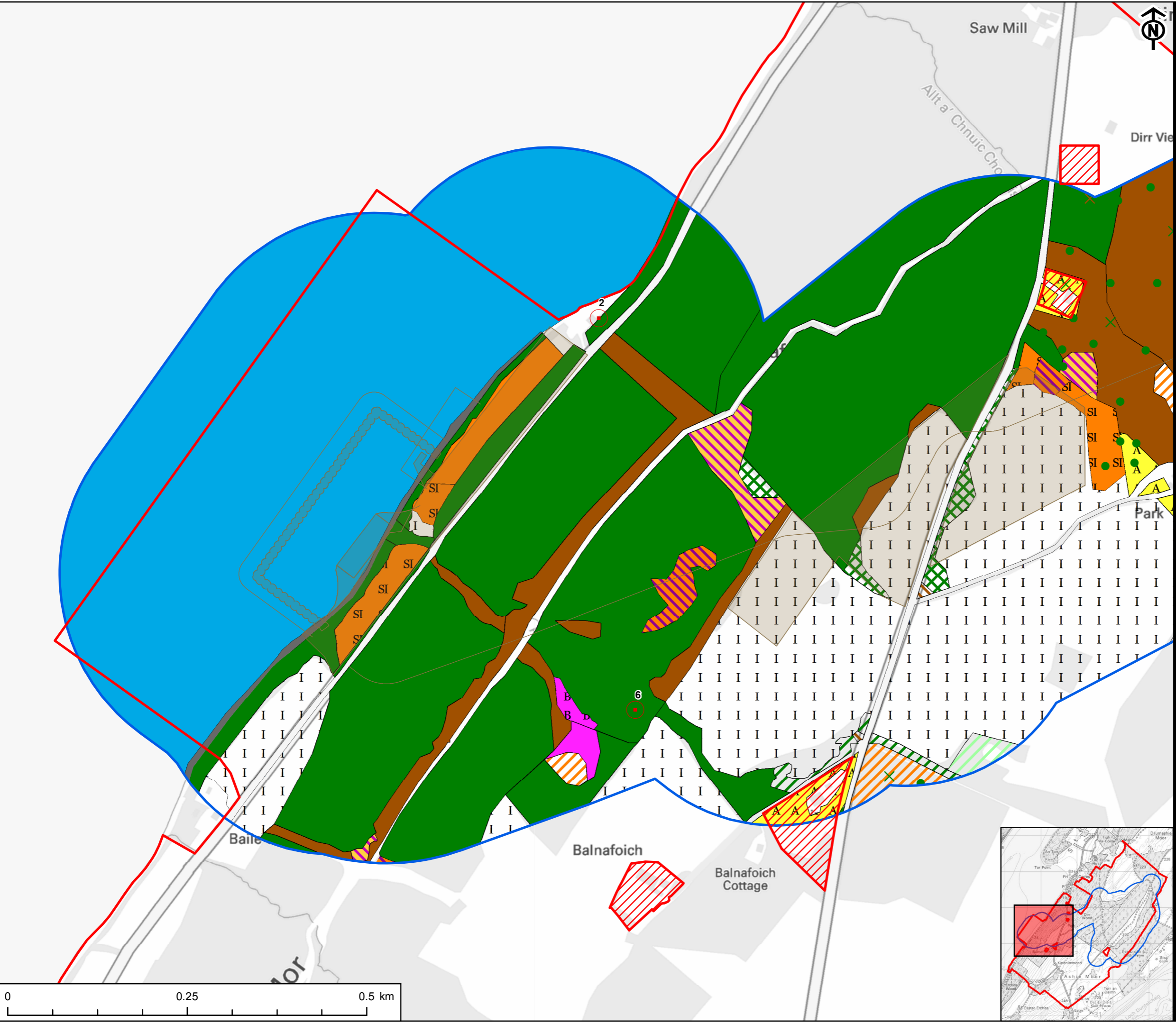
PROJECT
RED JOHN PUMPED STORAGE HYDRO

CLIENT
ILI (Highlands PSH) Ltd.

- KEY
- Development Site boundary
 - Excluded from Development Site boundary
 - Above ground infrastructure - 250m buffer
 - Above ground infrastructure - Line
 - Above ground infrastructure - Area
 - Target note
 - X Scrub - scattered
 - Broadleaved scattered trees
 - X Bracken - scattered
 - Broadleaved woodland - semi-natural
 - Broadleaved woodland - plantation
 - Coniferous woodland - plantation
 - Scrub - dense/continuous
 - Acid grassland - unimproved
 - Neutral grassland - unimproved
 - Neutral grassland - semi-improved
 - Improved grassland
 - Marsh/marshy grassland
 - Bracken - continuous
 - Calcareous grassland - unimproved
 - Wet dwarf shrub heath
 - Flush and spring - acid/neutral flush
 - Flush and spring - basic flush
 - Standing water
 - Cultivated/disturbed land - amenity grassland
 - Pebbles

Project Management Initials: CA Designer: LC Checked: SY Approved: CS

Scale @ A3 1:5,000



TITLE
FIGURE 6.1.2
PHASE 1 HABITAT SURVEY RESULTS

REFERENCE
RJ_181031_EIA_A6.1.2_v1

SHEET NUMBER
3 of 5

DATE
31/10/18

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PROJECT
RED JOHN PUMPED STORAGE HYDRO

CLIENT
ILI (Highlands PSH) Ltd.

- KEY
- Development Site boundary
 - Excluded from Development Site boundary
 - Above ground infrastructure - 250m buffer
 - Above ground infrastructure - Line
 - Above ground infrastructure - Area
 - Target note
 - X Scrub - scattered
 - Broadleaved scattered trees
 - X Bracken - scattered
 - Broadleaved woodland - semi-natural
 - Broadleaved woodland - plantation
 - Coniferous woodland - semi-natural
 - Coniferous woodland - plantation
 - Mixed woodland - semi-natural
 - Mixed woodland - plantation
 - Scrub - dense/continuous
 - Coniferous woodland - recently felled
 - Acid grassland - unimproved
 - Neutral grassland - semi-improved
 - Improved grassland
 - Marsh/marshy grassland
 - Bracken - continuous
 - Calcareous grassland - unimproved
 - Dry dwarf shrub heath - acid
 - Wet dwarf shrub heath
 - Dry heath/acid grassland
 - Blanket sphagnum bog
 - Wet modified bog
 - Dry modified bog
 - Flush and spring - acid/neutral flush
 - Fen - basin mire
 - Swamp
 - Quarry
 - Cultivated/disturbed land - amenity grassland

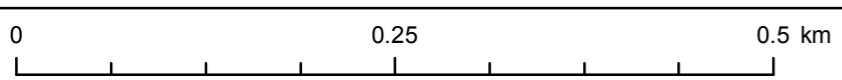
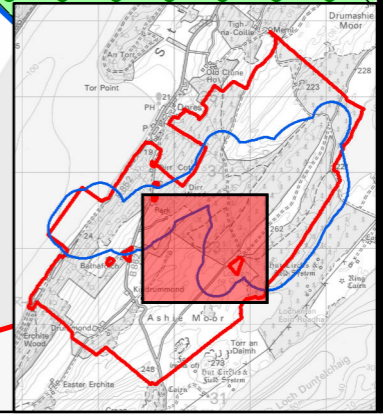
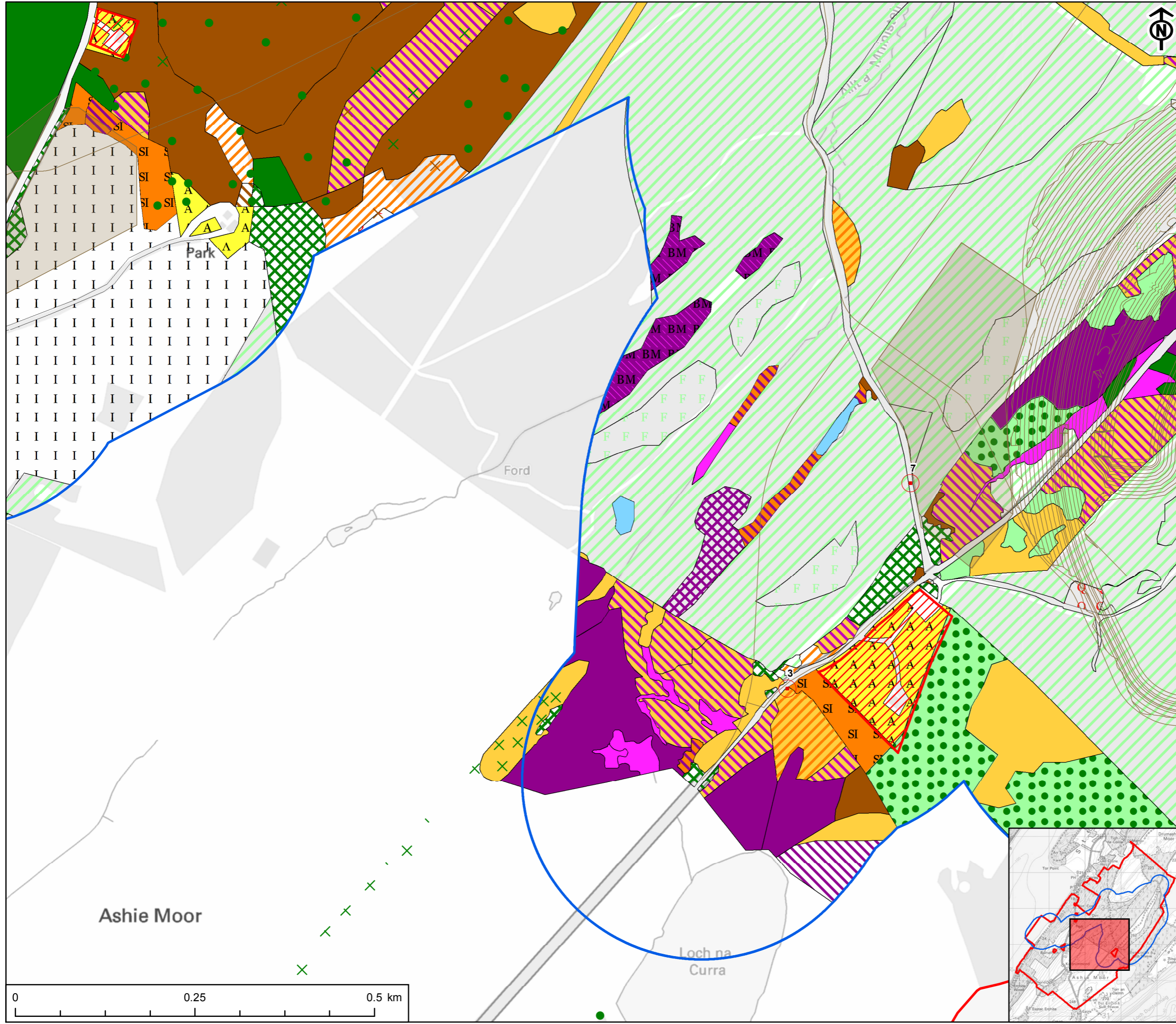
TITLE
FIGURE 6.1.2
PHASE 1 HABITAT SURVEY RESULTS

REFERENCE
RJ_181031_EIA_A6.1.2_v1

SHEET NUMBER DATE
4 of 5 31/10/18

Project Management Initials: CA Designer: LC Checked: SY Approved: CS

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PROJECT
RED JOHN PUMPED STORAGE HYDRO

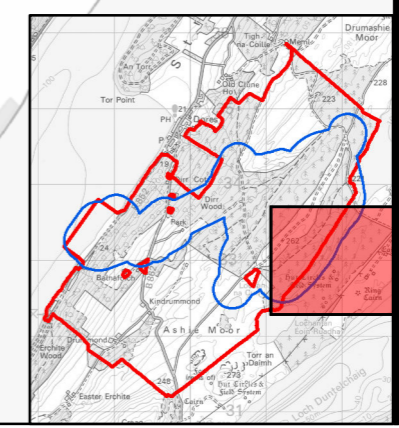
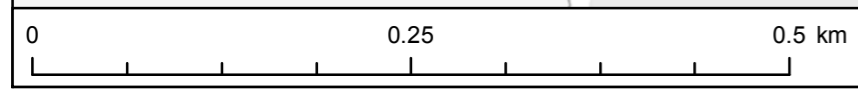
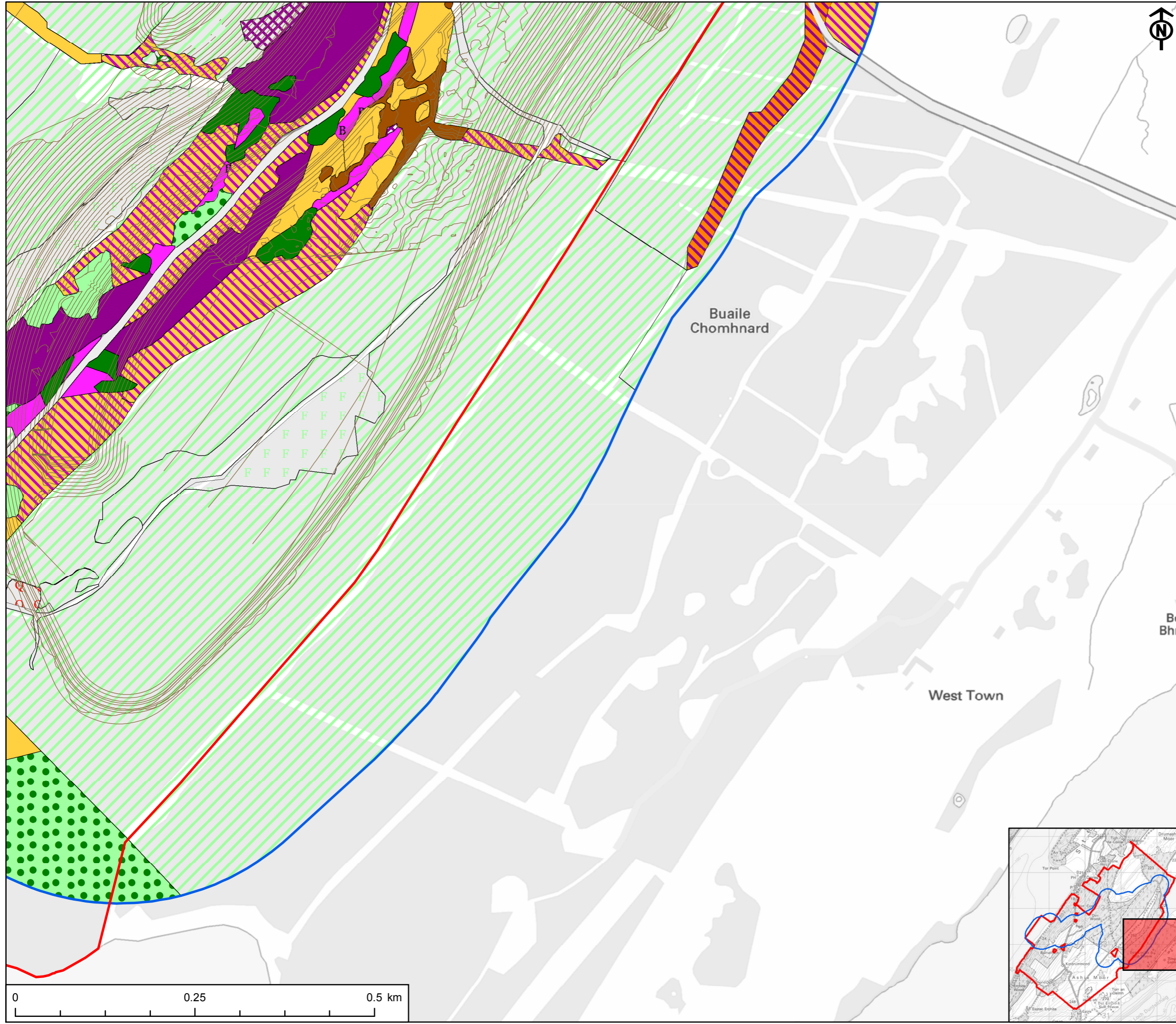
CLIENT
ILI (Highlands PSH) Ltd.

KEY

	Development Site boundary
	Above ground infrastructure - 250m buffer
	Above ground infrastructure - Line
	Above ground infrastructure - Area
	Broadleaved woodland - semi-natural
	Coniferous woodland - semi-natural
	Coniferous woodland - plantation
	Mixed woodland - semi-natural
	Scrub - dense/continuous
	Coniferous woodland - recently felled
	Marsh/marshy grassland
	Bracken - continuous
	Dry dwarf shrub heath - acid
	Wet dwarf shrub heath
	Blanket sphagnum bog
	Wet modified bog
	Flush and spring - acid/neutral flush
	Flush and spring - basic flush
	Quarry

Project Management Initials: CA Designer: LC Checked: SY Approved: CS

Scale @ A3 1:5,000

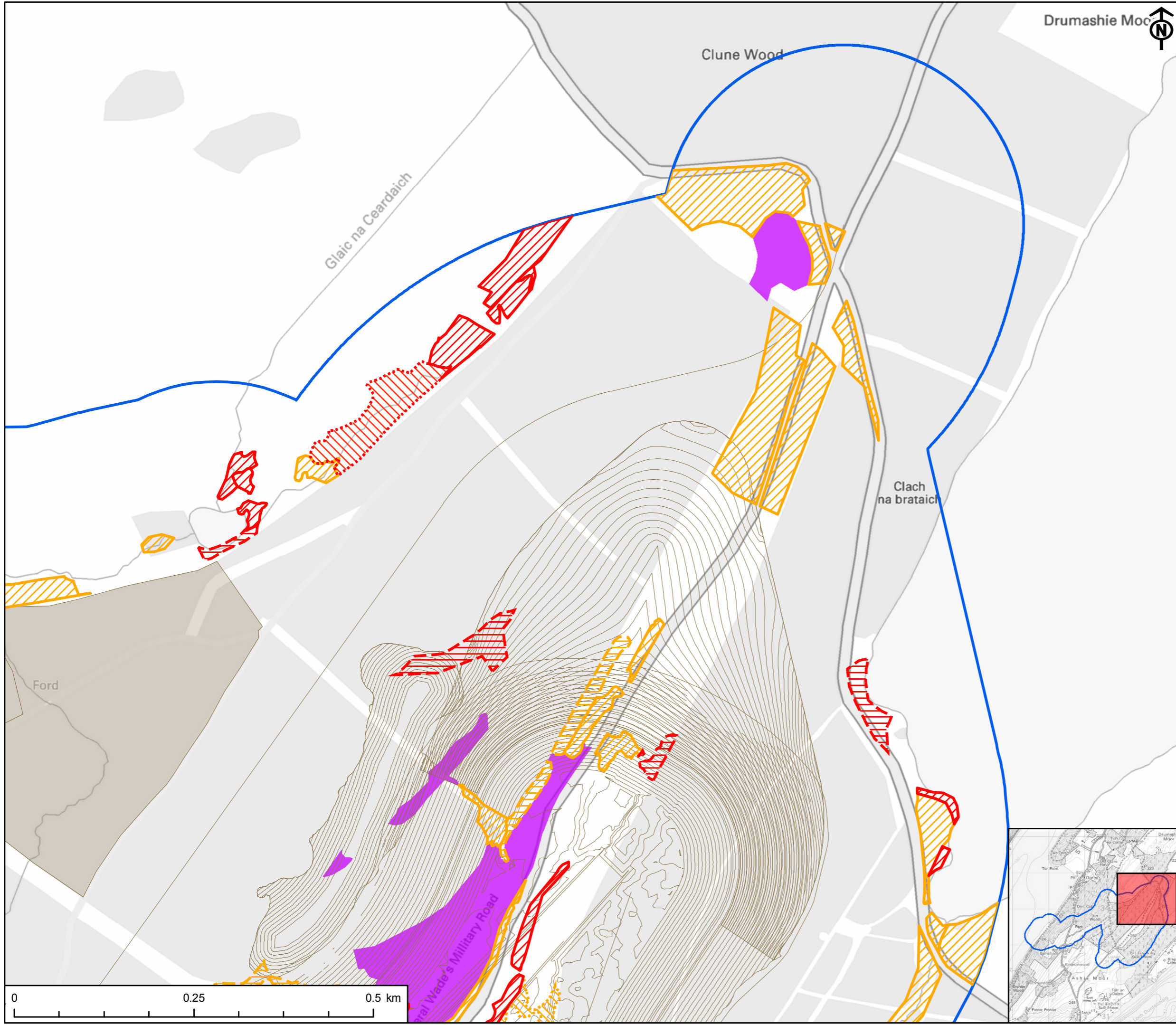


TITLE
FIGURE 6.1.2
PHASE 1 HABITAT SURVEY RESULTS

REFERENCE
RJ_181031_EIA_A6.1.2_v1

SHEET NUMBER 5 of 5 DATE 31/10/18

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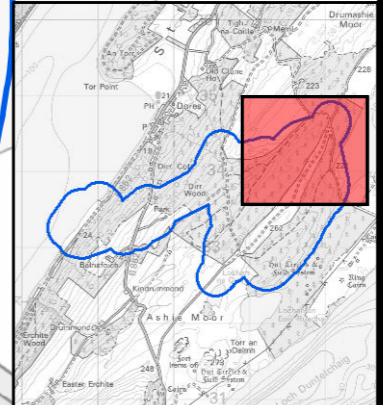
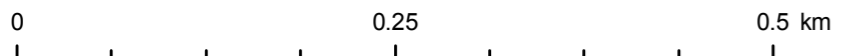


PROJECT
 RED JOHN PUMPED STORAGE HYDRO

CLIENT
 ILI (Highlands PSH) Ltd.

- KEY**
- Above ground infrastructure - 250m buffer
 - Above ground infrastructure - Line
 - Above ground infrastructure - Area
 - High groundwater dependency
 - High (part) groundwater dependency
 - High (small part) groundwater dependency
 - Moderate groundwater dependency
 - Moderate (part) groundwater dependency
 - Moderate (small part) groundwater dependency
 - Peat bog

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









TITLE
 FIGURE 6.1.3
 GWDTE AND PEAT BOG

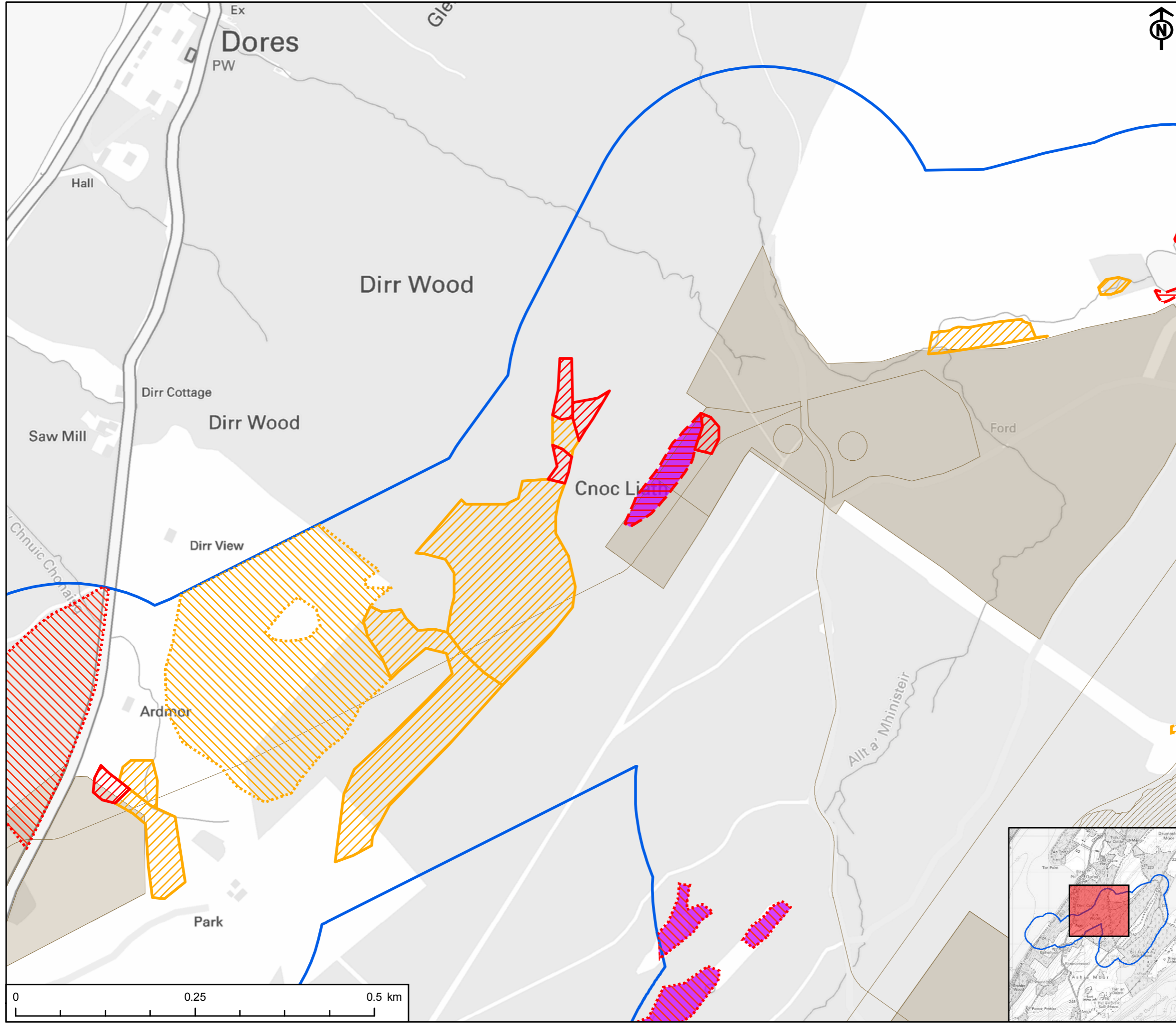
REFERENCE
 RJ_181031_EIA_A6.1.3_v1

SHEET NUMBER 1 of 5 **DATE** 31/10/18

PROJECT
 RED JOHN PUMPED STORAGE HYDRO
 CLIENT
 ILI (Highlands PSH) Ltd.

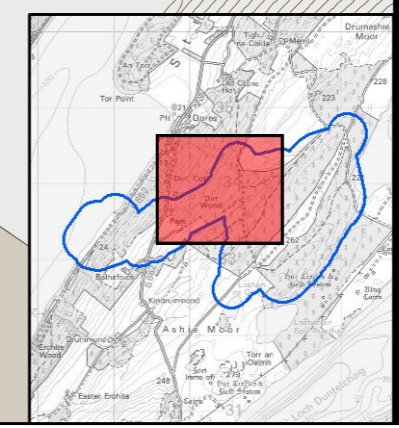
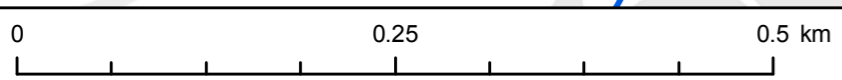
- KEY
-  Above ground infrastructure - 250m buffer
 -  Above ground infrastructure - Line
 -  Above ground infrastructure - Area
 -  High groundwater dependency
 -  High (part) groundwater dependency
 -  High (small part) groundwater dependency
 -  Moderate groundwater dependency
 -  Moderate (part) groundwater dependency
 -  Moderate (small part) groundwater dependency
 -  Peat bog

Project Management Initials: CA Designer: LC Checked: SY Approved: CS



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Scale @ A3 1:5,000



TITLE
 FIGURE 6.1.3
 GWDTE AND PEAT BOG









REFERENCE
 RJ_181031_EIA_A6.1.3_v1

SHEET NUMBER
 2 of 5

DATE
 31/10/18

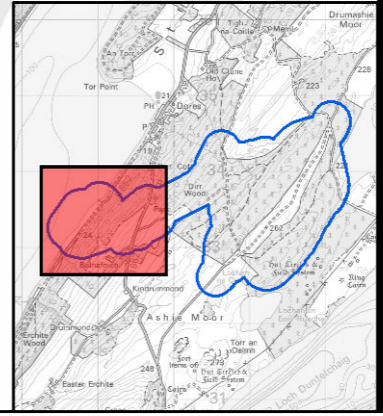
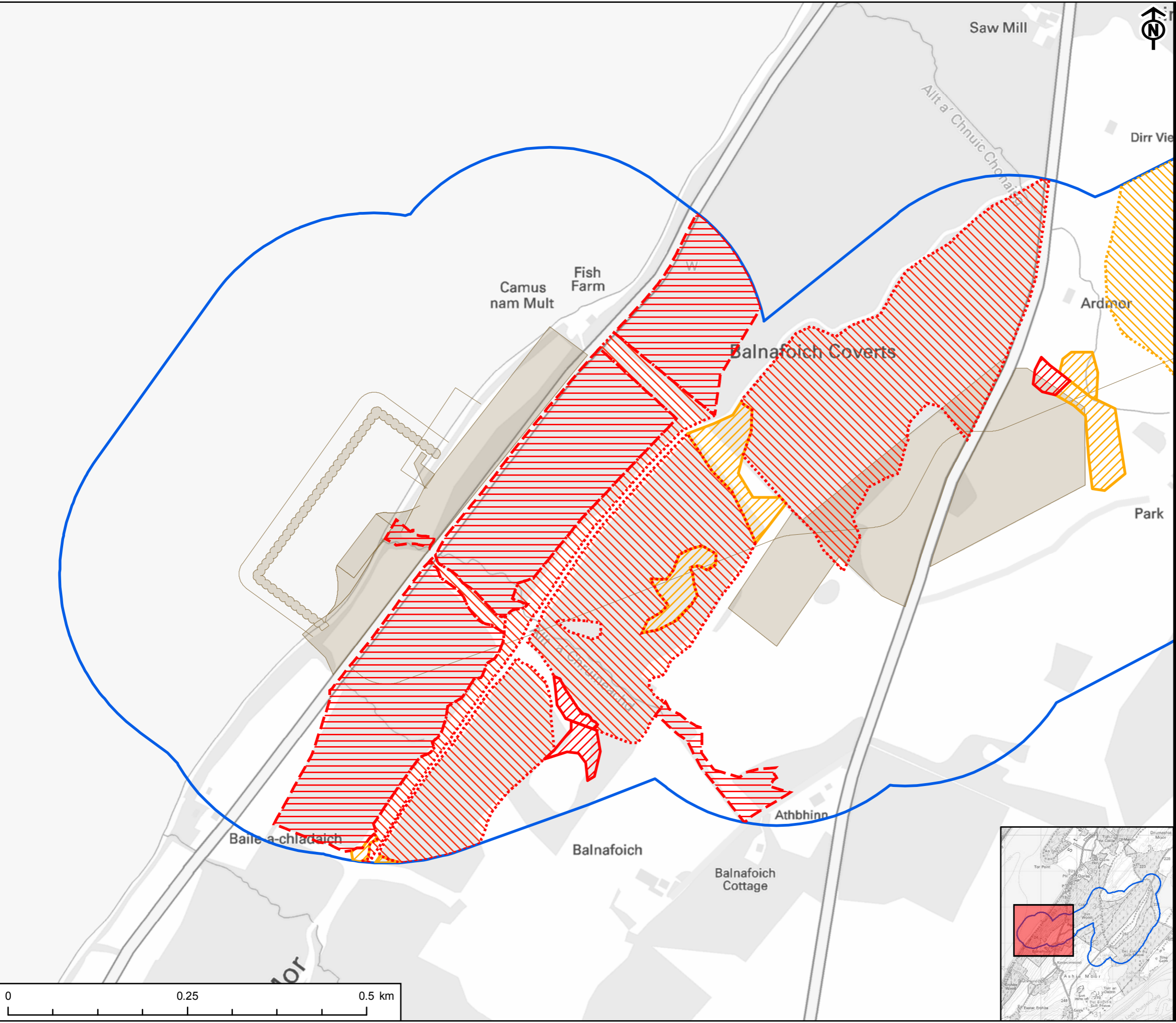
PROJECT
RED JOHN PUMPED STORAGE HYDRO

CLIENT
ILI (Highlands PSH) Ltd.

- KEY
-  Above ground infrastructure - 250m buffer
 -  Above ground infrastructure - Line
 -  Above ground infrastructure - Area
 -  High groundwater dependency
 -  High (part) groundwater dependency
 -  High (small part) groundwater dependency
 -  Moderate groundwater dependency
 -  Moderate (small part) groundwater dependency

Project Management Initials: CA Designer: LC Checked: SY Approved: CS

Scale @ A3 1:5,000



TITLE
FIGURE 6.1.3
GWDTE AND PEAT BOG

REFERENCE
RJ_181031_EIA_A6.1.3_v1

SHEET NUMBER 3 of 5 DATE 31/10/18

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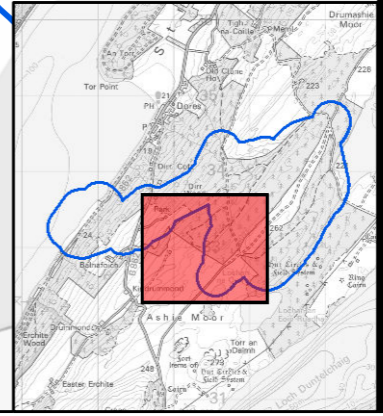
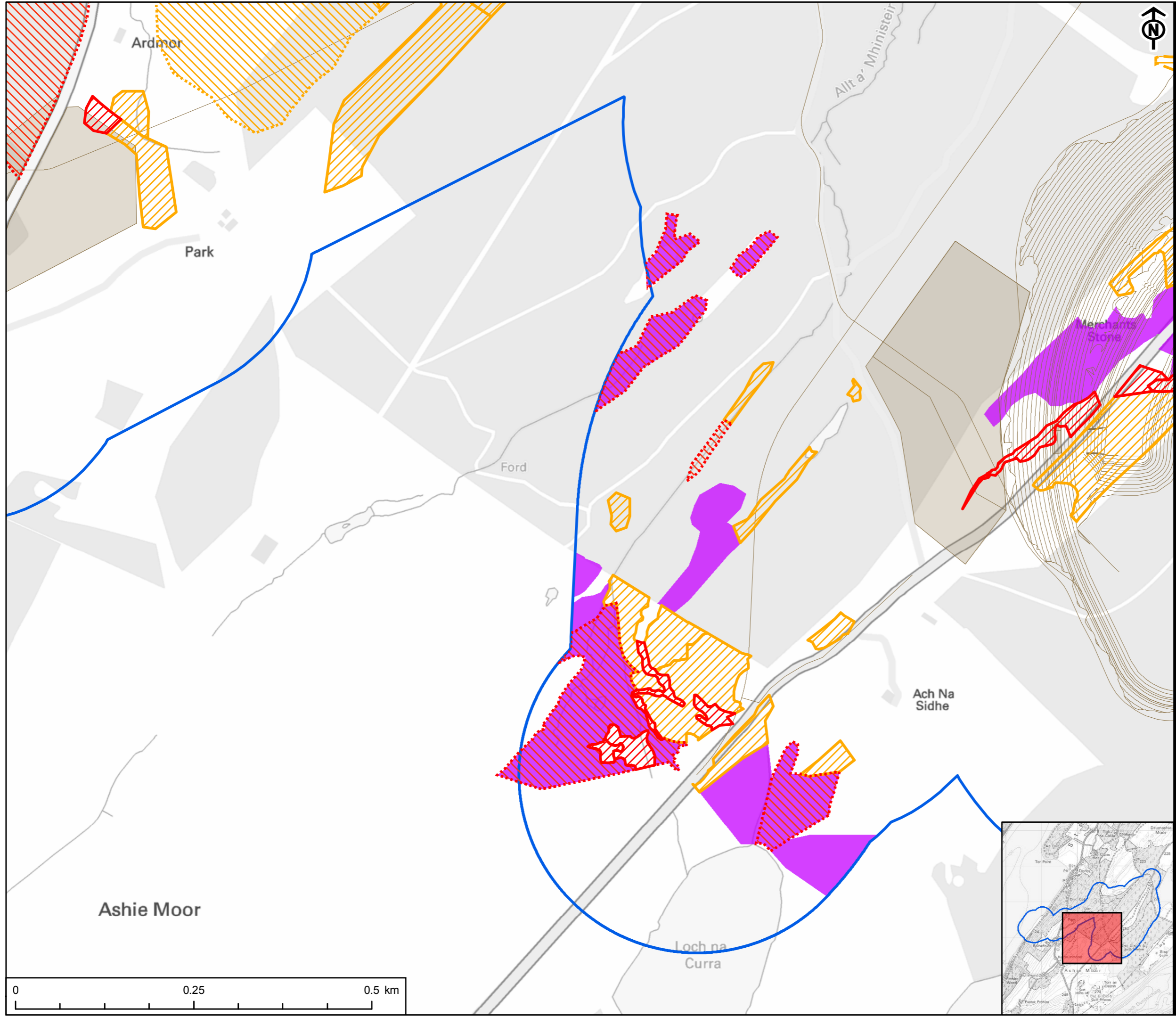
PROJECT
RED JOHN PUMPED STORAGE HYDRO

CLIENT
ILI (Highlands PSH) Ltd.

- KEY
- Above ground infrastructure - 250m buffer
 - Above ground infrastructure - Line
 - Above ground infrastructure - Area
 - High groundwater dependency
 - High (small part) groundwater dependency
 - Moderate groundwater dependency
 - Moderate (part) groundwater dependency
 - Moderate (small part) groundwater dependency
 - Peat bog

Project Management Initials: CA Designer: LC Checked: SY Approved: CS

Scale @ A3 1:5,000



TITLE
FIGURE 6.1.3
GWDTE AND PEAT BOG

REFERENCE
RJ_181031_EIA_A6.1.3_v1

SHEET NUMBER
4 of 5

DATE
31/10/18

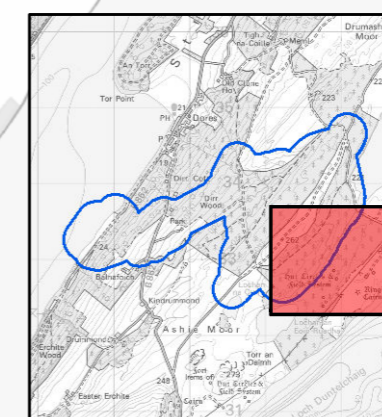
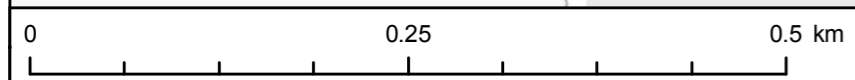
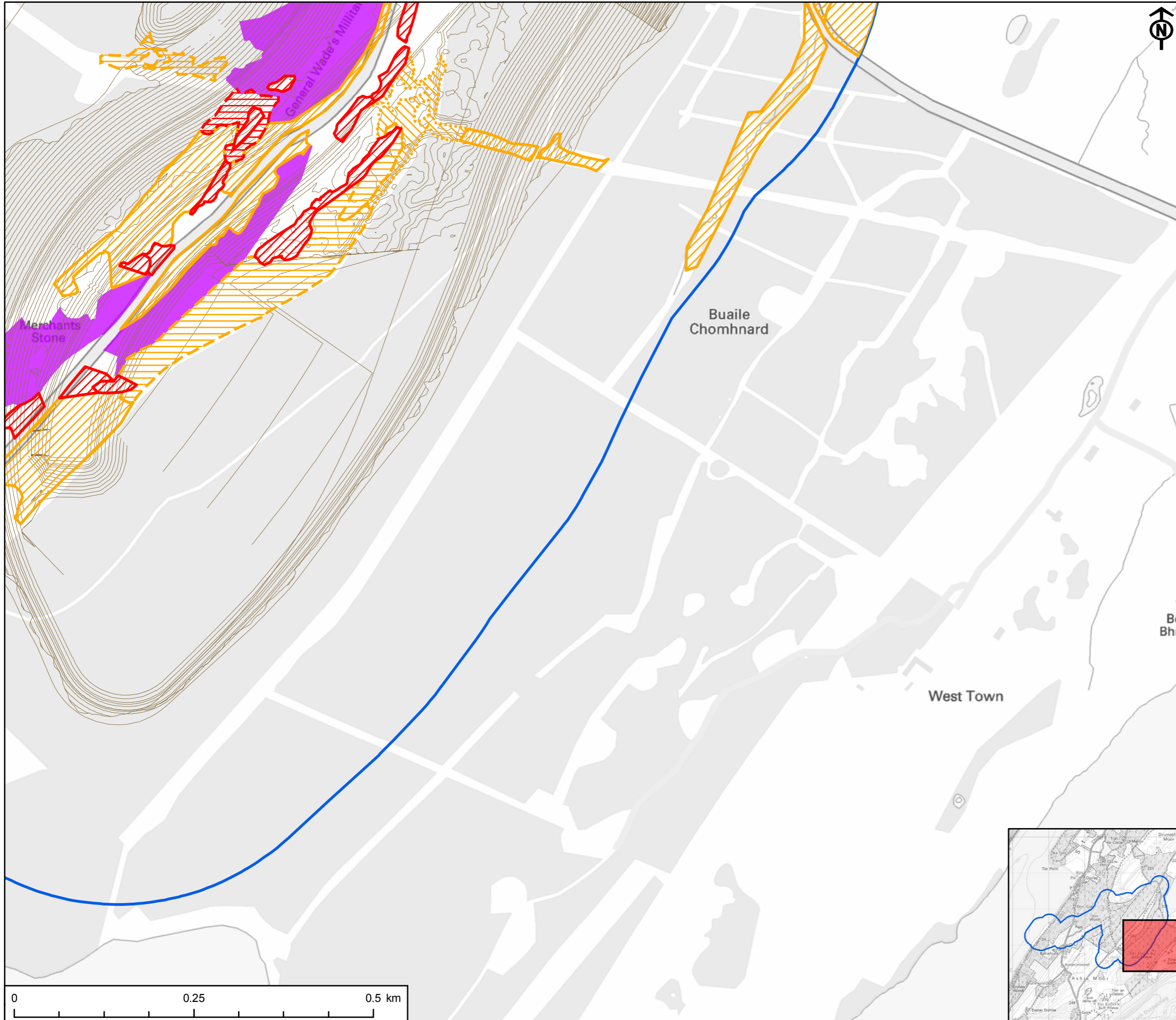
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PROJECT
RED JOHN PUMPED STORAGE HYDRO
CLIENT
ILI (Highlands PSH) Ltd.

- KEY
- Above ground infrastructure - 250m buffer
 - Above ground infrastructure - Line
 - Above ground infrastructure - Area
 - High groundwater dependency
 - High (part) groundwater dependency
 - Moderate groundwater dependency
 - Moderate (part) groundwater dependency
 - Moderate (small part) groundwater dependency
 - Peat bog

Project Management Initials: CA Designer: LC Checked: SY Approved: CS

Scale @ A3 1:5,000



TITLE
FIGURE 6.1.3
GWDTE AND PEAT BOG

REFERENCE
RJ_181031_EIA_A6.1.3_v1

SHEET NUMBER 5 of 5 DATE 31/10/18

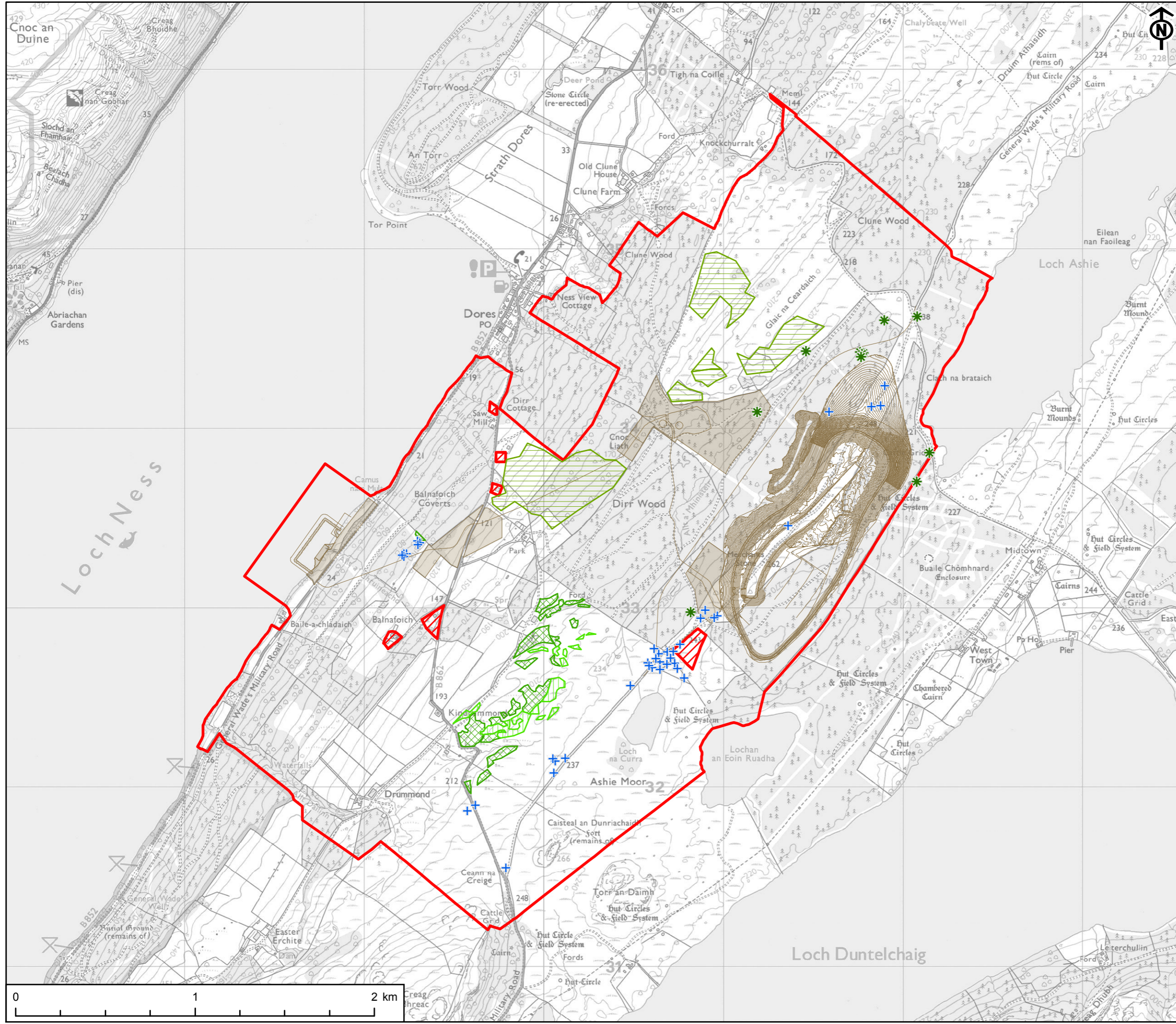
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PROJECT
 RED JOHN PUMPED STORAGE HYDRO

CLIENT
 ILI (Highlands PSH) Ltd.

- KEY**
- Development Site boundary
 - Excluded from Development Site boundary
 - Above ground infrastructure - Line
 - Above ground infrastructure - Area
 - * Veteran Scots pine (very large with irregular branching, retained within existing plantation)
 - + Individual or small groups of scattered Juniper bushes
 - Dense scrub including juniper (gorse usually dominant)
 - Scattered scrub including juniper
 - Widely scattered scrub including juniper

Project Management Initials: CA Designer: LC Checked: SY Approved: CS

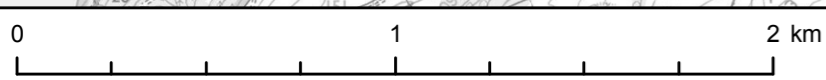


TITLE
 FIGURE 6.1.4
 MAIN JUNIPER LOCATIONS AND
 VETERAN PINES

REFERENCE
 RJ_181031_EIA_A6.1.4_v1

SHEET NUMBER 1 of 1 **DATE** 31/10/18

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