

12 ECOLOGY AND NATURE CONSERVATION

12.1 Introduction

12.1.1 This Chapter reports the potentially significant impacts of the Proposed Development in terms of Ecology and Nature Conservation in the context of the Site and surrounding area.

12.1.2 This Chapter (and its associated appendices) are intended to be read with reference to Chapters 1- 5 of this Environmental Impact Assessment Report (EIAR), as well as the final chapters, 'Summary of Residual and Cumulative Effects' and 'Summary and Conclusions' (Chapters 16 and 17); and Appendix 12.1 (Preliminary Ecological Appraisal).

12.1.3 A Habitat Regulations Assessment Screening Report has been produced (See Appendix 12.2) to assess the Likely Significant Effects of the Proposed Development on the qualifying features of these designated areas, in the context of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

12.2 Legislation, Policy and Guidance

12.2.1 The relevant legislation, policy and guidance are listed below, with further details provided in Appendix 12.1.

Legislative Framework

12.2.2 The applicable legislative framework is summarised as follows:

- Wildlife and Countryside Act 1981 (as amended);
- Conservation (Natural Habitats, &c.) Regulations 1994 (As amended);
- Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019;
- Nature Conservation (Scotland) Act 2004 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2011 (WANE);
- The Protection of Badgers Act 1992; and
- Protection of Wild Mammals (Scotland) Act 2002.

Planning Policy

12.2.3 The applicable planning policy is summarised as follows:

- Scottish Planning Policy 2014;

- UK Post 2010 Biodiversity Framework;
- Ayrshire Local Biodiversity Action Plan;
- East Ayrshire Community Plan 2015-2030 – Strategic Environmental Assessment;
- East Ayrshire Biodiversity Duty Report 2015-2017;
- East Ayrshire Local Development Plan 2017;
- East Ayrshire Local Development Plan 2020 (LDP2) Consultation; and
- 2018 – 2020 East Ayrshire Biodiversity Duty Delivery Plan.

Guidance

12.2.4 The applicable guidance is summarised as follows:

- CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (version 1.1). Chartered Institute of Ecology and Environmental Management, Winchester;
- British Standards Institute (2013) *Biodiversity – Code of Practice for Planning and Development*;
- Institute of Environmental Assessment (1995) *Guidelines for Baseline Ecological Assessment*;
- Joint Nature Conservation Committee (2012), *The Biodiversity Framework*; and
- Defra (2011) *Biodiversity 2020*.

12.2.5 In addition, survey specific best practice guidelines were used in undertaking all fieldwork. These are described in further detail within the Preliminary Ecological Appraisal Report, within Appendix 12.1.

12.3 Assessment Methodology and Significance Criteria

Scope of the Assessment

12.3.1 This chapter considers the ecological features that have potential to be impacted by the construction and operation of the Proposed Development. These features have been identified as a result of the desk study and field surveys undertaken for the site. Impacts upon the following ecological features are assessed in this chapter:

- Designated areas:
 - Airs Moss Special Area of Conservation (SAC),

- Muirkirk and North Lowther Uplands Special Protection Area (SPA), Barlosh Moss Site of Special Scientific Importance (SSSI),
- Burnock Water Local Wildlife Site (LWS) and
- Ancient Woodland;
- Notable habitats – Standing Water; and
- Protected species – Breeding birds.

12.3.2 The ecological designations considered in this assessment are shown on Drawing Number GM11372-028 Ecological Designations Plan. The baseline conditions of these ecological features are summarised in Section 12.4.

Receptors Not Considered within the Scope

12.3.3 On the basis of the professional judgement of the EIA team, results of field surveys, consultation with policy guidance, and feedback received from consultees, the following topic areas have been ‘scoped out’ of detailed assessment.

Designated Sites

12.3.4 Impacts on the following statutory areas have been scoped out of detailed assessment due to their respective qualifying features, distance and lack of ecological and hydrological connectivity to the Site, which are unlikely to result in significant impacts from the Proposed Development:

- River Ayr Gorge Site of Special Scientific Interest (SSSI);
- Muirkirk Uplands (SSSI);
- Dalmellington Moss (SSSI);
- Bogton Loch (SSSI); and
- Martnaham Loch and Wood (SSSI).

12.3.5 Impacts on Barlosh Moss SSSI and Burnock Water Local Wildlife Site (LWS) have been scoped into the assessment due to the potential impacts from air quality emissions and hydrological linkages at these designated areas (see Chapter 8).

12.3.6 No ancient woodland is present within the Proposed Development site and no removal of ancient woodland will be undertaken as part of the Proposed Development. There are five areas of ancient woodland identified within 2km of the

Proposed Development (NatureScot, 2021)¹, which are all Long-established of plantation origin (LEPO). There will be no impairment of woodland habitat connectivity during the construction or operation of the Proposed Development. Potential effects on ancient woodland are scoped out from detailed assessment, with the exception of three unnamed areas of LEPO woodland which will be assessed for impacts from air quality emissions (see Chapter 8).

Habitats

12.3.7 Habitats within the Site including improved grassland, poor semi-improved neutral grassland, intact hedgerow (species poor), scattered trees and ephemeral vegetation, exist in small areas. These habitats are of low conservation value at a Site level and are common habitat types locally, regionally and nationally. No habitats on site were identified as ground water dependant terrestrial ecosystems or were derived from peatland and are therefore the above habitats are scoped out of the assessment.

Protected and Notable Species

12.3.8 Due to the lack of field evidence, local records and very limited suitable habitat within the Site, the following protected species have been scoped out of further assessment: badger (*Meles meles*), European hedgehog (*Erinaceus europaeus*), pine marten (*Martes martes*), red squirrel (*Sciurus vulgaris*) and water vole (*Arvicola amphibius*). Local records of otter (*Lutra lutra*), brown hare (*Lepus europaeus*) and reptile species were identified within 2km of the Site. These species are therefore evaluated at less than Site level. However, these species have also been scoped out of further assessment due to the very limited presence of suitable habitat within the Site and the lack of field evidence recorded during surveys.

Bats

12.3.9 The Site contains four buildings all of which have been classified as having negligible suitability for roosting bats, all of which will be retained as part of the Proposed Development. Low-quality foraging habitat was identified on the Site, and limited foraging and potential roosting habitat for bats is present within the surrounding area. There are no records of bats within 2km of the Site. Therefore, due to the very limited foraging and roost potential that is of value at less than Site level, bats have been scoped out of further assessment.

Great Crested Newt

12.3.10 No local records of great crested newt (*Triturus cristatus*) (GCN) were identified, and only one area of standing open water was recorded within the Site which was assessed as offering ‘poor’ habitat for GCN. A further 10 waterbodies were recorded within 500m of the Site, nine of which were classified as poor and one as below average, therefore the waterbodies were not subject to further assessment for GCN. Therefore, GCN are evaluated at less than Site level. Poor semi-grassland habitat within the survey boundary provides only limited suitable foraging habitat for the species. Based on this information, GCN have been scoped out of further assessment.

Extent of the Study Area

12.3.11 The study areas within which the desk-based research and field surveys were undertaken varied depending on the ecological feature and its search/survey requirements. Details of the extent of each search/study area are described in the relevant sections in Appendix 12.1. The study area for local protected species records was 2km from the Site boundary and designated areas of international importance were recorded up to 15km from the Site. The study area for most protected species and habitat surveys is restricted to the Site boundary. The study area for waterbodies suitable for GCN is 500m from the Site boundary.

Consultation Undertaken to Date

12.3.12 Consultation activities have been undertaken with organisations including: NatureScot (formerly Scottish Natural Heritage), East Ayrshire Council, Scottish Water, The Coal Authority and Historic Environment Scotland. With the exclusion of NatureScot, none of the above correspondence have any relevance to ecology.

12.3.13 Table 12.1 provides a summary of the consultation activities undertaken in support of the preparation of this Chapter.

Table 12.1: Summary of Consultation Undertaken to Date			
Organisation	Individual(s)	Meeting Date and other forms of Consultation	Summary of Outcome of Discussion
East Ayrshire Council (EAC)	Peter Atkinson	Formal consultation response dated: 21/01/2020	No issues raised. EAC are broadly content with the proposed approach.
NatureScot	Ian Cornforth	Formal consultation response dated: 19/01/2020	Airds Moss Special Area of Conservation and Muirkirk and North Lowther Special Protection Area should be considered within the assessment.



Table 12.1: Summary of Consultation Undertaken to Date

Organisation	Individual(s)	Meeting Date and other forms of Consultation	Summary of Outcome of Discussion
			NatureScot advise that the assessment should include dust, nitrogen and acid deposition impacts on all protected areas within 2km.
			NatureScot advise that the extent of hydrological connectivity, for example, through drainage pathways between the application Site and the Barlosh Moss Site of Special Scientific Interest (SSSI), are identified, and the impact of the Proposed Development on the SSSI is assessed and any necessary mitigation identified. An assessment of the impacts of dust, nitrogen and acid deposition should also be carried out and any necessary mitigation identified.
			NatureScot advise that an assessment for the impacts of dust, nitrogen and acid deposition is carried out on the Burnock Water Local Wildlife Site (LWS).
			NatureScot advise that protected species surveys should be completed no more than 18 months prior to submission of the application, and that a species protection plan should be prepared for any species that could be affected by the proposal.
			Ground or vegetation clearance works should be undertaken out with the main nesting bird season (March-August inclusive). If this is not possible, a Breeding Bird Protection plan should be prepared. This should make provision for a suitably experienced ecologist to check the development Site before work commences to determine the presence of any nesting birds and to implement suitably sized buffer zones around active nests where no work will take place until the young have fledged or the nest is no longer in use.
			The relationship between the development site and waterbodies close to Site needs to be established and any relevant mitigation presented to demonstrate their ecological integrity and that dependent species will be enhanced by this proposal.

Assessment Methodology

12.3.14 The method of baseline data collection and assessment has been agreed with East Ayrshire Council and is in accordance with The Chartered Institute of Ecology and

Environmental Management (CIEEM 2018) and current guidance and industry best practice. Full details are provided in Appendix 12.1.

12.3.15 The assessment of significance of impacts is determined by identifying the presence of Important Ecological Features (IEFs); evaluating their importance or value and defining the magnitude of the effects. In order to objectively assess effects arising from a particular development/activity it is essential to establish the sensitivity of each IEF. The sensitivity is evaluated within a geographical context, with each feature falling into one (or more) of the following categories:

- International and European;
- National (within Scotland);
- Regional (South West);
- County/ Metropolitan (East Ayrshire);
- Local (Ochiltree);
- Site (i.e. within the defined survey area); and
- Of negligible importance.

12.3.16 When an ecological feature falls into more than one category, it is considered to be within the higher level. Some features can be readily assigned to one of the above categories, particularly areas that support designations. For example, a site with a designation assigned through European legislation, such as an SAC would normally be considered of International Value; a SSSI designated by UK statute would be of National Importance; and a site designated by a Local Authority would be of County Importance.

12.3.17 Ecological features which are considered to be of value at local level or higher for which significant impacts can be reasonably anticipated are identified as valued ecological features and are discussed throughout the report. Features which are not exposed to negative (or positive) effects are excluded from the assessment.

Significance Criteria

12.3.18 Likely impacts on the features occurring within the Site have been identified through consideration of the proposals. The impacts were characterised with reference to the following:

- whether an impact is considered to be positive or negative;



- the extent/magnitude of the impact;
 - duration of the impact, its timing and frequency; and
- whether any of the impacts are cumulative in effect.

12.3.19 Both positive and negative impacts/effects will be determined according to whether the change is in accordance with nature conservation initiatives and policy. The definitions provided within CIEEM guidance (2018) are detailed within Table 12.2, below. Confidence in the assessment, based on the availability of supporting evidence is expressed as being either High, Moderate or Low.

Table 12.2: Definition of positive and negative effects	
Positive	A change that improves the quality of the environment e.g. by increasing species diversity extending habitat or improving water quality. Positive impacts may also include halting or slowing an existing decline in the quality of the environment.
Negative	A change which reduces the quality of the environment e.g. destruction of habitat, removal of species foraging habitat, habitat fragmentation, pollution.

12.3.20 Following impact characterisation, assessments are made based on professional judgement, as to whether there would be any corresponding loss of integrity (of a site or ecosystem) or whether the conservation status (of a habitat or species) is likely to be affected, i.e. whether the magnitude of impact(s) would be 'significant' in ecological terms.

12.3.21 As indicated in the CIEEM guidance, the impact may influence the conservation status and integrity of features, and effects may be judged to be significant in ecological terms even at the Site level.

12.3.22 Regarding cumulative assessment, two types of cumulative effects will be assessed:

- Type 1 Effects: The combination of individual effects (for example noise, dust and visual effects) from a development on a particular feature; and
- Type 2 Effects: Effects from several committed developments, which individually might be insignificant, but when considered together could create a significant cumulative effect.

12.4 Baseline Conditions

12.4.1 This section provides a summary of the relevant results of the desk study and field surveys, providing the baseline conditions in relation to the sensitive receptors



identified in Section 12.3.1. The baseline conditions of the sensitive receptors identified at the Site are fully described in Appendix 12.1.

Sensitive Receptors

Designated Areas

12.4.2 There are no statutory designations with ecological features within the Site. The closest statutory designated area is the Barlosh Moss SSSI, which is approximately 1.7km south of the Site and is also a non-statutory LWS. Statutory and non-statutory designated areas identified within 15km are described in Table 12.3 below.



Table 12.3: Designated Sites Evaluation

Site Name and Status ²	Reason for Designation/identification	Distance from the Proposed Development (km)	Negative Pressures	Further Assessment Required? (Yes/ No and Justification)
Airds Moss SAC	This area is composed of bogs, marshes, water fringed vegetation, fens (73%), humid grassland, mesophile grassland (7%), coniferous woodland (19%) and other land (including towns, villages, roads, waste places, mines, industrial sites) (1%). The qualifying feature of the area is the presence of blanket bog.	Approx. 11km east of the Site.	Invasive non-native species, air pollution, air-borne pollutants, renewable abiotic energy use, roads, paths and railroads, utility and service lines, problematic native species, human induced changes in hydraulic conditions.	Yes - potential impacts on qualifying features as a result of airborne emissions will be considered further as a precaution. No further assessment is required with regards to potential impacts on hydraulic conditions or habitats. No direct adverse effects and unlikely significant adverse indirect effects given the separation distance and lack of hydrological links and lack of suitable habitats within the site for qualifying habitats/ species.
Muirkirk and North Lowther Uplands SPA	Muirkirk and North Lowther Uplands SPA comprises three adjacent upland areas (situated to the north and south of the town of Muirkirk, and the northern Lowther Hills), together with Airds Moss, a low-lying blanket bog situated between the two upland areas of north and south Muirkirk. The predominant habitats include semi-natural areas of blanket bog, acid grassland and heath.	Approx. 10km east of the Site.	Renewable abiotic energy use, other ecosystem modifications, changes in biotic conditions.	Yes - potential impacts on qualifying features as a result of airborne emissions will be considered further as a precaution.

² SAC – Special Area of Conservation, SPA - Special Protected areas, SSSI - Site of Special Scientific Interest, LWS – Local Wildlife Site.



Table 12.3: Designated Sites Evaluation

Site Name and Status ²	Reason for Designation/identification	Distance from the Proposed Development (km)	Negative Pressures	Further Assessment Required? (Yes/ No and Justification)
	Qualifying features are breeding hen harrier, short eared owl, peregrine, merlin and golden plover.			No further assessment is required with regards to potential impacts on hydraulic conditions or habitats. No direct adverse effects and unlikely significant adverse indirect effects given the separation distance and lack of hydrological links and lack of suitable habitats within the site for qualifying habitats/ species.
Barlosh Moss Site of SSSI and LWS	The Site is divided into two, hydrologically linked sections. The western section comprises a hydromorphological mire range, a complex of wetland habitats which includes reeds, swamp, poor fen, marshy grassland and birch/willow carr. The eastern section comprises raised bog, typified by the presence of <i>Sphagnum</i> mosses and higher plants such as cranberry and bog rosemary. In some areas of the bog the hummock and hollow topography is evident.	Approx. 1.7km south of the Site.	N/A	Yes - potential impacts on qualifying features as a result of airborne emissions.
Burnock Water LWS	Semi-natural gorge woodland plus areas of gorse/broom scrub, old coppiced hazel woodland and small areas of semi-improved grassland.	Approx. 1.7km east of Site.	N/A	Yes - potential impacts on qualifying features as a result of airborne emissions to be further considered.



Table 12.3: Designated Sites Evaluation

Site Name and Status ²	Reason for Designation/identification	Distance from the Proposed Development (km)	Negative Pressures	Further Assessment Required? (Yes/ No and Justification)
River Ayr Gorge SSSI	Upland oak woodland dominated by even-aged stands of oak with a well-developed shrub layer of predominantly birch, as well as holly, rowan and hazel. Other native trees occurring across the site include ash and hawthorn, however non-native trees, including beech, sycamore, larch and lime are also prevalent. Designated also for its beetle assemblage; 16 species of saproxylic beetle have been recorded, and the key woodland habitat components, particularly deadwood habitat, required to support the beetles are present.	Approx. 5.1km north of the Site.	Invasive species, no proactive management.	No further assessment required due to lack of hydrological or habitat connectivity to the Site and no significant impacts as a result of airborne emissions.
Muirkirk Uplands SSSI	Upland habitats within the site consist of heather dominated moorland, acid grassland and blanket bog. Dry heath dominated by heather typifies the moorland on steeper, well-drained slopes. Mosaic of habitats across the site supports a diverse community of moorland breeding and wintering bird populations of national and international significance, notably including hen harrier and short-eared owl. Other bird species characteristic of moorland include peregrine, merlin, buzzard, red grouse, dunlin, snipe, curlew, whinchat, stonechat, wheatear and ring ouzel.	Approx. 11.8km east of the Site.	Burning, over grazing, water management, agricultural operations, development Extraction, game/ fisheries management.	No further assessment required. No qualifying features from the SSSI will be impacted as a result of the Proposed Development. There is a lack of hydrological or habitat connectivity to the Site and no significant impacts as a result of airborne emissions (Chapter 8).
Dalmellington Moss SSSI	The site comprises of an area of raised bog surrounded by a wetland area (lagg fen) developed in the valley of the River Doon. The site is of particular interest as it is considered a rare phenomenon for a raised bog and valley mire to occur side by side within the same flood-plain system.	Approx. 13.9km south of the Site.	Burning, water management, other.	No further assessment required due to lack of hydrological or habitat connectivity to the Site and no significant impacts as a result of airborne emissions.



Table 12.3: Designated Sites Evaluation

Site Name and Status ²	Reason for Designation/identification	Distance from the Proposed Development (km)	Negative Pressures	Further Assessment Required? (Yes/ No and Justification)
	<p>The invertebrates are of special interest, particularly spiders, moths and butterflies and water beetles. Nationally scarce species include the tortrix moth (<i>Olethreutes olivana</i>) and the valerian pug moth (<i>Eupithecia valerianata</i>). Also known to occur is the regionally notable micro-moth (<i>Elachista monosemiella (cerusella)</i>) and the locally rare large heath butterfly (<i>Coenonympha tullia</i>). Sadly, the rare water beetle (<i>Hydroporus elongatulus</i>) has apparently been lost from Sillyhole Moss. This is possibly as a result of enrichment of the lagg of the raised bog. The lagg is the marshland that surrounds the raised bog.</p>			
Bogton Loch SSSI	<p>Bogton Loch, lying less than 1km southwest of Dalmellington, encompasses a freshwater loch and associated wetland habitats, and is one of only two open water transition fens in Ayrshire. The site is also important for the diverse range of birds that breed within the site.</p> <p>The wetland habitats that occupy the transitional area between the open water of the loch and the drier land around it are referred to collectively as ‘open water transition fen’. These habitats grade from swamp and tall-herb fen, through mire (bog), into marshy grassland and willow carr (wet woodland). The wet woodland, comprising mainly willow, with occasional alder and birch, is generally situated along the eastern boundary and adjacent to the banks of the River Doon. The site contains a variety of plant species, including three</p>	Approx. 14.6km south of the Site.	Invasive species, natural events, water management.	No further assessment required due to lack of hydrological or habitat connectivity to the Site and no significant impacts as a result of airborne emissions.



Table 12.3: Designated Sites Evaluation

Site Name and Status ²	Reason for Designation/identification	Distance from the Proposed Development (km)	Negative Pressures	Further Assessment Required? (Yes/ No and Justification)
	<p>notable plants; narrow small-reed, which is nationally rare, and purple small-reed and wood small-reed, which are both locally rare. The site is also notified for its breeding bird community, as the mosaic of wetland habitats support a diverse range of breeding birds.</p>			
<p>Martnaham Loch and Wood SSSI</p>	<p>The site includes a botanically-rich loch and adjacent woodland, the latter being one of the largest oak woods in Ayrshire. The loch supports a range of vegetation types, with submerged, floating and emergent plant communities, and some species of flowering plant not commonly seen elsewhere. Around the loch edge are extensive areas of reed-swamp dominated by common reed but emergent vegetation also includes less common species such as branched burreed, water-plantain, nodding bur-marigold, trifold bur-marigold, greater spearwort, and the nationally scarce eight-stamened waterwort. The marginal vegetation gives way in deeper water to floating plant communities dominated by white and yellow water-lilies. Although not contributing to the SSSI's notified features, a great variety of birds use the loch as a breeding and wintering site.</p>	<p>Approx. 7.7km south west of the Site.</p>	<p>Invasive species (beech, exotic conifers, rhododendron, sycamore), water management, over grazing (deer).</p>	<p>No further assessment required due to lack of hydrological or habitat connectivity to the Site and no significant impacts as a result of airborne emissions.</p>
<p>Ancient woodland 1</p>	<p>Long established plantation origin (LEPO)</p>	<p>Approx. 0.3km north of the Site.</p>	<p>N/A</p>	<p>No further assessment required due to lack of hydrological or habitat connectivity to the Site and</p>



Table 12.3: Designated Sites Evaluation

Site Name and Status ²	Reason for Designation/identification	Distance from the Proposed Development (km)	Negative Pressures	Further Assessment Required? (Yes/ No and Justification)
				no significant impacts as a result of airborne emissions.
Ancient woodland 2	LEPO	Approx. 0.2km north of the Site.	N/A	Yes – potential impacts as a result of airborne emissions.
Ancient woodland 3	LEPO	Approx. 0.5km north east of the Site.	N/A	Yes – potential impacts as a result of airborne emissions.
Ancient woodland 4	LEPO	Approx. 0.7km north of the Site.	N/A	Yes – potential impacts as a result of airborne emissions.
Ancient woodland 5	LEPO	Approx. 1.7km west of the Site.	N/A	No further assessment required due to lack of hydrological or habitat connectivity to the Site and no significant impacts as a result of airborne emissions.

Notable Habitats: Standing Water

12.4.3 The Site contains a single waterbody in the form of a drainage ditch which may offer suitable habitat for invertebrate species and amphibians including common toad (*Bufo bufo*), common frog (*Rana temporaria*), palmate newt (*Lissotriton helveticus*) and smooth newt (*Lissotriton vulgaris*). Poor semi-improved grassland habitat within the survey boundary provides some limited suitable foraging habitat for amphibians.

Protected Species: Breeding Birds

12.4.4 Scattered immature trees and species poor hedgerow offer some limited habitat which could be utilised by common nesting bird species. The buildings on Site could also be utilised by species such as swallows (*Hirundo rustica*).

Limitations

12.4.5 Ecological surveys are limited by factors that affect the presence of plants and animals such as time of year, weather, migration patterns and behaviour. The survey was undertaken in August which is within the main flowering season for plant species and provides a representative sample of species on site. However, survey data provides a snapshot in time therefore not all species present on site may have been present during the time of survey.

12.4.6 The absence of desk study records cannot be relied upon to reliably infer absence of a species/habitat. Often, the absence of records is a result of under-recording within the given search area.

12.4.7 Access permission was not provided for land outside the Site boundary. Certain limitations are described in the associated PEA, none of which are considered to constrain the assessment.

12.4.8 Despite the limitations, it is considered that there is sufficient information to enable an informed decision to be taken in relation to the identification and assessment of likely significant environmental impacts on ecology.

12.5 Assessment of Effects

Designated Sites: Airds Moss Special Area of Conservation (SAC) and Muirkirk and North Lowther Uplands Special Protection Area (SPA)

12.5.1 Airds Moss SAC is located approximately 11km to the east and Muirkirk and North Lowther SPA is located approximately 10km to the east of the Site respectively.

12.5.2 Air quality modelling (further details available in Chapter 8) has shown that the identified European sites are located at distances great enough from the ERP that they would not be significantly impacted by the deposition of ammonia, acid or nitrogen deposition; any impacts of ammonia, acid or nitrogen deposition at the identified European sites are minimal and well below 1% of the critical levels/loads. Therefore, there will be **no significant adverse** impact on Airds Moss SAC or the Muirkirk and North Lowther SPA as a result of ammonia, acid or nitrogen deposition. Confidence in this assessment is **High** as both designated areas are outwith the ammonia, acid or nitrogen deposition zones (See Chapter 8).

Designated Sites: Barlosh Moss SSSI

12.5.3 There is no ecological or hydrological connectivity from the Site to Barlosh Moss. The air quality assessment (Chapter 8) has determined that the background levels of pollutants exceed the critical levels/ loads for annual mean ammonia, acid and nitrogen deposition at the eastern section of the SSSI. Bogs are particularly sensitive to atmospheric pollution, in particular nitrogen oxides and ammonia, due to their ombrotrophic nature, and impacts can include a decline in species richness due to loss of rarer species and structural change to habitat, as well as increased nitrogen within the peat and associated water.

12.5.4 It is possible that Barlosh Moss SSSI, which is currently exposed to large exceedances of the critical load in ammonia, acid deposition and nitrogen deposition due to high background levels, may have developed a bog community composition which is more resilient to minor incremental changes in pollutant levels. The annual change in pollutant levels as a result of the Proposed Development in the eastern section of Barlosh Moss will be 1.49% over the screening criteria for nitrogen deposition and 1.71% for acid deposition. The effect at the SSSI area itself is not well understood however, and although small changes in vegetation composition may occur over time, as the current vegetation communities have developed under levels of background pollutants exceeding critical loads. It can be reasonably assumed that such communities have developed a degree of tolerance to ammonia, acid deposition and nitrogen deposition. The impact of air emissions on Barlosh Moss SSSI is assessed to be of **low magnitude, permanent and irreversible**. The impact of air quality emissions on Barlosh Moss SSSI is therefore assessed as **non-significant adverse** at a **Local level**. Confidence in this assessment is **Moderate** due to lack of current botanical survey data for Barlosh Moss SSSI.

Designated Sites: Burnnock Water LWS

- 12.5.5 The Burnnock Water LWS is located approximately 1.7km east of the Site. It is formed of semi-natural gorge woodland plus areas of gorse/broom scrub, old coppiced hazel woodland and small areas of semi-improved grassland. There is no ecological or hydrological connectivity from the Site to Burnnock Water. The air quality assessment (Chapter 8) has determined that the distribution of pollutants has exceeded the critical levels/ loads for annual mean ammonia and nitrogen deposition.
- 12.5.6 In woodland, elevated nitrogen deposition in general has driven strong biogeochemical responses, with research showing that reductions in soil carbon-nitrogen ratio, acidification and increased nitrate leaching (CIEEM, 2021). Understorey plants can also be negatively affected by nitrogen inputs. However, the impact of nitrogen deposition on vegetation composition of woodlands is poorly understood, partly due to the strong confounding influence that tree canopy structure places on ground flora species richness, cover and other parameters that might otherwise enable the effects of nitrogen deposition to be discerned (CIEEM, 2021).
- 12.5.7 Due to high background levels of the pollutants however, the habitats are currently exposed to large exceedances of the critical load in nitrogen deposition. Therefore, the habitats and species composition present within the Burnnock Water LWS may have changed over time to include species less sensitive to nitrogen and ammonia deposition present within the background levels. As such, the species present are likely to be more resilient to minor incremental changes in pollutant levels as a result of the Proposed Development. The annual changes in nitrogen deposition levels as a result of the Proposed Development will be 1.91% over the screening criteria for broadleaved deciduous woodland and 2.4% for alpine grasslands. The annual change in acid deposition levels as a result of the Proposed Development will be 1.41% over the screening criteria for broadleaved woodland and 0.99% for alpine grassland. The impact is therefore assessed to be of **low magnitude, permanent and irreversible**. The impact of air quality emissions on the Burnnock Water LWS is therefore assessed as **non-significant adverse** at a **Local level**. Confidence in this assessment is **Moderate** due to lack of current botanical survey data from the Burnnock Water LWS.

Designated Areas: Ancient Woodland (LEPO)

- 12.5.8 Five un-named areas of ancient woodland (LEPO) are present within 2km of the Site. There is no ecological or hydrological connectivity from the Site to these LEPO woodlands. The air quality assessment (Chapter 8) has determined that three of these

woodlands are located within areas where the background levels of pollutants exceed the critical levels/ loads for annual mean ammonia, acid and nitrogen deposition. As described in Section 12.5.7, the impact of nitrogen deposition on woodland is poorly understood.

12.5.9 As these areas are comprised of LEPO woodland/plantation which originate on ancient woodland soils, these habitats are less likely to support significant communities of bryophytes and lichens which are more sensitive to such pollutants. Each of the three un-named LEPO woodlands is surrounded by farmland and as such will be influenced by arable and pastoral farming practices adjacent to the woodland. Due to high background levels of the airborne pollutants being present these areas are likely to include species less sensitive to nitrogen and ammonia deposition present within the background levels. As such, the species present are likely to be more resilient to minor incremental changes in pollutant levels as a result of the Proposed Development. The annual changes in nitrogen deposition levels as a result of the Proposed Development will be 7.09%, 5.10% and 2.60% over the screening criteria respectively for each of the three woodlands. The impact is assessed to be of **low magnitude, permanent and irreversible**. The impact of air quality emissions on the LEPO woodlands is therefore assessed as **non-significant adverse** at a **Local level**. Confidence in this assessment is **Moderate** due to lack of current botanical survey data from the LEPO woodlands.

Notable Habitats: Standing Water

12.5.10 The standing water habitat within the Site which may offer supporting habitat for amphibians and invertebrates, however it was deemed to be unsuitable for Great crested newts. This water body will be permanently lost due to the Proposed Development. This may result in the displacement of species into adjacent habitats. Although standing water is a priority habitat, and is to be lost as part of the Proposed Development, this occupies a small area of the Site, and direct or indirect impacts on associated species will be avoided by working in accordance with the agreed Precautionary Working Method Statement (PWMS) detailed in Appendix 12.1: Due to the presence of a further 10 water bodies within 500m of the Site offering suitable habitat for invertebrate and amphibian species, the impact of the loss of this drainage channel is deemed to be of **low magnitude, permanent and irreversible**. The loss of standing water habitats is **non-significant at a Site level**. Confidence in this assessment is **High**.

Protected Species: Breeding Birds.

12.5.11 Although the existing trees within the Site are proposed to be retained as part of the Proposed Development, some of the supporting breeding habitats for certain bird species, including hedgerow habitats, may be lost to the Proposed Development. All buildings offering nesting habitat will be retained as part of the Proposed Development. If any hedgerow or tree habitat is lost as part of the Proposed Development, this may result in loss of small areas of suitable nesting and foraging habitat for some bird species and the displacement of individuals into adjacent habitats. The impact will be of **low magnitude**, is **permanent** and **irreversible**. Other species for which local records were identified during the survey, such as pink-footed goose (*Anser brachyrhynchus*) and kingfisher (*Alcedo atthis*), do not utilise habitats such as those recorded on the Site and subsequently will not be directly affected by the Proposed Development.

12.5.12 As part of the Proposed Development, planting of additional tree and shrub habitat along the embankment will be undertaken. This is embedded mitigation as part of the general site design and layout and will include the following species: Beech (*Fagus*), Scots Pine (*Pinus sylvestris*), Holm Oak (*Quercus ilex*), as well as Common Hazel (*Corylus avellana*), European spindle (*Euonymus europaeus*), Holly 'Pyramidalis (*Ilex Aquifolium*)', Dog rose (*Rosa canina*), and Guelder rose (*Viburnum opulus*). Ornamental shrubs have also been proposed toward the end of the access road, with the 'Sweetbox' shrub. Grass seeding mix has been proposed site-wide, with the Scottish native mix 'Mavisbank Mix' by Scotia Seeds. Native 'Wet Meadow Mix' by Scotia Seeds has been proposed for the drainage basins, which are set out according to Engineer's details (see Drainage Strategy, Appendix 11.4 of the EIAR). As such, planting as part of the Proposed Development will increase the habitat for breeding birds within the Site. The loss of breeding bird habitat is therefore assessed as **non-significant adverse** at a **Site level**. Confidence in this assessment is **High**.

12.6 Mitigation

12.6.1 This section identifies mitigation measures required to achieve legal compliance and avoid, reduce or compensate for adverse impacts.

Breeding Birds

12.6.2 As no significant adverse effects on breeding birds have been identified, mitigation is not required however the habitats recorded within the survey area provide limited potential nesting habitat for common bird species. To ensure legal compliance it will be necessary to prevent harm to active birds' nests.

12.6.3 In order to avoid committing an offence under the relevant wildlife legislation it is recommended that all vegetation clearance works aim to avoid the breeding bird season (March – September).

12.6.4 Should it prove necessary to carry out vegetation clearance works within the breeding bird season, mitigation will include:

- A thorough check by a suitably qualified ecologist, for the presence of nesting birds within 24 hours of works commencing.
- In the event that nesting birds are recorded within the works area the active nest(s) will be retained undisturbed and protected by a buffer of at least 5m of uncut vegetation.
- Habitat clearance works will re-commence when the nesting attempt is complete, and the nest is confirmed by a suitably qualified ecologist to be inactive/disused.

Standing Water

12.6.5 The drainage ditch and bank vegetation on Site is to be lost to the Proposed Development. The ditch offers suitable habitat for invertebrate species and common frog, common toad, smooth newt and palmate newt, and there is some limited suitable terrestrial habitat within the Site boundaries. In addition, the ponds and terrestrial habitat to the west of the Site are suitable for these species.

12.6.6 To avoid incidental harm, the vegetation clearance and infilling of the drainage ditch will be completed in accordance with a PWMS, included in Appendix 12.1. This includes the following actions: Prior to infilling, a toolbox talk will be delivered to all operatives. A hand search for amphibians will be carried out prior to vegetation clearance. Vegetation clearance will be supervised by an Ecologist and any amphibians caught during the clearance will be translocated to adjacent waterbodies.

12.7 Residual Effects

12.7.1 Subject to the mitigation measures outlined above being implemented, no significant residual adverse effects are anticipated upon IEFs.

12.8 Summary of Effects

12.8.1 A summary of the residual effects is provided in Table 12.4.



Table 12.4: Summary of IEFs, Likely Significant Effects, Mitigation Measures, and Residual Effects

IEF	Potential Impacts	Impact assessment	Mitigation Measures	Residual Effects
Airds Moss Special Area of Conservation (SAC)	Air quality: ammonia, acid and nitrogen deposition	No significant impact.	N/A	None
Muirkirk and North Lowther Uplands Special Protection Area (SPA)		No significant impact.	N/A	None
Barlosh Moss SSSI		No significant impact.	N/A	None
Burnock Water LWS		No significant impact.	N/A	None
Ancient Woodland (LEPO)		No significant impact.	N/A	None
Notable Habitats: Standing Water	Habitat loss	No significant impact.	Implementation of Precautionary Working Method Statement (to provide precautionary guidance to achieve legal compliance.	None.
Protected Species: Breeding Birds.	Habitat loss Disturbance during the breeding season.	No significant impact.	Precautionary guidance provided with regards to sensitive timing of vegetation clearance.	None.

12.9 Assessment of Cumulative Effects

12.9.1 The Proposed Development will not have a significant impact on the ecological features associated with the Site. The East Ayrshire Local Development Plan (2017) was consulted to identify key strategic and significant proposed developments within the local authority area. The HRA for the local plan has concluded that there are no likely significant effects or in-combination effects as a result of the implementation of the local plan.

12.9.2 In addition, a total of nine other schemes are located within 10km of the Proposed Development and were considered within the cumulative assessment, which include five consented and proposed wind energy developments, two industrial developments, one substation and one pithead development. As there are no significant impacts on designated sites, habitats or species predicted from the Proposed Development, and there is no hydrological or habitat connectivity from the Proposed Development to the other schemes there will be no significant cumulative effects.

12.9.3 The assessment has concluded that there will be no significant adverse impacts as a result of the Proposed Development either on it's own or in combination with other developments.

12.10 Differences between the Consented and Proposed Development

12.10.1 The EIA undertaken for the previous application found there to be no significant impacts of the scheme on designated sites, habitats or protected species. As such the assessments for the consented and Proposed Development have both concluded there to be no significant impacts on ecology from the development of the site.

12.11 Summary

12.11.1 An ecological impact assessment was undertaken in line with current legislation, policy and best practice guidelines to identify potential significant impacts as a result of the Proposed Development of an Energy from Waste facility at Killoch, East Ayrshire.

12.11.2 The following potentially sensitive receptors were identified for consideration within this Chapter:

- Two nationally and locally designated areas for nature conservation (Barlosh Moss Site of SSSI and LWS and Burnock Water LWS) and three un-named ancient woodlands of long-established plantation origins were assessed for potential impacts as a result of ammonia, acid and nitrogen deposition. The assessment concluded that back-ground levels were elevated, therefore there would be no significant impact on these designates areas as a result of the Proposed Development.
- A small area of standing water within the Proposed Development boundary was assessed due to habitat loss. The assessment concluded that although this water body would be lost, there is similar habitat present within 500m of the Proposed Development, therefore the impact was not significant. However, as a precaution, a Precautionary Working Method Statement has been produced to provide precautionary guidance to achieve legal compliance.
- The potential for habitat loss and disturbance to breeding birds was assessed. The assessment concluded that the habitats on site were sub-optimal for breeding birds, therefore there would be no significant impact on these species. Precautionary mitigation guidance has been provided with regards to sensitive timing of vegetation clearance to avoid breeding bird season where possible.