



Maes y Droell Quarry

Ecological Impact Assessment (EcIA)

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1 Summary

An Ecological Impact Assessment (EclA) of the proposed quarrying and restoration works at Maes y Droell in Denbighshire has been undertaken by SK Environmental Solutions Ltd (SKE). This assessment covers the quarrying works themselves, as well as the full restoration carried out following the cessation of quarrying activities.

The Site is approximately centred at Ordnance Survey (OS) Grid Reference SJ 21789 56529. It is divided into northern and southern parcels by bridleway ref 515/17, which connects Eryrys Road to the west with Llynwern Road to the east. The southern part has been quarried in the recent past and is largely covered in early successional habitat, with the exception of some remnant woodland habitats. The northern parcel has historically been part of a lead mine and contains more upland habitat types. A number of ponds are present across both parts of the site. The proposed development comprises the extraction of high-grade industrial sand followed by the progressive restoration of the site and will involve the removal of nearly all habitats on site, with the exception of a strip of woodland along the eastern edge of the site, a field at the northern end of the southern parcel and a small area at the southern tip of the southern part of the Site.

There are six statutory designated sites located within 5km of the Site, all over 1km away. There are also twenty-four non-statutory designated sites within 2km, some partially or wholly located within the site.

A UK Habitat Classification (UKHab) Survey and desk study were undertaken in April and June 2026, respectively, to determine the potential for notable/protected species and habitats within the Site and the surrounding area.

The statutory designated sites located within 5km of the proposed site, the non-statutory designated sites within 2km, habitats within the site, amphibians, reptiles, bats, otter and badger are all considered to be Valued Ecological Receptors (VERs) as they are deemed to be important at a local level or higher.

In-built mitigation has been incorporated into the proposed development to ensure VERs are safeguarded during the proposed development and to provide a net benefit for biodiversity through habitat creation and enhancement; this is consistent with local and national planning policies and advice.

It is anticipated that the restoration process will reinstate suitable habitats on site and ensure their management and monitoring for the species present, most importantly great crested newts, reptiles and bats. This will prevent natural successional processes. Works to relocate GCN within the Site will need to be carried out under the provisions of a European Protected Species license granted by Natural Resources Wales. Other mitigation, avoidance and compensation measures are also provided in order to minimise impacts and a series of enhancement measures is also incorporated.

It is anticipated that there will be no significant effects arising as a result of the quarry and restoration works in relation to nature conservation in the long term.

2 Introduction

This Ecological Impact Assessment (EcIA) covers the assessment of likely significant effects on ecology and nature conservation arising as a result of the proposed works at Maes y Droell quarry in Denbighshire, Wales.

This report has been prepared by SK Environmental Solutions Limited (SKE) in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. The content is compliant with British Standard BS42020: 2013 Biodiversity Code of Practice for Planning and Development.

The EcIA describes the assessment methodology, which includes a summary of the baseline conditions for the proposed quarry (hereafter referred to as 'the Site') and immediate surroundings, the value of the ecological resources, the mitigation measures and biodiversity enhancements built into the proposal and the likely significant effects associated with it, after these measures have been applied.

Site Description

The quarry is situated adjacent to the village of Graianrhyd, located off the B5430 running east from Llanarmon-yn-Ial. It is approximately 6.6km south-west of the town of Mold. The central grid reference for the site is Ordnance Survey (OS) Grid Reference SJ 21789 56529 (approximate).

A currently inactive industrial sand quarry, the site broadly comprises two parcels of land (the northern parcel and the southern parcel) divided by a public bridleway. The main quarry area forms the larger, southern parcel while the smaller northern parcel comprises an area of previously disturbed ground and includes several settling lagoons. The habitats across both parcels are varied, with areas of bare ground, colonising vegetation, scrub (particularly gorse), bracken and woodland, along with ponds / lagoons.

The surrounding landscape is dominated by agricultural grazing pasture with occasional areas of scrub and woodland. The larger Graig Quarry is located approximately 1km west of the site.

Proposals

The Proposed Development comprises the extraction of high-grade industrial sand followed by the progressive restoration of the Site within the previously operational quarry and extension of the quarry into the undeveloped/unquarried northern area. Access to the Site is at Grid Ref SJ216565 on the minor road from Graianrhyd to Eryrys.

Quarrying activity will be phased, with restoration of the site also taking part in phases. Four separate phases are currently planned, running from south to north. For details on the landscape phasing plans and final restoration proposals, see ES Vol IV:

Figure 1: Site Location Plan

Figure 2: Aerial context plan

Figure 3: Phase 1 Indicative Quarry Development Plan

Figure 4: Phase 2 Indicative Quarry Development Plan

Figure 5: Phase 3 Indicative Quarry Development Plan

Figure 6: Phase 4 Indicative Quarry Development Plan

Figure 7: Restoration Indicative Quarry Development Plan

3 Assessment Methodology

Ecological receptors, including designated sites and protected/notable habitats and species, which could be affected by the Proposed Development have been identified through a desk-based assessment of available records, published sources and ecological survey work. From this information, the potential 'Ecological Zone of Influence' (EZoI) relating to the Proposed Development has been established.

The assessment has been undertaken in accordance with the Chartered Institute for Ecology and Environmental Management (CIEEM) guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, Version 1.3 updated September 2024) and British Standards for Biodiversity Code of Practice for Planning and Development BS4202013 (BSI Standards Limited, 2013).

Baseline Methodology

Study Area

The proposed quarry area is defined by the application red-line boundary and shown below on figure 1.



Figure 1: Site Location Plan

It encompasses previously quarried land, alongside an extension to the north, which historic mapping shows formed part of Llarnarmon Lead Mine from the 1830s. The southern parcel was already in use as a quarry on the First Edition Ordnance Survey mapping and included several built structures by around 1900.

To inform the scope of the assessment, consideration has been given to the Ecological Zone of Influence (EZoI) of the Proposed Development. The EZoI is defined as an area over which important ecological features may be affected as a result of biophysical changes caused by the Proposed

Development and associated activities. The extent of such changes will typically reduce as the distance from the Proposed Development increases, and whether effects are experienced is dependent on the sensitivity of individual habitats, species or other ecological features. As such, it is problematic to define a specific EZol which captures all potential effects arising from the Proposed Development on all ecological features that may be present, and different search areas/study areas have been used for different species/habitats. The EZol for the ecological features, which were subject to specific desktop or site survey work, are set out below.

The UK Habitat Classification Survey (UKHab), completed on 23rd of April 2026, covers the Site.

Ecological Zones of Influence

- Statutory designated sites within 5km of the Site;
- Non-statutory designated sites within 2km of the Site;
- Records search for protected/notable habitats and species within 2km of the Site; and
- UKHab Survey – the Site.
- Protected species – the Site.

Desk Study

A desktop study was undertaken in June 2026 by SKE. The desk study involved conducting database searches for statutory and non-statutory designated sites, including Ramsar sites, Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs), as well as other features of interest located within and surrounding the Site.

The baseline conditions are based on a review of existing available information, which included the following:

- Multi-Agency Geographical Information for the Countryside (MAGIC) website (to identify statutory designated sites located within 5km of the site);
- Ordnance survey mapping, including historic maps (to identify potentially notable habitats and past land use);
- Aerial photography (to identify potentially notable habitats and past land use);
- The Woodland Trust database of notable, veteran and ancient trees;
- UK Biodiversity Action Plan;
- Nature Recovery Action Plan being developed by Bionet, the local nature partnership (outlining the aims and objectives for the habitats and species found in the local area);
- Consultation Data (including records of protected / notable species and habitats and non-statutory sites within 2km of the site) provided by Cofnod, the north Wales environmental records centre); and
- It was not possible to identify nearby schemes which may cause cumulative impacts via the Denbighshire Council planning portal, as there is no map search available.

Field Survey

SKE undertook a UKHab Survey of the site on 23rd and 24th of April 2026.

The UKHab is a habitat classification system for the UK that has been developed to provide a rapid system for recording and classifying habitats which can be used for field-based surveys. It is intended to assist ecologists to identify and map habitats in a consistent and unified way and has been designed

to provide outputs that are suitable for ecological impact assessment, habitat metrics and better data integration and sharing between organisations.

The field survey broadly followed the methodology as set out in Data Collection and Mapping, Chapter 3 of 'The UK Habitat Classification User Manual, Version 2.01' and The Chartered Institute of Ecology and Environmental Management's (CIEEM's) Guidelines for Preliminary Ecological Appraisal (2013). It provides information on the habitats within the survey area as well as identifying the actual or potential presence of legally protected or otherwise notable species in or immediately adjacent to the site. The main habitats within the site were mapped and are shown at an appropriate scale on JN00842/DW09 (Whole Site), JN00777/DW10 (North Site) and JN00777/DW11 (south Site) – Habitat Plans.

Target Notes were taken to provide a more detailed description of a particular habitat in terms of species composition or as a means of highlighting a particular feature of ecological interest; these are provided in Appendix 1.

Plant names follow 'New Flora of the British Isles' (Stace, 2019). The common and scientific names of all botanical species identified are provided when first mentioned in the text, but only the common name is stated thereafter.

In addition to establishing the baseline ecological interest within the site, the survey also identified areas where further surveys may be required during the appropriate season for legally protected or notable species.

Hazel Dormouse

A separate walkover survey was carried out to assess the potential of the habitats on site for hazel dormouse *Muscardinus avellanarius*. This included an assessment of the type of scrub and woodland present, the amount of hazel stock within the site and spot checks of opened hazel nuts for characteristic gnawing patterns, as well as a search for nests.

Ground Level Tree Assessment for Roosting Bats

A ground level tree assessment for roosting bats was undertaken on 12th May 2026. This only covered the trees alongside the proposed visibility splay to the north of the proposed access, as these will need to be removed at the beginning of works to facilitate safe access. Tree removal within site will be carried out in line with the phasing plan and it will therefore be necessary to carry out surveys for bats in trees closer to the time of felling, in order to accurately assess impacts and whether it will be necessary to carry out works under a license. Due to the number of trees present on site, it is likely that at least some roosts are present.

Trees along the visibility splay were assessed for their potential to support roosting bats following BCT Bat Surveys – Good Practice Guidelines (4th Edition, 2023) and Bat Tree Habitat Key. The trees and their potential roost features (PRFs) were classified as per Table 1 below.

Table 1: Tree classification system (BCT 2023)

Suitability	Description of roosting habitats
Negligible	Negligible habitat features that could be used by roosting bats.
PRF - I	A PRF is only suitable for individual bat use, or very small numbers of bats, either due to size or lack of suitable surrounding habitat.
PRF - M	A PRF is suitable to multiple bats and may be, therefore, used as a maternity colony.

Visual Survey for Badgers

The Site was systematically surveyed for evidence of badgers, in the form of:

- Setts - comprising either single isolated holes or a series of holes, which may be link to each other underground;
- Faeces - badgers deposit faeces in characteristic excavated pits, concentrations of which (latrine sites) are typically found at home range boundaries, field boundaries and around setts;
- Paths - worn paths used by badger, often linked to setts or foraging grounds;
- Scratching posts - typically at the base of tree trunks;
- Snuffle holes - scrapes where badgers have searched for food;
- Day nests - bundles of grass and other vegetation where badgers may sleep above ground; and
- Hairs - usually found outside setts or caught under fencing.

Where badger setts were found, evidence was recorded as follows:

- Number of well-used holes - one or more of the features: well-worn entrance; freshly excavated soil; and bedding material;
- Number of partially used holes - leaves or twigs in entrance and/or mosses and other plants growing in or around entrance;
- Number of disused holes - partially or completely blocked, with considerable amount of excavation required for reoccupation; and
- The presence of cobwebs, leaf litter, droppings, footprints and hair in the immediate vicinity and at the opening.

Where feasible, badger setts were broadly categorised in accordance with *The classification of badger Meles meles setts in the UK: A review and Guidance for Surveyors* (Andrews R. (2013)):

- Main sett - continuously used, breeding and over-wintering sett for a social group of badgers. Only one main sett will exist in each social group's territory, and will be relatively centrally located within the group's range;
- Annexe sett - annexe of the main sett, linked by well-used paths to the main sett (but not connected underground) and not continuously used;
- Subsidiary sett - distant from the main sett. Several entrances, but with no well-used paths connecting to the main sett, and only used seasonally; and
- Outlier sett - distant from the main sett. Small, with only one of two entrances only. Used for short periods sporadically, with no obvious, well-used paths connecting to other setts.

Limitations

It should be noted that the data search and site survey provided information on habitats and species recorded at discrete points in time and cannot be taken to represent a complete overview of all species present in the survey area. It is considered that the historic records, coupled with the site visit, provide a robust review of the potential presence of various notable/protected species and habitat types at the site. This has allowed a general assessment of the site's potential nature conservation value to be made and therefore this was not considered to be a significant limitation.

The UKHab Survey was undertaken in April 2026, which is considered to be an optimum time of year for surveys involving woodland and scrub habitats, while less optimal for grassland habitat. Seasonal trends and inherent variations in ecosystem dynamics mean that some species of flora and fauna may

not have been recorded. However, the purpose of the survey was to record habitat types and therefore this was not considered to be a significant limitation.

Previous survey information for the site was available from a variety of sources beyond the site surveys and data search. RammSanderson have carried out surveys on the site and provided survey data and summary letter reports. Survey work carried out in 2026 by SK Environmental Services Ltd. was designed to identify and fill in gaps in understanding of the ecology of the site, survey therefore deviated from standard protocols when it comes to great crested newts *Triturus cristatus* in particular, with only three overnight surveys being carried out, however a full population class size assessment was carried out in 2025. The level of survey work carried out for this species in 2026 was discussed and agreed with Matt Ellis at Natural Resources Wales.

Regrettably, Denbighshire County Council does not include a map search within its planning portal functionality, meaning it was not possible to identify nearby schemes which may cause cumulative impacts.

3.1.1 Assessment Criteria and Assignment of Significance

Valuation

The evaluation of ecological features and resources has been based on sound professional judgement whilst also drawing on the latest available industry guidance and research. The approach taken in this report is based on that described in 'Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal' published by the Chartered Institute of Ecology and Environmental Management (CIEEM, Version 1.3 updated September 2024), whereby important ecological features are identified, and these are considered within a defined geographical context using the following frame of reference:

- International;
- UK;
- National (i.e. England);
- Regional;
- County;
- District;
- Local; and
- Neighbourhood (site and its vicinity, including areas of habitats contiguous with or linked to those on site).

The valuation of sites makes use of established value systems e.g. Sites of Special Scientific Interest are of national importance and Sites of Importance for Nature Conservation are of county importance. Professional judgement is however required for the valuation of sites of less than district value.

The valuation of species populations, assemblages of species and habitats also use accepted criteria, examples include:

- Species populations: the importance of populations can be evaluated on the basis of their size, recognised status (e.g. published lists of species of conservation concern, Biodiversity Action Plan (BAP) status) and legal protection status. Bird populations, for example, exceeding 1% of published bio-geographic populations are considered to be of international importance, and those exceeding 1% of published national populations are considered to be of national importance, and so forth.

- Species assemblages: in some instances, it is the species assemblage that is of importance. Criteria of use to evaluate the importance of assemblages included SSSI selection criteria. Fuller (1980) provides a framework for evaluating the relative importance of bird assemblages.
- Habitats: criteria for the evaluation of habitats and plant communities include Annex III of the EC Habitats Directive, guidelines for the selection of biological SSSIs and, where available, Local Authority criteria for the selection of Local Sites (e.g. County Wildlife Sites). Legal protection status is also a consideration for certain habitats.

In this assessment, designated sites, species and habitats are considered to be Valued Ecological Receptors (VER) if they meet the following minimum level of importance:

- **Sites** – local importance
- **Species** – local importance
- **Habitats** – local importance

Any potential impacts to identified VERs will be fully considered within this assessment. Any ecological features that do not meet the VER criteria, above, will be scoped out of the assessment. This is because it is considered that no significant effect can occur to features of less than local importance, except where a feature has high social or economic value.

The description and valuation of ecological features have taken account of any likely changes, including, for example, trends in the population size or distribution of species; likely changes to the extent of habitats; and the effects of other proposed developments or land-use changes.

Identification and Magnitude of Impacts

The CIEEM guidance also sets out a methodology for the assessment of likely impacts arising from proposed developments. The method used in this assessment is based on the CIEEM guidance and the *British Standards for Biodiversity: Code of Practice for Planning and Development (BS42020:2013)*, is summarised below.

Based on the parameters of the Proposed Development, likely impacts have been determined with reference to aspects of the ecological structure and function on which the feature or resource depends. This includes factors such as the available resources, ecological processes, human influences, historical context, ecological relationships, ecological role or function and ecosystem properties. In this context, the nature of the impact has been characterised and considered using the following parameters set out in the CIEEM guidance:

- **Positive or negative** – will the activity lead to a beneficial or an adverse effect;
- **Extent** – the spatial or geographical area over which the impact may occur, the area of habitat or number of individuals affected;
- **Magnitude** – this refers to size, amount, intensity and volume, and should be expressed as quantitatively as possible;
- **Duration** – the time for which the impact is expected to last prior to recovery or replacement, i.e. short-term or long-term, as defined in relation to ecological characteristics (such as a species' lifecycle);
- **Frequency and Timing** – some changes may only cause an impact if they coincide with critical life-stages or seasons, whilst frequent events may cause a greater effect than a single event; and
- **Reversibility** – an effect may be irreversible in that recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it, i.e. permanent or temporary.

Based on the parameters outlined above, a broad scale has been produced using the terminology summarised in Table 2 (below).

Table 2: Definition of Magnitude

Magnitude	Definition
High	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse).
	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).
Medium	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements (Adverse).
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
Low	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse).
	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse).
	Very minor benefit to or positive addition of one or more characteristics, features or elements (Beneficial).
No Change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Significance of Effects

The effect is the term used to express the consequence of an impact (expressed as the significance of effect), which is determined by correlating the magnitude of the impact to the value of the receptor.

The CIEEM Guidance defines a 'significant effect' as:

"an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general", [going on to state that] "significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)."

For habitat areas and species, an effect is considered to be significantly adverse if the favourable conservation status of a VER is compromised as a result of the proposed development. Conservation status is defined by CIEEM as being:

- **Habitats** – "conservation status is determined by the sum of the influences acting on the habitat and its typical species that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area".
- **Species** – "conservation status is determined by the sum of the influences acting on the species

concerned that may affect the long-term distribution and abundance of its populations within a given geographical area”.

The decision as to whether the favourable conservation status of a VER is likely to be compromised is made using professional judgement based on an analysis of the predicted effects of the development.

A similar process is used for designated sites that could be affected by the Proposed Development, except that the focus is on the effects on the integrity of each site, defined as “*the coherence of ecological structure and function, across a site’s whole area, that enable it to sustain the habitat, complex of habitats and/or levels of populations of species for which it was classified.*” This assessment is made with reference to the features for which a site has been classified/notified and involves combining assessments of the effects on the conservation status of each of these features.

For non-statutory designated sites, such features may not have been formally defined and will need to be agreed with the designating authority (e.g. local authority or county wildlife trust).

An effect is considered to be significantly beneficial if development activities cause:

- A non-valued ecological receptor to become valued;
- Restoration of favourable conservation status for a habitat/species population; and/or,
- Restoration of a site’s integrity (where this has been previously undermined).

4 Legislative Framework

National Legislation

The following legislation and guidance documents have been used to underpin the ecological impact assessment reported in this Section:

- The Conservation of Habitats and Species Regulations 2017 (as amended);
- Bern Convention (on the Conservation of European Wildlife & Natural Habitats; and on the Conservation of Migratory Species of Wild Animals) 1979;
- The Conservation of Habitats and Species Regulations 2010;
- The Birds Directive 2009;
- Wildlife & Countryside Act 1981 (and subsequent amendments);
- Countryside and Rights of Way Act 2000;
- Environment (Wales) Act 2016. Section 7 includes lists of habitats and species recognised as of 'principal importance' for the conservation of biodiversity. Section 6 requires all public authority to seek to maintain and enhance biodiversity in the exercise of functions in relation to Wales;
- Planning Policy Wales (Edition 12) 2024;
- Protection of Badgers Act 1992;
- The Hedgerow Regulations 1997.
- Future Wales: The National Plan 2040 (adopted February 2021);

Local development plan policy

The Denbighshire County Council Local Development Plan 2006 – 2021 (Adopted June 2013)

Relevant policies from the Denbighshire Local Development Plan 2006-2021 include:

- Policy RD1 Sustainable development and good standard design. Sustainable development and good standard design, part xiii) Incorporates suitable landscaping measures, including where appropriate hard and soft landscaping treatment, the creation and/or protection of green and blue corridors, mature landscaping, and arrangements for subsequent maintenance. Landscaping should create a visually pleasant, sustainable and biodiversity rich environment that protects and enhances existing landscape features and also creates new features and areas of open space that reflect local character and sense of place;
- Policy VOE5 Conservation of natural resources
- Policy PSE15 Safeguarding minerals
- Policy PSE16 Mineral buffer zones
- Policy PSE17 Future mineral extraction

Technical Advice Notes (TANs)

(TAN 5) Nature Conservation and Planning. Provides advice about how the land use planning system should contribute to protecting and enhancing biodiversity and ecological conservation. It seeks to demonstrate how local planning authorities, developers and key stakeholders in conservation can work together to deliver more sustainable development that does not result in losses to natural heritage but instead takes opportunities to enhance it.

Supplementary Planning Guidance (SPG)

Conservation and Enhancement of Biodiversity The Denbighshire Conservation and Enhancement of Biodiversity Supplementary Planning Guidance (SPG) provides guidance on protecting and enhancing biodiversity through the planning process. It supports national policy and the Local Development Plan by promoting the conservation of habitats, protected species and wider ecological networks

Local Policy

Denbighshire's Local Development Plan LDP is currently in the process of being updated, at present the former plan (2006-2021) includes provisions for the sustainable extraction of aggregates including sand. It does not currently include Maes-y-Droell. The county's strategy is part of a North Wales-wide strategy in order to allocate extraction permissions. Objective 9 of the LDP states:

"The Local Development Plan will seek to meet its local and regional mineral needs in the most sustainable manner." "The Local Development Plan will steer new mineral extraction away from the AONB and AOB and seek to ensure that future mineral extraction is necessary, and contributes towards meeting regional and local demand. The North Wales Regional Aggregate Working Party has identified a need for Denbighshire County Council to make provision for additional sand and gravel extraction over the life of the Local Development Plan and to safeguard limestone and sand and gravel deposits within the County for future generations."

Policy PSE15 - Safeguarding Minerals states that:

"High quality resources of minerals, including limestone, sand and gravel, Denbigh Gritstones, igneous and volcanic deposits will be safeguarded from development that would result in its permanent loss or hinder future extraction. Development will only be permitted where: 60 i) it can be demonstrated that the need for the development outweighs the need to protect the mineral resource; or ii) where such development would not have a significant impact on the viability of that mineral being worked; or iii) where the mineral is extracted prior to the development."

Policy PSE17 – Future mineral extraction states that:

- i) Application for the working of minerals within the Area of Outstanding Natural Beauty will not be permitted unless exceptional circumstances can be demonstrated.
- ii) Applications for the extraction of aggregate minerals will only be permitted where it is necessary to maintain stocks of permitted reserves having regard to the Regional Aggregate Working Party apportionment figures, or, where no figure exists, the demonstrated need of the industry concerned.
- iii) Applications for the extraction of up to 1 million tonnes of sand and gravel will be permitted in Preferred Areas (identified on the proposals maps); taking into account the above criteria.
- iv) Applications that accord with the above criteria will be permitted provided that all the following criteria are met:
 - a. An appropriate buffer is included, within which no mineral working or sensitive development will be allowed; and
 - b. Suitable access and transport routes are identified; and
 - c. Final reinstatement of public rights of way should be close to their original alignment with intermediate reinstatements where possible; and
 - d. Noise is kept to an acceptable level; and
 - e. Measures to reduce the impact of dust, smoke and fumes are implemented; and
 - f. Suitable blasting controls are implemented; and
 - g. Impacts on groundwater and water supplies are found to be acceptable; and
 - h. An appropriate restoration scheme and after use is identified for the site.

There is no current Supplementary Planning Guidance note in place for mineral extraction within Denbighshire. A quarry buffer corridor is identified around Maes y Droell, covering most of the village.

4.1.1 Planning History and Context

Historic mapping shows that the northern parcel formed part of Llarnarmon Lead Mine from the 1830s. The southern parcel was already in use as a quarry on the First Edition Ordnance Survey mapping and included several built structures by around 1900. It was established in 1880 as a silica sandstone extraction and processing, as well as an industrial sand extraction site. Recent proposals to extend or modify quarry operations have been considered, including an application for an extension to the quarry, which was refused in 2008 (ref.15/2006/1371) and the importation of inert waste materials for recycling and use in restoration of quarry workings, which was also refused in 2013 (ref.15/2011/0692).

Existing (baseline) Environment

4.1.2 Statutory Designated Sites

The Natural Resources Wales (NRW) Interactive Map Viewer was used to identify statutory designated sites, located within 5 km of the Site. There are eight statutory designated sites located within 5 km of the Site, these are shown on Plate 1, below.



Plate 1 – Locations of statutory designated sites

There is one designated site of **international importance** located within 5 km of the Site boundary. This is the Berwyn and South Clwyd Mountains (Berwyn a Mynyddoedd De Clwyd) Special Area of Conservation (SAC), located approximately 1.1 km south of the site boundary at its closest point. The SAC is designated for the following qualifying features:

Annex I habitats that are a primary reason for selection of this site:

- 4030 European dry heaths
- 7130 Blanket bogs

Annex I habitats present as a qualifying feature, but not a primary reason for selection:

- 6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)
- 7140 Transition mires and quaking bogs
- 8120 Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*)
- 8210 Calcareous rocky slopes with chasmophytic vegetation

There are six Sites of Special Scientific Interest (SSSIs) located within 5 km of the Site:

- Llandegla Moor SSSI, located approximately 1.1 km south of the site boundary at its closest point. The SSSI forms part of the Berwyn and South Clwyd Mountains SAC and predominantly comprises heathland along with areas of bog habitat. These habitats support a breeding bird assemblage which contains both locally and nationally scarce species including black grouse *Tetrao tetrix*, short-eared owl *Asio flammeus*, hen harrier *Circus cyaneus* and curlew *Numenius arquata*;
- Graig, Llanarmon-yn-Ial SSSI, located approximately 1.2 km west of the site boundary at its closest point. The SSSI supports a mosaic of limestone and acidic grassland which support notable floral communities;
- Glaswelltiroedd Eryrys (Eryrys Grasslands) SSSI, located approximately 1.2 km northwest of the site boundary at its closest point. The site contains a mix of calcareous, acid, neutral and calaminarian grasslands along with basin mire. The floral assemblage supported includes species such as mountain everlasting *Antennaria dioica*, frog orchid *Coeloglossum viride* and field gentian *Gentianella campestris*. The site also supports notable assemblages of lichens and bryophytes;
- Bryn Alyn SSSI, located approximately 1.4 km northwest of the site boundary at its closest point. The SSSI comprises a mix of calcareous, neutral and acid grassland habitats along with limestone pavement and scree which support a diverse assemblage of plant species;
- Ruabon / Llantysilio Mountains and Minera SSSI, located approximately 4.6 km south of the site boundary at its closest point. The SSSI is comprised of a mix of limestone and acid grassland and heathland. Along with a diverse plant assemblage, the site also supports breeding populations of bird species such as merlin *Falco columbarius*, ring ouzel *Turdus torquatus* and golden plover *Pluvialis apricaria*. Mines within the SSSI are used as hibernation roosts by bats including lesser horseshoe *Rhinolophus hipposideros*; and
- Chwarel Cambrian / Cambrian Quarry, Gwernymynydd SSSI, located approximately 4.7 km north of the site boundary at its closest point. The SSSI is primarily designated for supporting a large hibernation colony of lesser horseshoe bats, along with several other bat species. As well as the bats, the site also supports a population of great crested newts (GCN) *Triturus cristatus* and dingy skipper *Erynnis tages* among other species.

The SSSIs are considered to be of **national importance** for nature conservation.

Moel Findeg Local Nature Reserve (LNR) is located approximately 3.7 km north of the Site. The LNR is an unusual example of lowland heathland occurring at a relatively high altitude. The LNR is considered to be of **regional importance** for nature conservation.

4.1.3 Non Statutory Designated Sites

Cofnod identified twenty-four Local Wildlife Sites (LWSs) located within 2km of the site boundary. These are:

- Caeau y Fron LWS, which comprises two fields of neutral grassland wholly or partly within the site boundary;
- North end of Maes Y Droell quarry and upland LWS, located wholly or partly within the site boundary. The LWS supports a diverse range of habitats, including multiple grassland types, woodland, scrub, heath, mire and flushes;

- Maes y Droell LWS, listed by Cofnod as approximately 15 m outside of the site boundary. No description has been provided for this site;
- Tan y Cefn LWS, located approximately 0.2 km south of the Site. The LWS comprises a field of neutral grassland and heath;
- Graianrhyd Wetland LWS, located approximately 0.5 km south of the Site. A series of fields supporting calcareous grassland, neutral grassland and mire;
- Graianrhyd Farm LWS, located approximately 0.6 km south of the Site, comprises an area of heathland;
- Waen-dyllog LWS, located approximately 0.6 km west of the Site. The LWS covers a small area of upland calcareous grassland and heath;
- Gors and Gors Wetland LWS, located approximately 0.7 km northwest of the site, comprises a series of fields containing a stream and areas of neutral and calcareous grassland, heath and rocky outcrops;
- Scotland Farm LWS, located approximately 0.8 km northeast of the site, is a mix of bog, acid grassland, heath and woodland habitats;
- Aber Tairnant LWS, located approximately 1 km southeast of the Site, comprises an area of neutral grassland;
- Pant-y-gwlanod LWS, located approximately 1.1 km northwest of the Site. The LWS comprises an area of species-rich neutral grassland;
- The Maen LWS, located approximately 1.1 km southwest of the Site. The LWS is a field containing neutral grassland, calcareous grassland and open water;
- Tyddyn Wen LWS, located approximately 1.1 km south of the Site, comprises an area of calcareous grassland associated with a small hillock;
- Gyl n Terrig (Afon Terrig) LWS, located approximately 1.3 km east of the Site. The site comprises a riparian area of semi-natural broadleaved woodland;
- Eryrys Wetland LWS, located approximately 1.4 km northwest of the Site. The LWS is formed of a mix of grassland, woodland and mire;
- Nercwys Mountain and Coed Gwern-rhiw LWS, located approximately 1.4 km north of the Site. The LWS comprises a large conifer plantation surrounded by a mosaic of heathland and grassland. It supports breeding nightjar *Caprimulgus europaeus* and woodcock *Scolopax rusticola* along with three species of reptile;
- Windy Ridge LWS, located approximately 1.4 km southeast of the Site. The LWS comprises an area of broadleaved riparian grassland and adjacent hay meadow;
- East of Graig LWS, located approximately 1.6 km west of the Site, comprises an extensive area of neutral grassland, calcareous grassland and limestone pavement;
- Rhewl LWS, located approximately 1.6 km southwest of the Site, is an upland area of neutral grassland and rush pasture;
- Old Stag lime quarry LWS, located approximately 1.6 km west of the Site, comprises an area of broadleaved woodland and calcareous grassland;
- Tyddyn (Afon Terrig) LWS, located approximately 1.6 km northeast of the Site. The LWS comprises an area of riparian broadleaved woodland along with several fields of semi-improved neutral grassland;
- Nant/Eryrys LWS, located approximately 1.7 km northwest of the Site, comprises an area of calcareous grassland with gorse scrub; and

- Top y Nant LWS, located approximately 2 km northwest of the Site, is an area of calcareous grassland.

The LWSs are considered to be of **county importance** for nature conservation.

4.1.4 Trees and Woodland

The Natural Resources Wales (NRW) Interactive Map Viewer identified no areas of ancient woodland on, or adjacent to, the site.

The Woodland Trust's database of notable, veteran and ancient trees identified no such trees within, or adjacent to, the site.

4.1.5 Habitats

The habitats within the Site are shown on Figure JN00777/DW10 / DW11 (northern and southern land parcels respectively) and are listed below:

- f1a – Blanket bog;
- f2e – Reedbeds;
- f2f – Other wetlands; and
- g1c – Bracken;
- g3c – Other neutral grassland;
- g4 – Modified grassland;
- h1a5 – Dry heaths – lowland;
- h1a7 – Wet heathland with cross-leaved heath – lowland;
- h3e – Gorse scrub;
- h3h – Mixed scrub;
- h3j – Willow scrub;
- r1 – Standing open water and canals;
- s1d – Other inland rock or scree;
- u1b5 – Buildings;
- w1b6 – Other upland mixed ashwoods;
- w1d – Wet woodland;
- w1g – Line of trees;
- w1g – Other broadleaved woodland;

The Site is divided into a northern former mine parcel (JN00777/DW10 polygons 1-23 & 68) and a larger southern former quarry parcel (JN00777/DW11 polygons 24-67), separated by a public bridleway.

East-west footpaths and a track or road running south-east towards Pen y Foel formerly crossed the Site. Mining, quarrying, track construction, stockpiling, former buildings and subsequent natural colonisation have altered the ground surface and vegetation across much of the Site. Most of the present-day habitat mosaic has therefore developed on disturbed ground following the cessation of these uses, rather than surviving as an intact semi-natural landscape.

The Site includes a number of locally varied habitats. The main ecological constraints are the mire, small areas of heath, ponds and other wetland features, together with the more mature woodland and tree belts along old walls, banks and former track lines. The extensive scrub, young woodland, sparsely vegetated quarry ground and other early successional vegetation have developed on former industrial land. They add cover and variation to the Site, but are generally common habitat types, are not particularly good examples of their UKHab categories and could be recreated through restoration.

Modified and other neutral grassland

Modified grassland (g4; polygons 24 and 64) lies on previously managed ground in the southern parcel. The swards are dominated by perennial rye-grass *Lolium perenne*, cocksfoot *Dactylis glomerata*, red fescue *Festuca rubra*, sweet vernal-grass *Anthoxanthum odoratum* and Yorkshire fog *Holcus lanatus*. Creeping buttercup *Ranunculus repens*, red clover *Trifolium pratense* and yarrow *Achillea millefolium* are also present. Polygon 64 is slightly more varied, with yellow-rattle *Rhinanthus minor*, ribwort plantain

Plantago lanceolata and field speedwell *Veronica persica*, but the sward remains dominated by ryegrass and cocksfoot. The grassland is species-poor to moderately diverse and does not meet the criteria for species-rich lowland meadow. It is of **neighbourhood importance** for nature conservation.

Other neutral grassland (g3c; polygon 16) is an unmanaged, rank sward. Localised patches support common spotted-orchid *Dactylorhiza fuchsii*, bird's-foot trefoil *Lotus corniculatus*, common sorrel *Rumex acetosa*, germander speedwell *Veronica chamaedrys*, meadow buttercup *Ranunculus acris*, common knapweed *Centaurea nigra* and creeping thistle *Cirsium arvense*. Tall ruderal vegetation and scrub are spreading into the sward. Although the grassland has some botanical interest, it is not a particularly good example of semi-natural neutral grassland and is of **neighbourhood importance** for nature conservation.

Heathland and mire

Small, discontinuous areas of dry heath (h1a5; polygons 4 and 12), wet heath (h1a7; polygon 7) and mire mapped as blanket bog (f1a; polygon 23) lie within the northern parcel. The dry heath contains common heather *Calluna vulgaris*, bell heather *Erica cinerea*, tormentil *Potentilla erecta*, heath bedstraw *Galium saxatile* and wavy hair-grass *Deschampsia flexuosa* on locally exposed sandy and stony substrate. It is of **neighbourhood importance** for nature conservation. The wet heath contains cross-leaved heath *Erica tetralix*, locally occasional bilberry *Vaccinium myrtillus*, purple moor-grass *Molinia caerulea*, hare's-tail cottongrass *Eriophorum vaginatum*, deergrass *Trichophorum cespitosum*, bog asphodel *Narthecium ossifragum*, soft rush *Juncus effusus* and *Sphagnum* species and is also of **neighbourhood importance**.

The heathland is not continuous across the northern parcel. Much of the surrounding land supports scrub, young woodland and other early successional vegetation, and encroachment is reducing the extent of the heath. The dry and wet heath areas are small and fragmented and are unlikely to persist at their current extent without management. They should therefore be treated as residual heathland within a disturbed former mine landscape, rather than as a continuous heathland unit. Polygon 23 is wetter and more coherent than the surrounding heath remnants and extends into adjoining land. This mire is of local importance and should be retained with an appropriate buffer, but it does not indicate comparable habitat quality across the wider northern parcel.

Bracken and scrub

Bracken *Pteridium aquilinum* (g1c; polygons 1, 3, 5, 6 and 20) covers several areas of the northern parcel, often with bramble *Rubus fruticosus* agg., rosebay willowherb *Chamerion angustifolium*, raspberry *Rubus idaeus*, gorse *Ulex europaeus* and scattered regenerating trees. Mixed scrub (h3h), gorse scrub (h3e) and grey willow *Salix cinerea* scrub (h3j) are widespread across both parcels. Downy birch *Betula pubescens*, hawthorn *Crataegus monogyna*, rowan *Sorbus aucuparia*, blackthorn *Prunus spinosa* and young sycamore *Acer pseudoplatanus* are present in varying proportions. Dense gorse and willow scrub covers parts of the former tracks, stockpiles and steep quarry ground.

Most of the scrub has developed as part of the natural colonisation of former industrial land. It provides cover and nesting, refuge and foraging opportunities, however it is considered to be common habitat, with limited botanical interest and can readily re-establish during restoration. As such it is considered to be of **neighbourhood importance**.

Woodland, tree belts and historic boundary features

Woodland is fragmented and varies considerably in age and structure. Much of it comprises young naturally regenerated broadleaved woodland (w1g; including polygons 14, 22, 27, 35, 39, 49 and 54) and scrub that is developing into woodland. Birch and willow dominate these areas, with varying amounts of rowan, gorse, bracken and tall grasses. This woodland has developed from scrub on former quarry land and is not long-established semi-natural woodland.

The older woodland and tree belts lie along defunct walls, banks, former tracks and parcel edges, including polygons 18, 25, 31, 59, 62, 67 and 68. As well as sycamore, they include ash *Fraxinus excelsior*, goat willow *Salix caprea*, hazel *Corylus avellana*, holly *Ilex aquifolium*, elder *Sambucus nigra* and dog rose *Rosa canina*. The ground flora is mostly made up of widespread plants of shade,

disturbance and base-enriched ground, including ivy *Hedera helix*, ground elder *Aegopodium podagraria*, nettle *Urtica dioica*, hart's-tongue fern *Asplenium scolopendrium* and occasional wood sorrel *Oxalis acetosella*.

The woodland beside old walls, banks and tracks is locally more botanically varied than the wider secondary woodland. However, the woodland floor does not support a continuous ancient woodland flora and no ancient woodland indicator species were recorded during the survey. There is also no indication from the available mapping that the woodland is ancient. The Site does not contain ancient woodland. Polygons 59 and 62 are mapped as other upland mixed ashwoods because of their canopy composition, but they are narrow strips along old boundaries and are not extensive or particularly good examples of that habitat type.

Wet woodland (w1d; polygon 11) forms a narrow strip between the northern waterbodies. Grey willow and downy birch dominate, with rowan, scrub species and a small compartment of Sitka spruce *Picea sitchensis*. It has developed beside man-made waterbodies and is spreading into the adjoining heathland. The older trees and woodland along walls, banks and former tracks are of **local importance** because they provide continuity through the Site. The younger secondary woodland is generally of **neighbourhood importance**. Older woodland and mature trees should be retained where practicable, but the widespread young woodland is not an irreplaceable habitat.

Standing water, reedbed and other wetland

Both parcels contain man-made ponds and former settling or irrigation lagoons. Some comprise open water with little marginal vegetation, while others have developed reedbed, swamp or wet woodland around their edges. Reedbed (f2e; polygon 26) is dominated by common reed *Phragmites australis*, greater reedmace *Typha latifolia* and horsetail *Equisetum* species, with scrub spreading around the margins. Other wetland (f2f; polygon 51) contains reedmace, bottle sedge *Carex rostrata*, common spike-rush *Eleocharis palustris* and marsh willowherb *Epilobium palustre*.

New Zealand pygmyweed *Crassula helmsii* is locally abundant in polygon 51. This invasive non-native species reduces the condition of the wetland and will need to be addressed through biosecurity measures and a site-specific management approach. The ponds and wetland features add locally valuable habitat variation and may be relevant to the protected species assessment. Taken together, they are of **local importance**. The individual waterbodies are artificial, vary in condition and are not particularly good examples of natural standing water, reedbed or swamp.

r1 – Standing open water and canals

Ponds P1–P5 and P11 form a cluster of man-made pools in the northern former lead mine parcel, while P6–P9 are located within the southern quarry workings. The ponds vary in size, depth and condition. Aquatic vegetation is generally sparse, although some ponds support submerged or floating *Potamogeton* spp. and marginal swamp vegetation including reedmace., common reed, *Epilobium* spp. and *Juncus* spp. A cluster of ponds within an otherwise unmanaged area will be a valuable resource for wildlife and the habitat is therefore classed as of **local importance**.

Quarry faces, spoil, rock and early successional vegetation

The former quarry contains extensive areas of sparsely vegetated rock, scree and quarry spoil (s1d; including polygons 29, 32, 37, 38, 41, 46, 61 and 66). Ground conditions vary from loose calcareous spoil and exposed rock to wetter hollows and occasional more acidic substrate. The vegetation includes scattered mouse-ear hawkweed *Pilosella officinarum*, common centaury *Centaureum erythraea*, common cat's-ear *Hypochaeris radicata*, sheep's fescue *Festuca ovina*, common bent *Agrostis capillaris*, common sedge *Carex nigra*, oxeye daisy *Leucanthemum vulgare*, perforate St John's-wort *Hypericum perforatum*, eyebright *Euphrasia* species and local ruderal vegetation. Scrub is spreading across parts of the quarry floor and former stockpiles.

The quarry floor and spoil tips form an early successional post-industrial mosaic and are among the more varied parts of the southern parcel. However, vegetation cover is patchy and changes with substrate, drainage and ongoing scrub colonisation. The habitat is not a single, extensive or particularly good example of a semi-natural open mosaic, rock or scree habitat. The quarry mosaic is of **local**