

MAES Y DROELL QUARRY EXTRACTION OF INDUSTRIAL SAND

Environmental Statement
Volume II
Chapters 1 to 5

Silica Sand Mold Limited
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Document history

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Term	Definition
Above Ordnance Datum (AOD)	Above Ordnance Datum: ground levels are measured relative to the mean sea level at Newlyn in Cornwall, referred to as "Ordnance Datum". Heights are reported in metres above AOD hence m AOD.
Aquifer	A geological formation that can store and transmit groundwater in significant quantities.
Aftercare	The management and maintenance of restored land after quarrying has finished, to ensure that habitats and planting become successfully established.
Applicant	Silica Sand Mold Limited, the company applying for planning permission.
AQMA	Air Quality Management Area. An area identified by a local authority where air quality objectives are not being achieved.
Background Sound Level LA90,T	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.
Baseline conditions	The existing environmental conditions against which the effects of the Proposed Development are assessed.
BGS	British Geological Survey.
BNL	Basic Noise Level. A calculated road traffic noise level used in the assessment of traffic noise.
BPM	Best Practicable Means. Reasonably practicable measures used to prevent or minimise effects such as noise.
Bund	A raised earth mound used to screen views, reduce noise or safely contain materials.
CEMP	Construction Environmental Management Plan. A document setting out how environmental effects will be controlled during site preparation and other works.
CIEEM	Chartered Institute of Ecology and Environmental Management.
CIfA	Chartered Institute for Archaeologists.
Combined effects	Effects that arise where different environmental impacts from the Proposed Development affect the same receptor. These are also called intra-project effects.
Competent expert	A suitably qualified and experienced professional responsible for preparing or contributing to an environmental assessment.
Conceptual hydrogeological model	A simplified understanding of the geology, groundwater flow, recharge and interaction between groundwater and surface water.
CRTN	Calculation of Road Traffic Noise. A method used to calculate noise from road traffic.
Cumulative effects	Effects arising when the Proposed Development is considered together with other existing, approved or reasonably foreseeable developments. These are also called inter-project effects.
DCC	Denbighshire County Council.
Designated heritage asset	A heritage asset formally protected through designation, such as a Listed Building or Scheduled Monument.
EPSM licence	European Protected Species Mitigation licence. A licence allowing works affecting a European Protected Species to proceed subject to agreed mitigation, management and monitoring.

Term	Definition
ES	Environmental Statement. Documents reporting the methodology and findings of the EIA, including baseline conditions, likely effects, mitigation, and residual effects.
EZol	Ecological Zone of Influence. The area within which ecological features could be affected by the Proposed Development.
FCA	Flood Consequences Assessment. An assessment of flood risk and the measures proposed to manage water safely.
FTE	Full time equivalent. A measure used to express employment on the basis of full time jobs.
GCN	Great crested newt. A legally protected amphibian species recorded within the Site.
GIS	Geographical Information System. Digital mapping software used to record, analyse and display spatial information.
GLVIA3	Guidelines for Landscape and Visual Impact Assessment, Third Edition. Guidance used to assess landscape and visual effects.
Groundwater table	Water held below ground within soil, rock and geological formations. The level below which the ground is saturated with groundwater.
Habitat	The natural environment in which a plant, animal or ecological community lives.
HER	Historic Environment Record. A record of known archaeological sites, historic buildings and other heritage assets.
Heritage asset	A building, monument, site, place or landscape with archaeological, architectural or historic interest.
HGV	Heavy Goods Vehicle. A large commercial vehicle used to transport mineral products, plant or materials.
HIA	Hydrogeological Impact Assessment. An assessment of potential effects on groundwater, surface water and water dependent receptors.
Hydrogeology	The study of groundwater and how it moves through soil and rock.
Hydrology	The study of surface water, rainfall, runoff, streams, ponds and drainage.
IAQM	Institute of Air Quality Management.
Impact	A change arising from the Proposed Development. The consequence of that change for a receptor is described as an effect.
Indirect effect	An effect arising through a secondary pathway rather than as an immediate consequence of the Proposed Development.
Industrial sand	High quality sand with particular physical and chemical properties suitable for specialist industrial uses. It may also be referred to as silica sand.
Infiltration	The movement of surface water into the ground.
Inter-project effects	Effects arising where the Proposed Development combines with other existing, approved or reasonably foreseeable developments.
Intra-project effects	Effects arising where different environmental impacts from the Proposed Development affect the same receptor or receptor group.
LCA	Landscape Character Area. An area with a distinct and recognisable landscape character.
Likely significant effect	An environmental effect considered important enough to require detailed assessment and reporting through the EIA.
Listed Building	A building or structure formally designated for its special architectural or historic interest.

Term	Definition
LLFA	Lead Local Flood Authority.
LNR	Local Nature Reserve. A site designated for its local importance for wildlife, geology, education or public enjoyment.
LWS	Local Wildlife Site. A non-statutory site identified as being important for nature conservation at the local level.
LVIA	Landscape and Visual Impact Assessment. An assessment of effects on landscape character and views experienced by people.
Magnitude of impact	The scale or degree of environmental change, taking account of factors such as its extent, intensity, duration and reversibility.
Mineral reserve	Mineral that has been identified as capable of being technically and economically extracted.
Mitigation	Measures used to avoid, prevent, reduce, remedy or offset an adverse environmental effect.
Monitoring	The measurement or review of environmental conditions to check predictions, demonstrate compliance and identify whether corrective action is required.
National Landscape	A nationally protected landscape recognised for its natural beauty and special qualities. This designation was formerly known as an Area of Outstanding Natural Beauty.
NBB	Net Benefit for Biodiversity. An overall improvement in biodiversity and ecosystem resilience resulting from development.
Negligible effect	An imperceptible or very minor effect on an environmental resource or receptor.
Neutral effect	An effect that is neither beneficial nor adverse.
Nitrogen dioxide (NO ₂)	An air pollutant principally associated with combustion sources, including road traffic.
Non-designated heritage asset	A heritage asset with archaeological, architectural or historic interest that is not formally designated.
Non-statutory designated site	A locally recognised nature conservation site that does not have statutory protection, such as a Local Wildlife Site.
NRW	Natural Resources Wales.
NSR	Noise sensitive receptor. A property, person or use that may be particularly susceptible to noise, such as a dwelling.
NTS	Non-Technical Summary. A plain-language summary of the Environmental Statement intended for non-specialist readers.
Operational phase	The period during which the quarry is actively worked, including mineral extraction, processing, transportation and progressive restoration.
Particulate matter	Small airborne particles that may affect air quality and human health.
Pathway	The route by which an environmental impact could reach a receptor, such as dust travelling from the quarry to a dwelling.
PM ₁₀	Airborne particles with a diameter of 10 micrometres or less.
PM _{2.5}	Fine airborne particles with a diameter of 2.5 micrometres or less.

Term	Definition
Pollution prevention measures	Controls used to prevent fuels, oils, chemicals or other pollutants from entering land, groundwater or surface water.
PRoW	Public Right of Way. A route over which the public has a legally protected right of passage, including footpaths and bridleways.
Progressive restoration	The restoration of worked areas in phases alongside continuing mineral extraction, rather than waiting until quarrying has ended.
Proposed Development	The proposed winning and working of industrial sand and associated minerals with restoration to nature conservation at Maes y Droell Quarry
Qualitative assessment	An assessment based on descriptive evaluation, available evidence and professional judgement rather than numerical calculations.
Quantitative assessment	An assessment based on measurements, calculations or numerical criteria.
Reasonable alternatives	Realistic options considered by the Applicant in relation to matters such as location, design, working methods, phasing or restoration.
Receptor	A person, property, habitat, species, landscape feature, heritage asset or environmental resource that could be affected by the Proposed Development.
Residual effect	The environmental effect remaining after mitigation has been taken into account.
Restoration	The process of returning land affected by mineral extraction to an appropriate and beneficial condition or after-use.
RCS	Respirable crystalline silica. Very fine silica particles capable of reaching the deepest parts of the lungs when inhaled.
SAC	Special Area of Conservation. A site protected for habitats or species of international importance.
Scheduled Monument	A nationally important archaeological site or monument protected by law.
Sensitivity	The susceptibility, value or importance of a receptor and its ability to accommodate environmental change.
Significance of effect	A conclusion about the importance of an environmental effect, generally informed by the magnitude of impact and the sensitivity or value of the receptor.
Site	The land within the planning application boundary at Maes y Droell Quarry.
Source-Pathway-Receptor	A risk assessment approach considering the source of an impact, the route by which it could travel and the receptor that could be affected.
SPA	Special Protection Area. A site protected because of its importance for rare, vulnerable or migratory birds.
Spatial scope	The geographical area covered by an environmental assessment.
SPR	Source-Pathway-Receptor.
SSSI	Site of Special Scientific Interest. A site legally protected for its nationally important biological or geological features.
Statutory designated site	A site protected under legislation because of its ecological, geological or other environmental importance.

Term	Definition
SuDS	Sustainable Drainage Systems. Measures used to manage surface water runoff in a controlled and environmentally appropriate way.
Surface water	Water present at ground level, including streams, ditches, ponds and rainfall runoff.
Swept-path analysis	A drawing or computer assessment showing the space required for a vehicle to manoeuvre safely.
Temporal scope	The stages or periods considered in an assessment, such as site preparation, operation, restoration and aftercare.
Traffic severance	The extent to which traffic makes it more difficult for people to cross a road or move between places.
Translocation	The controlled movement of plants or animals from one location to another, normally under an agreed method or licence.
Transport Assessment	An assessment of access, traffic generation, vehicle routing, highway capacity and road safety.
UKHab	UK Habitat Classification. A standard system used to classify and map habitats.
VER	Valued Ecological Receptor. A habitat, species or designated site of sufficient importance to require detailed consideration in the EclA.
Visual receptor	A person or group of people who may experience a change in views as a result of the Proposed Development.
Watching brief	Archaeological monitoring undertaken while excavation or other ground-disturbing works are in progress.
Wheel wash	Equipment used to clean vehicle wheels before vehicles leave the Site, helping to prevent mud and dust from being deposited on public roads.
WSI	Written Scheme of Investigation. A document setting out how archaeological investigation, recording and reporting will be undertaken.
ZTV	Zone of Theoretical Visibility. A computer-generated study showing where a development may theoretically be visible, taking account of features such as topography, buildings and vegetation.

1 INTRODUCTION

1.1 Background Context and Introduction to the Proposed Development

- 1.1.1 Silica Sand Mold Limited (hereafter 'the Applicant') is seeking full planning permission for the proposed winning and working of industrial sand and associated minerals with restoration to nature conservation at Maes y Droell Quarry (hereafter referred to as the 'Site'), Graianrhyd, Mold, Denbigshire.
- 1.1.2 The Site falls within the administrative area of Denbigshire County Council (DCC).
- 1.1.3 The Proposed Development comprises the:
- Recommencement of mineral extraction involving the winning and working of high-grade industrial sand from a previously operational quarry that has lay dormant for several years, incorporating a previously consented northern extension, utilising modern plant, equipment, and working practices.*
- 1.1.4 The progressive restoration of the quarry, from the outset of the recommencement of work. Restoration will involve the creation and management of a range of habitats to support an abundance of species. This will occur as phases of the quarry are completed and is therefore progressive. On final restoration, the former quarry would be an established site of high nature conservation importance subject to appropriate aftercare management secured by planning conditions.
- 1.1.5 This Environmental Statement (ES) presents an assessment of the likely significant environmental effects of the Proposed Development and the measures envisaged to avoid, prevent and reduce such effects. The ES has been prepared in accordance with the requirements of the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (as amended) (hereafter referred to as the 'EIA Regulations 2017') and forms part of a suite of documents prepared to accompany the planning application to DCC.
- 1.1.6 The location of the Proposed Development is identified in **ES Volume IV, Figure 1: Site Location Plan** and **ES Volume IV, Figure 2: Aerial Context Plan** and is described further in **ES Volume II, Chapter 4: Proposed Development**.

1.2 The Applicant

- 1.2.1 Silica Sand Mold Limited is a UK-registered family-run private limited company specialising in the extraction, processing and treatment of minerals including industrial sand. The wider portfolio of operations includes agricultural business operations.
- 1.2.2 Silica Sand Mold Limited has over 20 years' experience managing minerals and waste sites including transportation across the North West and North of England into North Wales.
- 1.2.3 The business has a strong track record of:
- Fulfilling planning and environmental requirements;

- Working positively with local authorities and regulators; and
- Engaging with local communities and quarry liaison committees.

1.3 The Site

- 1.3.1 The application boundary is presented in **ES Volume IV, Figure 1: Site Location Plan** and **ES Volume IV, Figure 2: Aerial Context Plan**. The area which it encompasses is hereafter referred to as ‘the Site’, which encompasses the whole of the existing quarry site.
- 1.3.2 The Site is located approximately 6.5 km south of Mold and 12 km Northwest of Wrexham at Grid Ref SJ 218565 with postcode CH7 4QW.
- 1.3.3 The Site is bounded by Graianrhyd Road to the south and open fields to the north, east and west.
- 1.3.4 The access to the Site is at Grid Ref SJ216565 on the minor road from Graianrhyd to Eryrys. This point is 375 m to the north of the junction of the minor road with the B5430 Ruthin to Minera road.
- 1.3.5 There are existing residential properties located along Graianrhyd Road, with additional isolated properties along roads to the east and west.
- 1.3.6 Graig Limestone Quarry is between 800 – 1,000 metres to the west. Where appropriate, this operation has been considered as a development that could have cumulative impacts and has been assessed as part of the associated ES.
- 1.3.7 The Site extends to approximately 22 hectares and is already partially worked. It comprises land located to the north and south of Bridleway No. 515/17, which runs east–west between Eryrys Road and Llynwern Road.
- 1.3.8 Maes y Droell has historically been an established quarry producing high-grade industrial sand and fine clay with extraction activities having taken place on the Site for over 100 years.

North Area

- 1.3.9 The application Site’s northern section spans approximately 8.04 hectares and is roughly square-shaped, featuring a natural landscape with vegetation, shrubs, trees, and several ponds crossed by a few tracks or footpaths. Adjacent to the application Site is a cemetery (Mynwent Maes y Droell Cemetery) and several mature trees.

South Area

- 1.3.10 The southern area extends to approximately 13.96 hectares and is occupied by the former Maes y Droell Quarry and comprises a mix of worked and exhausted land and features deep, flooded quarry pits in its south, vegetated spoil heaps in its east, as well as an area of meadow, hardstanding and redundant buildings in its west and settling ponds and limited woodland in its north.

1.4 Planning History

- 1.4.1 Quarrying has taken place at Maes y Droell for well in excess of 100 years. Maes y Droell Quarry was established in 1880 by J Stoddard and Sons Ltd. The main operations at the Site have included quarrying and processing of industrial sandstone; and the manufacture of high-quality industrial sands for specialist markets.
- 1.4.2 The principal historic consents comprise an Interim Development Order (IDO) permission for industrial sand quarry workings (ref. P11/107, dated 1947), a mineral permission for the winning and working of minerals with associated accesses (ref. 11/290, dated 1950), and a further permission for mining operations (ref. 11/355, dated 1951). New conditions were issued in respect of the IDO permission in 1996 (ref. 15/384/96).
- 1.4.3 A review of the mineral permissions (ROMP) application (ref. 15/877/98) was submitted in respect of the 1950 consent; however, this did not result in the approval of a comprehensive modern working, restoration or aftercare scheme.
- 1.4.4 More recently, 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).
- 1.4.5 The Site's planning history is complex, with several historic permissions relating to mineral extraction.
- 1.4.6 Pre-application advice was received in March 2024 and included commentary on the complex planning position. The response acknowledged that the Site's fragmented development and historic consents have left it without a comprehensive and acceptable approved restoration scheme. The pre-application response accompanies the planning application.
- 1.4.7 In response to this situation, in order to move forward with clarity and without undue complexity in respect of the planning application process, the proposal seeks a consent that would in effect consolidate the Site's planning permissions into a single modern consent with a single set of planning conditions. This would provide a clear and consistent approach to mineral extraction and a detailed, holistic restoration scheme across the Site.

2 ENVIRONMENTAL IMPACT ASSESSMENT CONTEXT

2.1 Environmental Impact Assessment Context

- 2.1.1 The term 'Environmental Impact Assessment' (EIA) describes a procedure that must be followed for certain types of developments or projects before they can be given 'consent', in this case planning permission.
- 2.1.2 The procedure is a means of systematically drawing together an assessment of a development's likely significant environmental effects. This helps to ensure that the importance of the predicted effects, and the scope for reducing them, are properly understood by the public and the relevant competent authority before it makes its decision.
- 2.1.3 According to Welsh Parliament Senedd Research, The Planning Series 10 – Environmental Impact Assessment (August 2022):

'An Environmental Impact Assessment (EIA) is a procedure that ensures environmental implications are taken into account before planning decisions are made. An EIA assesses the possible positive and negative impact a proposed project may have on the environment. This information is submitted to the local planning authority or the Welsh Government in the form of an Environmental Statement (ES) to be considered alongside a planning application. An ES must contain a non-technical summary.'

- 2.1.4 In accordance with Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (as amended) (hereafter referred to as the 'EIA Regulations 2017'), an application submitted for an EIA Development, must be accompanied by an ES, which is the written output of the EIA process.
- 2.1.5 The Proposed Development is 'EIA Development' pursuant to Regulation 2 of the EIA Regulations 2017. This ES is one of the supporting documents submitted to the determining planning authority.
- 2.1.6 Stephenson Halliday has been commissioned by the Applicant to carry out the EIA in support of the planning application and act as lead author of this ES. Alongside Stephenson Halliday, the ES has incorporated technical input from several experts, as outlined in **Table 2-3** and **ES Volume III, Appendix 1.1: Statement of Competence**.
- 2.1.7 The following sections outline the legal framework and structure of the ES and supporting documents. A breakdown of the information required by the EIA Regulations 2017 is provided in **Table 2-2** alongside the location of where this information is provided within this ES.

2.2 Legal Framework for the Environmental Statement

- 2.2.1 The EIA Regulations 2017 set out the types of development which must always be subject to an EIA (Schedule 1 Development) and other developments which may require an

assessment as to whether they give rise to likely significant environmental effects (Schedule 2 Development).

EIA Screening

2.2.2 The Proposed Development falls under Schedule 2, Category 2a 'Quarries, open cast mining and peat extraction' of the EIA Regulations 2017 whereby any development may require an EIA depending on the characteristics of the development, the location of the development and the types and characteristics of the potential impact. Schedule 3 of the EIA Regulations 2017 outlines the criteria that should be applied when determining whether a Schedule 2 development requires EIA. The Schedule 3 criteria are summarised as follows:

- The characteristics of the Proposed Development (e.g., its size, cumulation with other developments, use of natural resources, production of waste, pollution and nuisances and the risk of accidents, and risks to human health);
- The environmental sensitivities of the geographical area (e.g., its existing and approved land use, the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground and the absorption capacity of the natural environment); and
- The characteristics of the potential impact, specifically the likely significant effects of the development taking into account:
- The magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected);
- The nature of the impact;
- The transboundary nature of the impact;
- The intensity and complexity of the impact;
- The probability of the impact;
- The expected onset, duration, frequency and reversibility of the impact;
- The cumulation of the impact with the impact of other development(s); and
- The possibility of effectively reducing the impact.

EIA Scoping

2.2.3 A formal request for a Scoping Opinion was submitted to DCC in March 2025 under Regulation 14 of the 2017 Regulations. The request was accompanied by a Scoping Report which provided initial information about the Proposed Development and the proposed scope of the environmental impact assessment and content of the ES.

2.2.4 DCC consulted with internal and external consultees to allow their comments to be taken into account in refining the site design and EIA process. The EIA Scoping Report is presented in

ES Volume III, Appendix 1.2: EIA Scoping Report together with a formal request for an EIA Scoping Direction, in accordance with Regulation 33(1) of the EIA Regulations 2017.

2.2.5 A Scoping Response was received from DCC on the 27th of May 2025, and was accompanied by the individual Scoping Responses from a number of consultees. The Authority stated that:

The authority has also considered the specific characteristics of the proposal, the type of development and the environmental features likely to be affected by the development in accordance with regulation 14 (6) of the 2017 regulations. The application should be assessed and referred to within the Environmental Statement when the planning application is submitted

2.2.6 The Scoping Opinion can be viewed at **ES Volume III, Appendix 1.3: EIA Scoping Response**.

2.2.7 The main topics given detailed consideration in the ES (and taking into account the requirements of Regulations 4 and 18 and in Schedule 4 the 2017 Regulations) are set out in **Table 2-1**, which summarises the key points made in the Scoping Response, with reference to individual assessment topics where appropriate.

Table 2-1: Summary of Scoping Responses

Scoping Topic	Scoped in / Scoped out	Addressed within ES
<i>Climate Change</i>	Scoped out	Not Applicable
<i>Agricultural Land</i> The applicant proposed to scope soils out of the EIA process. This is supported but this matter needs consideration as part of the planning application.	Scoped out	Not Applicable
<i>Air Quality</i> The air quality assessment should assess emissions from quarry-related traffic, on-site activities, and dust-producing activities.	Scoped in	ES Volume II, Chapter 07: Air Quality
<i>Noise</i> Agreed that on-site construction noise is to be scoped in, and for the operational phase, it is proposed to scope traffic noise and on-site operational noise in. On-site restoration noise scoped in.	Scoped in	ES Volume II, Chapter 06: Noise
<i>Heritage and Archaeology</i> Built heritage has been excluded from the	Heritage and Archaeology to be scoped in	ES Volume II, Chapter 08: Cultural Heritage

assessment. However, heritage and archaeology have been scoped in due to the potential presence of archaeological remains within the Site.		
<i>Landscape & Visual Effects</i> Landscape and visual effects should be scoped in.	Scoped in	ES Volume II, Chapter 09: Landscape and Visual
<i>Transport</i> Transport is proposed to be scoped into the EIA Process and ES.	Scoped in	ES Volume II, Chapter 10: Transport
<i>Ecology / Biodiversity</i> Ecology / Biodiversity is proposed to be scoped into the EIA Process and ES. This is supported.	Scoped in	ES Volume II, Chapter 11: Ecology
<i>Hydrology / Hydrogeology</i> The Lead Local Flood Authority and Natural Resources Wales both advise that hydrology and hydrogeology should be scoped in. The LLFA confirms that a Flood Consequence Assessment, Surface Water Drainage Strategy, Water Framework Directive Assessment and SAB approval will be required. NRW note that existing quarry workings add complexity and advise that groundwater interactions should be assessed through the EIA, informed by existing data, proposed phasing, and groundwater levels. They also recommend inclusion of a water demand assessment, consideration of borehole supply, and assessment of potential groundwater drawdown to inform any future Groundwater Impact Consent.	Scoped in	ES Volume II, Chapter 12: Hydrology and Hydrogeology
<i>Ground Conditions and Contaminated land</i>	Scoped in	Ground Conditions and Contaminated Land were initially scoped into the EIA in accordance with the Scoping Opinion. A

The council considers that insufficient evidence to scope out this topic has been provided, and potential significant effects cannot be ruled out at this time		Phase 1 Geo-Environmental Desk Study has been completed, the findings of which indicate a low level of risk and no likely significant environmental effects. Accordingly, this topic has been scoped out of the ES. The findings of the Phase 1 Desk Study are summarised within the Planning Statement accompanying the application.
<i>Waste</i> It is noted that Waste is not proposed to be scoped into the EIA Process and ES. This is accepted as it is understood no importation of waste is proposed.	Scoped out	Not Applicable
<i>Major Accidents and Disasters</i>	Scoped Out	Not Applicable
<i>Socio-Economic</i> The positive and negative socio-economic effects of the development should be considered.	Scoped in	ES Volume II, Chapter 13: Community and Socio-Economic Considerations

2.3 Environmental Statement

2.3.1 The ES comprises four parts:

- Volume I: Non-Technical Summary;
- Volume II: Main Written Statement;
- Volume III: Supporting Technical Appendices; and,
- Volume IV: Figures.

2.3.2 Schedule 4 of the EIA Regulations 2017 stipulates the information required within an ES. **Table 2-2** summarises the requirements and where the information is located in this ES.

Table 2-2: Specified Information within Schedule 4 of the EIA Regulations

Para.	Required information	Location within this ES
1	Description of the development, including in particular:	
	(a) a description of the location of the development	ES Volume II, Chapter 03: The Site and Surroundings
	(b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-	ES Volume II, Chapter 04: Proposed Development

	use requirements during the construction and operational phases	
	(c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used	ES Volume II, Chapter 04: Proposed Development
	(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operational phases)	ES Volume II, Chapters 06 to 15
2.	A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects	ES Volume II, Chapter 05: Environmental Context and Reasonable Alternatives Considered
3.	A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge	ES Volume II, Chapters 06 to 15
4	A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape	ES Volume II, Chapters 06 to 15
5	A description of the likely significant effects of the development on the environment resulting from, inter alia:	

	a) the construction and existence of the development, including, where relevant, demolition works;	ES Volume II, Chapters 06 to 15
	b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;	ES Volume II, Chapters 11 and 12
	c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;	ES Volume II, Chapters 06 and 07
	(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);	ES Volume II, Chapter 08
	e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;	ES Volume II, Chapter 14
	(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;	Not Applicable
	(g) the technologies and the substances used	Not Applicable
6	A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved	ES Volume II, Chapters 06 to 15
7	A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases	ES Volume II, Chapters 06 to 15
8	A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which	Not Applicable

	are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies	
9	A non-technical summary of the information provided under paragraphs 1 to 8	ES Volume I, Non-Technical Summary
10	A reference list detailing the sources used for the descriptions and assessments included in the ES.	ES Volume III, Appendix 1.4 Reference List

2.4 The Project Team and Statement of Competency

- 2.4.1 In accordance with Regulation 17(4)(a) and (b) of the EIA Regulations 2017, the ES and technical assessments which inform it have been undertaken by a suitably qualified project team with sufficient expertise to ensure completeness and quality.
- 2.4.2 The organisations from which the technical expertise needed to prepare the ES has been drawn are listed in **Table 2-3**. Competent expert statements for individuals who have authored ES Chapter(s) or a technical appendix of this ES are provided in **ES Volume III, Appendix 1.1: Statement of Competence**. These statements present the project team's roles, relevant expertise and qualifications.
- 2.4.3 Each assessment was undertaken against criteria contained within relevant topic guidance and planning policy, considering any mitigation measures proposed. The final chapter of the ES provides an overview of the predicted residual effects of the Proposed Development and an assessment of their overall significance.

Table 2-3: The Project Team

Role	Company
EIA Coordinator and Management Project Management Non-Technical Summary	Stephenson Halliday
Noise Assessment	Noise Consultants Ltd, part of the Logika Group
Air Quality Assessment	Air Quality Consultants as part of the Logika Group

Cultural Heritage Assessment	Andrew Josephs Associates, Archaeological and Cultural Heritage Consultancy
Landscape and Visual Impact Assessment (LVIA)	Stephenson Halliday
Transport Assessment	SCP Transport Planning/Infrastructure Design
Ecological Impact Assessment (EcIA)	SK Environmental Ltd
Hydrological and Hydrogeological	Envireauwater

2.5 Baseline

- 2.5.1 The environmental baseline is the quarry in its condition at the point of assessment. The baseline is taken as 2025/2026 since this is the year in which the majority of the baseline studies for the EIA have been undertaken. If previous study data has been utilised to inform the baseline in any of the technical chapters, this is clearly stated, and justification provided as to why this is considered appropriate.
- 2.5.2 This baseline can be described as an industrial quarry complex that is entirely unrestored. The site has begun to be colonised by immature vegetation. The industrial quarry buildings and associated paraphernalia, including water management lagoons, remain in situ.

2.6 Study Areas – Spatial Scope of the Assessments

- 2.6.1 The technical chapters describe as necessary the spatial scope, including the rationale for determining the specific area within which the assessment is focused. The study areas are determined by the nature of the impacts and the locations of potentially affected resources or receptors. Some topics consider a wider area, owing to the nature of the impacts being assessed. The Landscape and Visual Impacts is one such example. Other assessments such as Noise and Heritage are more localised in scope.

2.7 Assessment Years – Temporal Scope of the Assessments

- 2.7.1 This ES assess all phases of the Proposed Development:
- Site Preparatory Works: including soil stripping and temporary screening mound construction as required for the mineral working across the entire Site;
 - Operational Phases: the mineral extraction area is divided into four phases that will be developed in an overlapping and continuous sequence; and
 - Progressive and Final Site Restoration: final restoration of the Site, which will take approximately 12-24 months after the completion of mineral extraction. A long-term aftercare programme will manage the restored habitats.

2.8 Embedded Mitigation and Further Mitigation

- 2.8.1 Each technical chapter sets out specific measures that have been incorporated into the scheme design to avoid or minimise impacts, and any industry standard impact avoidance measures that will be implemented. These include compliance with best practice guidance documents and existing controls that are in place on-site. The initial impact assessment for each topic has been undertaken on the basis of these measures being implemented (i.e. they are 'embedded mitigation'). The embedded mitigation measures are also set out in **ES Volume II, Chapter 4: Proposed Development**.
- 2.8.2 Once the likely effects have been identified and quantified, consideration has then been given to any further mitigation (over and above embedded mitigation) that may be required to mitigate any likely significant adverse effects identified. These measures are described in the further mitigation sections of each technical assessment.
- 2.8.3 The residual effects (after the implementation of mitigation) have then been assessed and presented at the close of each technical assessment.

2.9 Assessment Methodology and Significance Criteria

- 2.9.1 Impacts are defined as changes arising from the Proposed Development. Consideration of the result of these impacts on environmental receptors enables the identification of associated effects, and their classification (i.e. major, moderate, minor and negligible, and adverse, neutral or beneficial). Each effect has been classified both before and after further mitigation measures have been applied, if this is required. Effects after mitigation are referred to as 'residual effects'.
- 2.9.2 The classification of effects is undertaken with due regard to the following:
- extent (local, regional or national) and magnitude of the impact;
 - effect duration (whether short, medium or long-term);
 - effect nature (whether direct or indirect, reversible or irreversible);
 - whether the effects occur in isolation, are cumulative or interactive;
 - performance against environmental quality standards and in the context of relevant legislation, standards and accepted criteria;
 - number of receptors affected;
 - sensitivity of receptors;
 - compatibility with environmental policies; and
 - professional experience and judgment of the assessor.
- 2.9.3 Further details are provided in each technical assessment where appropriate.

- 2.9.4 Where it has not been possible to quantitatively assess effects, qualitative assessments have been carried out, based on available knowledge and professional judgment. Where any uncertainty exists, this has been noted as limitations to the assessment within the limitations or difficulties section of each technical assessment.
- 2.9.5 To enable comparison between technical topics and aid understanding of the EIA findings, standard terms are used wherever possible to classify effects throughout the ES (major, moderate, minor and negligible), and effects are also described as being adverse, neutral or beneficial. Where the quality standards for each technical discipline result in deviations in the standard assessment methodology, these are described in the relevant assessments as applicable.
- 2.9.6 Definitions of the standard terms are provided below:
- negligible – imperceptible effect on an environmental resource or receptor;
 - minor – slight, very short or highly localised effect;
 - moderate – limited effect (by extent, duration or magnitude);
 - major – considerable effect (by extent, duration or magnitude) of more than local scale or in breach of recognised acceptability, legislation, policy or standards;
 - adverse – detrimental or negative effects to an environmental resource or receptor;
 - neutral – effects to an environmental resource or receptor that are neither advantageous or detrimental; and
 - beneficial – advantageous or positive effect to an environmental resource or receptor.
- 2.9.7 Moderate and major effects are generally considered to be ‘significant’ for the purposes of the EIA Regulations, in accordance with standard EIA practice although the significance assigned to a moderate effect may be subject to the judgement of the assessor.
- 2.9.8 Each of the technical chapters provides further description and definition of the assessment criteria relevant to each topic. This has been based upon quantitative and accepted criteria, together with the use of value judgment and expert interpretation to classify effects.
- 2.9.9 In general, the classification of an effect is based on the magnitude of the impact and sensitivity or importance of the receptor, using the matrix shown in **Table 2-4**, below. Where there are deviations away from this matrix (due to the technical guidance for a specific assessment topic), this is highlighted within the relevant technical chapters and the reason for the variation explained.

Table 2-4: Classification of Effects

Magnitude of Impact	Sensitivity / importance / value of a resource / receptor / group of receptors			
	Very Low	Low	Medium	High
Very Low	Negligible	Negligible	Negligible	Minor
Low	Negligible	Negligible	Minor	Moderate
Medium	Negligible	Minor	Moderate	Major
High	Minor	Moderate	Major	Major

2.10 Cumulative and Combined Effects

- 2.10.1 Cumulative effects (inter-project effects) are those that accrue over time and space from a number of development activities. The impacts of the Proposed Development are considered in conjunction with the potential impacts of other projects or activities which are either existing and/or approved and which are located within a realistic geographical scope where environmental impacts could act together to create a significant overall effect on a receptor and where sufficient environmental information is available.
- 2.10.2 Interactions or combined effects (intra-project effects) are those resulting from impacts arising as a result of the Proposed Development impacting on any one resource or receptor that may collectively cause a significant overall effect.
- 2.10.3 Cumulative and combined effects are considered in more detail at **ES Volume II, Chapter 14: Cumulative Effects and Interactions**.

3 THE SITE AND SURROUNDINGS

3.1 Location

- 3.1.1 The Site boundary is shown in **ES Volume IV, Figure 1: Site Location Plan** and **ES Volume IV, Figure 2: Aerial Context Plan**. The Site is located approximately 6.5 km south of Mold and 12 km west-north-west of Wrexham, at Grid Ref SJ 218565, with postcode CH7 4QW.
- 3.1.2 The Site covers an area of 22 hectares. It predominantly occupies a disused quarry in the south area, and the northern area comprises several ponds, grassland, vegetation and woodland. The easternmost corner of the Site is grassland.

3.2 Surroundings

- 3.2.1 The surrounding landscape is farmland or moorland with drystone walls and overgrown, vegetated field boundaries. Trees have established themselves intermittently along the boundary of the Site.
- 3.2.2 The closest residential receptors are located immediately adjacent to the Site include:
- Woolly Experiences therapy farm is adjacent to the Site to the east.
 - Agm Tree Surgery is adjacent to the Site to the east.
 - Lllys Onnen North Wales Holiday Cottages is adjacent to the Site to the east.
 - Maes Y Droell Farm is to the west, with residential dwellings and a farm located between the Site boundary and 100 m from the Site to the west.
 - The Rose & Crown pub is adjacent to the south of the Site.
 - Maes Gwyn residential cluster is approximately 190 m west of the Site.
 - Residential dwellings are adjacent to the Site and approximately 230 m to the southeast along Graianrhyd Road.
 - Maes y Droell Farm is approximately 280 m east of the Site.
- 3.2.3 Nearby settlements within 3 km of the Site include:
- Treuddyn, located approximately 3 km northeast of the Site.
 - Eryrys, located approximately 1.8 km northwest of the Site.
 - Pant-y-ffordd, located approximately 2 km northeast of the Site.
 - Rhydtalog, located approximately 2 km southeast of the Site.

- Parc Farm Holiday Park/Vale holiday Parks, located approximately 2 km southwest of the Site.
- Llanarmon-yn-Ial, located approximately 2.6 km west of the Site.

3.3 Designations

Landscape

- 3.3.1 The Site falls within the National Landscape Character Area (NLCA) 12: Bryniau Clwyd/Clwydian Range (NRW, 2023).
- 3.3.2 The Clwydian Range is characterised by its extensive upland ridge characterised by rounded, heather-clad hills, dramatic limestone outcrops and summits. The area is distinguished by Iron Age hillforts, long-standing mineral landscapes, and a strong blend of Welsh and English cultural influences shaped by its historic position between the Vales of Clwyd and Llangollen.
- 3.3.3 The northern part of the Site lies within the Clwydian Range and Dee Valley National Landscape (formerly Area of Outstanding Natural Beauty or AONB), which runs from Prestatyn in the north to Llangollen in the south. The National Landscape largely lies in Denbighshire, but its eastern fringe is in Flintshire and southern extent in Wrexham.
- 3.3.4 The northern area of the Site will fall within the proposed Glyndwr National Park, which is based on the existing Clwydian Range and Dee Valley National Landscape. At the time of writing, the proposed National Park is not currently designated.
- 3.3.5 At the local level, as set out in the Conwy and Denbighshire Landscape Sensitivity and Capacity Assessment for Wind Energy Development, the majority of the Site is located within the B1: Gritstone Hills (Graianrhyd) landscape unit, with the western edge of the Site falling within the C2: Limestone Farmlands (Llandegla to Maeshafn) landscape unit. The B1: Gritstone Hills (Graianrhyd) landscape is described as a medium-scale landscape characterised by a gently undulating landform, a mosaic of pasture and broadleaved woodland, and notable human influences, including scattered settlements, pylons and quarrying activity. In contrast, the C2: Limestone Farmlands (Llandegla to Maeshafn) landscape is described as a medium to large-scale, strongly undulating upland limestone landscape comprising farmland, wooded hillsides and small dispersed settlements.

Ecology and Biodiversity

- 3.3.6 There are **three** internationally designated statutory ecological designations located within 10 km of the Site:
- 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.
 - Alyn Valley Woods/Coedwigoedd Dyffryn Alun SAC is located approximately 5.5 km north of the Site.

- Two of the Deeside and Buckley Newt SAC Sites lie approximately 10 km northeast from the Site.

3.3.7 There are no RAMSAR sites or Special Protection Areas (SPAs) within 10 km of the Site.

3.3.8 There are four nationally designated statutory ecological designations within 2 km of the Site:

- Bryn Alyn SSSI, approximately 2.5 km northwest of the Site.
- Glaswelltiroedd Eryrys (Eryrys Grasslands) SSSI, approximately 1.3 km northwest of the Site.
- Graig, Llanarmon-yn-Ial SSSI, approximately 1.2 km west of the Site.
- Llandegla Moor SSSI, approximately 1.3 km south of the Site.

3.3.9 There are no National Nature Reserves, nor Local Nature Reserves within 2 km of the Site.

3.3.10 There are twenty-four Local Wildlife Sites (LWSs) located within 2 km of the Site boundary. These are set out in **ES Volume III, Appendix 11.1: Ecological Impact Assessment (EcIA)**.

3.3.11 Parcels of Ancient Woodland are present within 2 km of the Site. The nearest areas of ancient semi-natural woodland are located approximately 700 m to the west, 850 m to the south-west and 950 m to the east. An area of restored ancient woodland is also located approximately 750 m to the north-east of the Site.

Cultural Heritage

3.3.12 There are no World Heritage Sites or Registered Historic Parks and Gardens within 2 km of the Site.

3.3.13 There are **three** Scheduled Monuments (DataMapWales, 2021) within 2 km of the Site;

- Nercwys Mountain Cairn located approximately 1.9 km north of Site.
- Pentre round barrow located approximately 2 km northeast of Site.
- Llyn Cyfnwy Round Barrow located approximately 1.4 km south of Site.

3.3.14 There are **eight** Listed Buildings (DataMapWales, 2021) within 2 km of the Site;

- Mine Chimney at Castell (Grade II) 200 m west of Site.
- Barn and Stable Range at Bryn Ffynnon (Grade II) located approximately 700 m west of Site.
- Bryn Ffynnon (Grade II) located approximately 700 m west of Site.
- Cartshed Range at Bryn Ffynnon (Grade II) located approximately 700 m west of Site.

- Graig Farmhouse and Outbuildings (Grade II) located approximately 1.2 km west of Site.
- Plas Du (Grade II) located approximately 1.7 km west of Site.
- Chimney at the former Nant Lead-mine (Grade II) located approximately 1.8 km northwest of Site.
- Engine House at the former Nant Lead-mine (Grade II) located approximately 1.8 km northwest of Site.

Water

- 3.3.15 The nearest watercourses comprise small streams located to the west and east of the Site. Land immediately south of the Site lies within Flood Zone 3, whilst a number of existing surface water features within the Site are identified as Flood Zones 2 and 3.
- 3.3.16 The Site does not fall within or near a TAN 15 Defended Zone (NRW, 2025).
- 3.3.17 The entire Site lies within a Nitrate Vulnerable Zone (DataMapWales, 2017).
- 3.3.18 The Site does not lie within a Source Protection Zone (DataMapWales, 2026).
- 3.3.19 The Site is not located within a Drinking Water Protected Area (groundwater) that is at risk (DataMapWales, 2024).
- 3.3.20 The Site borders a Secondary A and Secondary undifferentiated superficial deposit aquifer to the south of the Site, the Site also lies in a small section of Unproductive aquifer in the northern parcel where the net benefit for biodiversity will take place. The entire Site lies within a Secondary A bedrock aquifer (NRW, 2023).

Air Quality

- 3.3.21 There are no Air Quality Management Areas within the Site or within the vicinity (Air Quality in Wales, accessed 2026).

Public Rights of Way

- 3.3.22 There are no National Cycle Networks within 2 km of the Site.
- 3.3.23 The Offa's Dyke Trail passes within approximately 4.5 km to the west.
- 3.3.24 Three Public Rights of Way (PRoW) cross into the Site, including:
- 3.3.25 Bridleway ref. 515/17 traverses the Site east–west, connecting Eryrys Road to the west with Llynwern Road to the east, and divides the Site into distinct northern and southern areas.
- 3.3.26 Footpath ref. 515/18 leaves the southern boundary of the north Site heading north and, once past the cemetery, forks into two paths continuing northwards.
- 3.3.27 Footpath ref. 515/15 crosses the southern part of the Site. The history of Public Footpath 515/15, including whether it was formally diverted, is unclear. However, it is considered

reasonably certain that no separate diversion order was secured outside the area covered by the planning permission. The footpath can no longer be reinstated along its original alignment. Furthermore, the currently signposted route has become heavily overgrown with bramble and holly and is impassable in places.

- 3.3.28 Numerous additional footpaths are located near the site boundary. Footpath 515/99 starts adjacent to the Site in the west and heads west. Footpaths 515/87 and 515/16 begin next to the site boundary in the west before heading west away from the Site.

Geology

- 3.3.29 The Site falls entirely within the Cefn-y-fedw Sandstone bedrock. To the south of the boundary lies superficial deposits of alluvium-clay, silt, sand and gravel and till, devensian-diamicton of which aligns with the aquifers identified above (British Geological Society, 2026).

Soil

- 3.3.30 The majority of the Site is Agricultural Land Classification Grade 4 and 3b. The northern part of the Site is mainly Grade 4, and the southern part is generally Grade 3b with Grade 4 in the centre of the Site. There are minimal patches of Grade 5 and non-agricultural land scattered throughout (DataMapWales, 2019).

Access

- 3.3.31 The access into the Site is taken from the unnamed road that links Graianrhyd and Eryrys. It is a 'bellmouth' style opening, 375 m north of the junction with Graianrhyd Road, with double width gates at a point where the carriageway widens to 9 m over a length of 60m. The entrance surface is hard bound for a minimum distance of 30 m into the Site. There is adequate space for parking for several Heavy Goods Vehicles (HGVs) as well as light vehicles used by employees and visitors.

Other Matters

- 3.3.32 There are no Historic Landfill Sites within 2 km of the Site (DataMapWales, 2024)
- 3.3.33 The Site does not fall within a Green Belt.

4 PROPOSED DEVELOPMENT

4.1 Introduction

- 4.1.1 The purpose of this Chapter is to provide a full description of the Proposed Development, the proposed method of working and relevant operational details.
- 4.1.2 It provides a summary of the proposed mineral extraction operations, associated infrastructure, restoration strategy and embedded mitigation measures that have informed the ES.
- 4.1.3 Quarrying has taken place at Maes y Droell for over a century, and the Site has been subject to a number of historic mineral planning permissions, resulting in a complex and fragmented planning position. The quarry is currently inactive, with parts of the Site worked, exhausted, or only partially restored in accordance with earlier permissions.
- 4.1.4 The Proposed Development comprises the extraction of high-grade industrial sand, in tandem with the progressive restoration of the Site. Full planning permission is sought for the winning and working of industrial sand and associated minerals, together with the restoration of the Site to a nature conservation focussed end use. The Site extends to approximately 22 hectares and encompasses the entire quarry.

4.2 Development Proposals

- 4.2.1 The development proposals are to resume the winning and working of high-grade industrial sand within the previously operational quarry and extend the quarry into the undeveloped/unquarried northern area. The Site would be progressively and continuously restored from the outset of operations.
- 4.2.2 The phasing plan describes the processing of previously worked spoil material as well as virgin material. The proposal includes four phases within the Site, starting with re-operations in the south, then in existing quarried areas east of the Site, before continuing to the north.
- 4.2.3 The Proposed Development also incorporates progressive restoration, ensuring that worked areas are restored in a timely and coordinated manner alongside ongoing extraction.
- 4.2.4 When temporary quarrying operations cease in between 15 - 20 years' time, the Site will be finally restored to nature conservation after uses and retained as such in perpetuity.

Mineral reserves and timescales

- 4.2.5 Site investigations by a specialist engineering company have identified a significant reserve of industrial sand at the Site, with approximately 960,000 tonnes of recoverable mineral. In addition, there is likely a further 160,000 tonnes of mineral underlying the silt lagoons, demonstrating the presence of a substantial mineral resource capable of supporting a long-term extraction operation.
- 4.2.6 There are also likely potential reserves of sand within the tips and infilled areas in the northern part of the quarry, which could be processed to produce saleable construction or

industrial sand products. These areas have been tipped previously and have not been the subject of a formal restoration scheme.

- 4.2.7 In summary, the Proposed Development would likely allow for a maximum annual output of up to 300,000 tonnes taking account of site infrastructure. It is anticipated that actual output would more realistically be 125,000 – 150,000 tonnes per annum, taking account of operational constraints and market fluctuations. Temporary quarrying operations and restoration, when allowing for mobilisation on-site and periods of quarry development would place over a period of between 15 to 20 years.

Site Preparation Works and Access

- 4.2.8 Ecological mitigation will be carried out early in the development, particularly in the eastern and southern areas of the Site. This will include measures to protect birds and bats, including the retention of appropriate habitat, as well as the creation of additional Great Crested Newt (GCN) ponds at the outset of operations. Further habitat creation and ecological improvements will be delivered progressively as restoration advances.
- 4.2.9 Where present, soils will be stripped and stored separately, with topsoil and subsoil placed in dedicated storage bunds.
- 4.2.10 Advance planting and gap planting of trees and shrubs along the northern, eastern and western boundaries of the south Site would take place. The intention would be to filter and further screen views of the Site and Proposed Development from surrounding residents and Public Rights of Way (PRoW).
- 4.2.11 Vegetation within the Site will be cleared in phases, starting in previously tipped areas and progressing from south to north. As set out above, most boundary vegetation will be retained and enhanced to maintain screening. A managed route will be provided to accommodate the Bridleway (ref. 515/17) crossing between Phases 3 and 4.
- 4.2.12 Surface water and groundwater drainage will be installed during site preparation to direct water to the southern part of the Site and ensure surface runoff remains within the quarry.
- 4.2.13 Circa 4 m high noise screening bunds along parts of the eastern and north-western boundaries of the south Site would be formed, in line with advice stemming from environmental studies undertaken during the application preparation phase. The soil storage mounds will assist in minimising any potential visual and noise impact of the operation on sensitive receptors.
- 4.2.14 Permanent earth screening bunds would be formed along the southern boundary of the north Site adjacent to the cemetery, in order to mitigate close-range views (to be implemented during initial operations in the south Site). The bund would be seeded and advance planted, meaning as vegetation establishes on the bund, the activity visible and views of the Site generally would be reduced.
- 4.2.15 Lighting is to be minimised across the Site, designed to ensure minimal light-spill when is use during working hours only. This would be primarily in the processing area, or would be task-specific lighting.

- 4.2.16 The quarry plant area in Phase 2 will be cleared and levelled to around 325 m Above Ordnance Datum (AOD), with utilities connected from the existing services on the western side of the Site.
- 4.2.17 The proposed processing plant will require up to 30 cubic metres of water per hour when operating at full capacity. To supply this water, the applicant proposes to install a borehole in the northern part of Phase 3, where previous groundwater investigations have confirmed that a sufficient water supply is available, associated with underground fault zones.
- 4.2.18 Progressive restoration would be carried out throughout the proposed phased operations to minimise the extent of operations within the landscape.
- 4.2.19 Access from the plant site onto the local highway network will continue to be via the established quarry access at the entrance to the Site at Grid Ref SJ216565 on the minor road from Graianrhyd to Eryrys.

Mineral Winning and Working

- 4.2.20 The phased quarry development scheme provides for the progressive extraction of industrial sand. **ES Volume IV, Figures 3 to 6** show the working phases, Site access, plant locations, evolving haul roads and extraction sequence. They also illustrate the progressive restoration that would deliver the concept scheme shown on **ES Volume IV, Figure 7: Restoration Indicative Quarry Development Plan**.

Phases

Phase 1

- 4.2.21 Phase 1 will take place in the southern area of the Site and will involve reworking previously disturbed ground, including the removal of stockpiles and tip material. Excavation will extend down to approximately 300 m AOD. Works will include constructing a new internal access ramp and progressively backfilling voids with residual material.
- 4.2.22 Restoration will be completed in sub-phases and will include grading, seeding and planting along sensitive boundary treatment. Planting will focus on native woodland and acid grassland areas to improve biodiversity and provide visual screening. The existing waterbody at the southern end of the Site will be retained and incorporated into the final design.

Phase 2

- 4.2.23 Phase 2 focuses on the central area of the Site and will involve deepening the excavation from approximately 335 m AOD to 325 m AOD. Partial restoration will follow, with material placed back into the void. Once material is extracted, the permanent processing plant will be located in this area.

Phase 3

- 4.2.24 Phase 3 includes a series of excavations to progressively lower the ground level from 330 m to 315 m AOD. This phase also includes the construction of new access ramps and the excavation of the previous access road. Materials extracted include both high-quality sand and silt, and restoration will be carried out progressively as areas become available.

Phase 4

- 4.2.25 Phase 4 is the final extraction phase and takes place in the northernmost part of the Site. It involves the removal of sand and silt. Restoration will follow immediately after extraction, using residual materials. The final landform will include water bodies and marginal vegetation, designed to support biodiversity and integrate with the surrounding landscape, particularly with the nearby Clwydian and Dee Valley National Landscape. Planting will include native woodland and acid grassland, alongside wetland scrapes to improve hydrology and ecological resilience.
- 4.2.26 The diversion of the footpaths associated with Phase 4, which would run around the western edge of the Site, will be implemented at the commencement of soil stripping operations within Phase 3. This phased approach will ensure that alternative routes are established and available for use well in advance of extraction activities commencing within Phase 4, maintaining continuity of access for users of the PRow network.
- 4.2.27 All soils stripped will be handled in accordance with the prevailing Institute of Quarrying Guidance (or equivalent) for the handling of soils to ensure soil resources are protected and retained for use in the restoration of the Site. Where restoration areas have reached their approved final landform, soils will be placed directly onto those areas. Where this is not possible, soils will be temporarily stored on land located between the newly diverted footpaths and the Phase 4 extraction area, around the periphery of the cemetery.
- 4.2.28 These soil storage areas will be used to facilitate the establishment of advance screen planting. The proposed planting will provide both visual and environmental benefits, helping to integrate the development into the surrounding landscape and creating a vegetated buffer between the diverted footpaths and future quarry operations. Importantly, the planting will be established several years before extraction commences within Phase 4, allowing sufficient time for vegetation to mature and provide effective screening for footpath users and nearby receptors.

Operational works

- 4.2.29 The Site is proposed to operate for up to 50 weeks per year, with a two-week shutdown period.
- 4.2.30 The sand will be extracted by surface extraction methods only, without the need for blasting. Sand will be excavated from the quarry by a front-wheel-loading shovel and transported by a dump truck to the processing plant located within Phase 2. A maximum of three dump trucks would operate on-site at any one time.
- 4.2.31 At the processing plant, oversized material will be crushed where necessary, and the extracted material will be washed and graded into different size fractions at a processing rate of up to 120 tonnes per hour. Fine material not retained by the filter press will be discharged to on-site settlement lagoons. Processed product will be stored within stockpiles in Phase 3, adjacent to the site entrance where possible, to minimise internal HGV travel distances. A network of internal haul roads will provide access between the extraction, processing and restoration areas.

Plant and Equipment

4.2.32 The operational plant and equipment required for the quarry would be procured following the grant of planning permission. The indicative plant list set out below has been developed using typical quarry plant assumptions for the type of operation proposed and associated sound power data derived from BS 5228-1:2009+A1:2014, *Code of Practice for Noise and Vibration Control on Construction and Open Sites*. Any plant brought onto the Site would be selected and operated to ensure compliance with the relevant noise limits and guidance contained within MTAN 1 and Technical Advice Note (TAN) 11: Noise.

4.2.33 An indicative schedule of the anticipated plant and equipment is provided below.

Table 4-1: Assumed Operational Plant and Equipment

Operational Activity	Plant type
Mineral Processing (Phases 1-4)	Loading Shovel
	R Series / AGGMAX / HYDROGRADE
	EVOWASH / GMAX
	Sand Stockpile Conveyors
	Feed Conveyor
	AQUACYCLE
	Static Screen
	Chemical Dosing Plant
	Overband Magnet
	Control Cabin
	Agitators
	Filter Press
	Sludge Pump
	Cloth Wash Pump
	Carbon Filters
HGV Movements (Phases 1-4)	Lorry
Excavation (Phases 1-4)	Tracked Excavator
	Articulated Dump Truck
	Articulated Dump Truck (tipping fill)
Backfilling / Restoration	Tracked Excavator
	Articulated Dump Truck
	Articulated Dump Truck (tipping fill)
	Dozer

4.2.34 A wash plant would be installed to process re-worked tipped material and virgin sand. The maximum throughput of the proposed wash plant would be approximately 120 tonnes per hour, enabling the efficient processing of industrial sand extracted from the quarry. The plant

would have a power requirement of around 750 kW, reflecting the specialist nature of industrial sand processing and the need to operate a number of high-capacity pumps and associated equipment. Water throughput is anticipated to be between approximately 20 - 30 cubic metres per hour, with water playing an important role in the washing, classification and separation of the mineral product.

- 4.2.35 All mobile and relevant fixed plant operating on-site would be fitted with modern 'white noise' reversing alarms. These alarms are designed to provide a more localised and less intrusive warning signal than traditional tonal alarms, thereby assisting in reducing potential disturbance to nearby receptors whilst maintaining high standards of site safety.

Water Supply

- 4.2.36 The Applicant proposes to excavate the upper sandstone above the groundwater table, which, based on groundwater level monitoring, is considered to be at a sufficient depth to allow initial quarrying to proceed without the need for dewatering. Therefore, no dewatering is proposed, with excavations to remain above the water table.
- 4.2.37 To facilitate the proposed water supply, monitoring boreholes would be installed using a small, temporary drilling rig over a period of approximately six weeks. Following completion of the drilling works, the rig would be removed from the Site, and no permanent above-ground infrastructure would remain.
- 4.2.38 One or more boreholes would provide a long-term water supply for quarry operations, including the wash plant and wheel wash facilities. The installation of the boreholes constitutes development and is therefore addressed as part of this planning application, while water abstraction would be regulated separately through the abstraction licensing regime.

Control over Noise and Dust

- 4.2.39 Controlling the generation of noise and dust and reducing their effects to a minimum is a key component of effective quarry management. As such, limitations and control measures are embodied in mineral planning policy, best practice guidance and any grant of planning permission by way of detailed planning conditions.
- 4.2.40 The sand at the Site is typically damp so should not regularly create fugitive/nuisance dust to a level that causes any wider nuisance or significance. Management focus would therefore be during periods of dry and windy weather to tailor activities and mitigation, accordingly, e.g. utilising a water bowser to dampen haul roads during dry periods.
- 4.2.41 Noise and dust management will continue to be undertaken under a management procedure supervised by the appointed quarry manager and will continue to be the subject of planning conditions pursuant to the grant of any planning permission issued by the DCC.
- 4.2.42 Respirable crystalline silica is not considered to give rise to significant effects on public health in the context of the Proposed Development, which is for the extraction of sand and rudimentary processing by way of washing and screening before onwards transportation. This is consistent with Health and Safety Executive guidance, which confirms that no cases of silicosis have been documented amongst members of the general public in Great Britain and indicating that environmental exposures to silica dust are not sufficiently high to cause this occupational disease (Source: Health surveillance for those exposed to respirable crystalline silica (RCS) - Supplementary guidance for occupational health professionals

(amended May 2026). Occupational workplace control measures and worker protection would be provided by the operator, in line with pre-existing and any evolving health and safety requirements.

Hours of operation

- 4.2.43 Mineral extraction and export would take place between:
- 07:00–19:00 Monday to Friday; and
 - 07:00–14:00 Saturdays.
- 4.2.44 No mineral extraction or export would occur on Sundays, Bank Holidays or Public Holidays.
- 4.2.45 Processing operations would be undertaken during approved working hours in accordance with the planning permission

Transport (Output)

- 4.2.46 At full production, the operator anticipates up to 60 loaded HGV departures from the Site on a full working day, equivalent to up to 120 two-way HGV movements. The Site would operate six days per week, Monday to Saturday. Sand would be exported in 20 tonne loads. This level of transport equates to a maximum annual output of 300,000 tonnes per annum.
- 4.2.47 All vehicular access from the public highway will use the existing access. This will be upgraded internally to ensure that there is adequate HGV and light vehicle parking and that the swept path enables easy access to the new haul road as shown on the Phasing plans. All vehicles will arrive at the access from, and depart towards, the south.

Public Rights of Way

- 4.2.48 The Proposed Development has been designed to maintain public access wherever practicable whilst ensuring safe quarry operations.
- 4.2.49 Where PRoW are affected by mineral extraction activities, temporary diversions will be provided to maintain public access and ensure safe separation from operational areas.
- 4.2.50 Bridleway No. 515/17 runs east–west across the Site, dividing it into northern and southern sections. The bridleway will remain open throughout the quarry’s operational life. The route will continue to provide connectivity across the Site, with appropriate management measures implemented as required to ensure user safety.
- 4.2.51 Footpath No. 515/18 will be temporarily diverted around the perimeter of the Site during Phase 4 mineral extraction activities. The diversion will maintain connectivity whilst avoiding active working areas.
- 4.2.52 Footpath No. 515/15 will be formally diverted along its current alignment to the south of the Site, rejoining its original emergence point to the east of the application area. The route will be cleared to a minimum width of 1.2 metres and, where necessary, will be fenced and provided with a suitable unbound surface to ensure safe and convenient public use.

Restoration and Aftercare

- 4.2.53 Restoration would be undertaken progressively alongside mineral extraction and completed following the cessation of quarrying operations. Habitat creation areas are proposed in the far east and south of the Site.
- 4.2.54 The restoration scheme has been designed to deliver substantial biodiversity and landscape enhancements through the creation of:
- Native broadleaved woodland;
 - Heathland and acid grassland habitats;
 - Wetland features and ephemeral ponds;
 - Scrub and mosaic habitats; and,
 - Ecological connectivity across the Site.
- 4.2.55 Whilst restoration obligations may arguably remain in respect of some previously permitted areas, these are generally based on historic planning conditions that may no longer reflect current best practice and may not provide a comprehensive restoration outcome. The Applicant therefore proposes to incorporate all previously worked areas within a single restoration strategy, delivering a coordinated and comprehensive scheme for the whole Site and securing environmental benefits on a greater scale in perpetuity.
- 4.2.56 A concept restoration scheme is presented at **ES Volume IV, Figure 7: Restoration Indicative Quarry Development Plan**. It is anticipated that the detailed restoration design will be developed and submitted for approval on a phased basis as extraction progresses and final landform contours are established, in accordance with the requirements of any planning conditions attached to the permission.
- 4.2.57 There is no proposal to import fill material to raise levels on the Site.
- 4.2.58 Following restoration, the Site would enter an aftercare period to ensure successful habitat establishment and long-term management.

4.3 Design and Management Measures (Embedded Mitigation)

- 4.3.1 All human development has the potential to have an environmental impact; sustainable development seeks to reduce or avoid the impacts to a satisfactory level. As explained above, the focus of EIA is to identify and address significant effects through mitigation.
- 4.3.2 Mitigation was described by the DETR in 1997 as:
- “any measures which are incorporated into the design or implementation of a development project for the purpose of avoiding, reducing, remedying or compensating for adverse environmental impacts. It may also include measures to create environmental benefits.”*

- 4.3.3 For the purposes of this ES, embedded mitigation measures are those existing measures that are included within the Proposed Development to avoid or prevent impacts e.g. screening mounds, control and management measures for the management of dust / hours of working / use of specific plant and machinery, ongoing noise monitoring and reporting etc. Embedded mitigation measures are therefore taken into account for each topic (where relevant) when assessing the potential significance of effect.
- 4.3.4 These measures form an integral part of the scheme and have been taken into account within the technical assessments reported elsewhere in this ES.

Landscape and Visual

- 4.3.5 The design approach has prioritised minimising the visibility of the Proposed Development, impacts upon landscape character and views from nearby residents, road users, PRoW, and recreational users.
- 4.3.6 Mitigation to be implemented at the outset and during the operations includes:
- 4 m high noise screening bunds along parts of the eastern and north-western boundaries of the south site;
 - Permanent screening bund along the southern boundary of the north site adjacent to the cemetery to mitigate these close-range views (to be implemented during initial operations in the south site). The bund would be seeded and planted with advance tree and shrub planting and as vegetation establishes on the bund, its appearance would be softened;
 - Advance planting and gap planting of trees and shrubs along the northern, eastern and western boundaries of the south site to filter and screen views of the Site and Proposed Development from surrounding residents and PRoW;
 - Lighting to be minimised across the Site, designed to ensure minimal light-spill and used within working hours only primarily in the processing area, or task-specific lighting;
 - Progressive restoration would be carried out throughout the proposed phased operations to minimise the extent of operations within the landscape; and,
 - As an enhancement to the Site and its context, it is also proposed to improve ease of use of the footpath on the south-eastern boundary of the south site (Denbighshire Footpath 515/15) by thinning scrub. This will improve access for users of the footpath, which at present is narrow and restricted in places by adjacent thorny vegetation.

Ecology and Biodiversity

- 4.3.7 Mitigation has been incorporated into the design and phasing of the Proposed Development in accordance with the mitigation hierarchy. Progressive quarrying and restoration will enable compensatory habitat to be created in advance of habitat loss where required. A network of waterbodies and connected habitats will be maintained throughout, including the retained eastern woodland corridor and areas in the north-east of the Site.

- 4.3.8 Measures for great crested newts (GCN), reptiles and other protected fauna include the phased provision of suitable aquatic and terrestrial habitat. GCN mitigation will be supported by a long-term management and monitoring strategy and the necessary European Protected Species Mitigation licence. Where required, GCN and reptiles will be relocated in accordance with the agreed strategy, with refugia and hibernacula incorporated into restored habitats.
- 4.3.9 The existing bat roost within the quarry buildings will be retained and safeguarded, with no demolition or alteration of these buildings proposed.
- 4.3.10 Trees requiring removal will be assessed for bat-roosting potential before felling. Ecological enhancements will include a Cathedine-type night roost for lesser horseshoe bats, bat and bird boxes, and pine marten boxes.
- 4.3.11 An Environmental Management Plan (EMP) will set out measures to control dust, noise, vibration, litter and pollution, protect retained habitats and safeguard wildlife. Excavations will be secured or provided with escape routes, while perimeter fencing will maintain wildlife movement across the Site.
- 4.3.12 Vegetation clearance will, where practicable, occur outside the bird breeding season. Where this is not possible, appropriate ecological checks and supervision will be undertaken. Pre-commencement badger surveys will also be completed before each phase of quarrying.
- 4.3.13 Following extraction, the Site will be progressively restored to a managed mosaic of habitats, with long-term management and monitoring of GCN habitat. With these embedded measures, the EcIA concludes that no significant long-term residual ecological effects are anticipated, with beneficial habitat effects expected over the medium to longer term.

Cultural Heritage and Archaeology

- 4.3.14 The potential for effects relating to cultural heritage and archaeology is mitigated during the design stage and through the adoption of best working practices.
- 4.3.15 Other measures include:
- Site walkover after scrub clearance;
 - Strip Map and Sample under the supervision of an archaeologist; and,
 - A watching brief may also be appropriate during extraction on the vicinity of the former lead mine area.

Traffic and Transport

- 4.3.16 Embedded mitigation measures for traffic and highways include the retention of the previously established HGV routing and existing site access point.
- 4.3.17 Other measures include:
- surfacing on the site access road and the use of existing wheel wash facilities near the mouth of the access road;

- routine inspection of the condition of the site access road and highway adjacent to the site access;
- requirement for all vehicles leaving the quarry to be sheeted; and,
- when possible, to do so, the operator will seek to minimise the number of HGV trips on the highway network through careful scheduling and use of vehicles with greater carrying capacity thereby reducing the frequency of movements.

Hydrology and Hydrogeology

- 4.3.18 The embedded mitigation measures relating to groundwater and hydrology are the adoption of the scheme design and best working practices.
- 4.3.19 The working scheme has embedded mitigation in the form of restricted depth in Phases 1 and 2 to prevent drawdown of the existing ponds and subsequent restriction in Phase 3 working to a depth above the water table.
- 4.3.20 In addition it is envisaged that best practice measures for the storage of oils and chemicals will be controlled through the imposition of planning conditions, as a continuation of the controls imposed on the extant permission (condition 20).

Flood Risk

- 4.3.21 The proposal is to maintain a surface water management regime where all surface water within the southern part of the Site is retained on-site. Surface water will be directed within the Site and infiltrated via surface water ponds to the groundwater.

Noise

- 4.3.22 The Proposed Development proposes a series of 4 m high noise screening bunds and / or acoustic fencing along the eastern and north-western boundaries of the processing areas.
- 4.3.23 In addition, best practicable means (BPM) will be employed to control noise. These can include, but are not limited to:
- Avoid unnecessary revving of engines and switch off equipment when not required;
 - Keep internal haul routes well maintained and avoid steep gradients;
 - Use rubber linings in, for example, chutes and dumpers to reduce impact noise;
 - Minimise drop height of materials;
 - Start up plant and vehicles sequentially rather than all together;
 - Maintain good communication with residents to advice of any planned noisy works and inform of likely duration;
 - All plant and machinery to be regularly maintained;

- Internal haul routes to be well maintained and have as low a gradient as possible;
- Unnecessary revving of engines to be avoided; and,
- Plant to be switched off when not in use.

Air Quality and Dust

- 4.3.24 The Proposed Development includes a number of good designs and best practice measures in relation to air quality/dust.
- 4.3.25 These include:
- Phased extraction and restoration to limit exposed ground and reduce dust;
 - Progressive seeding and planting to stabilise surfaces;
 - Extraction within the quarry void (27m below ground) to reduce wind and dust spread;
 - Wheel wash facilities to prevent dust on public roads;
 - Well-designed haul roads, speed limits, and routing away from nearby properties;
 - Retained and enhanced vegetation, including woodland screening near sensitive receptors. Use of lagoons for fines to prevent drying and airborne dust; and,
 - Dust Management Plan with monitoring and mitigation, including water suppression, road sweeping, haul road maintenance, covered HGVs, reduced drop heights, minimal handling, and good stockpile management.

5 ENVIRONMENTAL CONTEXT AND REASONABLE ALTERNATIVES CONSIDERED

5.1 Introduction

5.1.1 Schedule 4, Part II of the EIA Regulations requires an ES to include:

“A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effect”.

5.1.2 In circumstances where no formal alternatives have been identified or appraised, there is no policy or legislative requirement for alternatives to be retrospectively generated or assessed.

5.1.3 This approach is consistent with established EIA practice and relevant case law, which confirms that the requirement to consider alternatives extends only to those which have been genuinely considered by the applicant and are realistic and reasonable within the context of the development in question.

5.1.4 In this context, consideration of certain alternatives, most notably alternative locations or fundamentally different site arrangements or working practices, would be neither realistic nor reasonable. This is when taking account of the Applicant's intent not to undertake a Review of Old Mineral Permissions at the Site, but instead pursue a single site wide consent (see **Standalone Document: Planning Statement**). Put simply, the procedural route to continue the already partially consented development is being deliberately simplified by the Applicant. In addition, the existing site infrastructure and rudimentary nature of quarrying as a development form mean that, in the context of the EIA Regulations and the contemplation of likely significant effects, the consideration of realistic alternatives is very limited.

5.2 Consideration of Alternatives

5.2.1 The reasonable alternatives considered during the design and EIA process are described below. They comprise the do-nothing scenario, alternative locations, working methods, alternative phasing and alternative restoration strategies. The assessment explains why the selected scheme was preferred in light of the Site's planning history, mineral resource, operational constraints and environmental considerations.

Do Nothing

5.2.2 The 'do nothing' scenario means that the Site would remain unchanged, the planning permissions would lapse in 2042, and the Applicant and by extension relevant markets would be required to source mineral for their operations from other locations. The permitted reserve and wider resource would be sterilised and higher transport costs, both financial and environmental, would be incurred.

- 5.2.3 This option would fail to deliver the continuous supply of industrial sand to the consuming industries, contrary to policies that seek the maintenance of such supplies at the best balance of social, environmental and economic cost within the development plan and at a national level. This was not considered a reasonable alternative.
- 5.2.4 In this scenario, the quarry would likely retain a sub-standard restoration outcome that would not realise achievable biodiversity gains at the site.

Alternative Locations

- 5.2.5 As relevant planning permissions already exist for mineral working at this location, and the Applicant's land ownership extends only to the permitted Site and immediately adjacent land, no alternative locations outside the Applicant's control have been identified or assessed. The existing mineral permissions are associated with the land and are therefore intrinsically tied to specific, defined locations. It would therefore be unreasonable and inappropriate to assess alternative sites.
- 5.2.6 Additionally, in the case of mineral working, the opportunity to identify substitutes or alternative sites is limited by the prevalence and location of the geology that can produce the right materials. There is no real substitute for industrial sand due to the demanding specifications and performance requirements of the end products, as well as the consistency of the raw materials supplied to end users. In the case of silica/industrial sand, it is recognised in national and local development plan policy that the sand is nationally scarce.
- 5.2.7 In the case of silica/industrial sand, Planning Policy Wales (Edition 12) identifies certain minerals, including industrial sand, as scarce resources requiring safeguarding and prudent use a position which is reinforced by MTAN 1: Aggregates, which recognises that industrial sand can only be worked where geological conditions allow and is therefore limited in availability.

Working Methods

- 5.2.8 The working methods proposed represent current best practice in mineral production. These include proven extraction techniques that allow for economic and practical supply.
- 5.2.9 The quarry design seeks to sustainably maximise the quantity of mineral that can be recovered from the Site including through re-working of under-utilised tip material. This is a prudent use of primary mineral resources at an existing quarry, as advocated in planning policy. Beyond the adoption of modern plant and machinery that would minimise operational effects, no truly innovative working methods have been considered which could give rise to effects beyond those which have been anticipated and assessed.

Alternative Quarry Phasing

- 5.2.10 The proposed phasing and operational arrangements were selected as they respond to ecological constraints, in particular the need to translocate the Great crested newt population at the outset of operations to a location that can be retained in-situ thereafter. The proposed phasing also allows the site to be progressively restored from the outset of continued operations, meaning activity closest to nearby properties to the south of the quarry can be rapidly progressed.

- 5.2.11 Any alternative phasing would mean it is not possible to achieve early progressive restoration, including the creation of appropriate Great crested newt habitat. It would also prolong the duration of time that areas of the quarry are being worked/remain unrestored.
- 5.2.12 The phasing also takes account of the very practical issue of the processing and water management areas, including the access, being close to the centre of the site. This means a materially different phasing option is unlikely to be possible without incurring avoidable environmental impacts.

Alternative Restoration

- 5.2.13 The restoration scheme proposed for the Site has been designed taking account of the assessments and conclusions of the iterative EIA process. The EIA process has contributed directly to producing the **Restoration Indicative Quarry Development Plan (ES Volume IV, Figure 7)** which encompasses issues including:
- the existing partial restoration of the Site;
 - the availability of material on-site for use in restoration;
 - the visual effect of the restored Site in the locality; and,
 - the ability to achieve a future long-term use of the Site for nature conservation purposes.
- 5.2.14 The proposed nature conservation orientated after-use would likely deliver positive, environmental and biodiversity outcomes once temporary quarry operations cease. These would be at a landscape scale and be secured in the long-term.
- 5.2.15 The nature conservation after-use was selected in part because it responds to the Site's existing conditions, available restoration materials, landscape context and ecological opportunities. Other restoration options were not progressed because they would not provide the same clear relationship with the quarry landform or the environmental objectives established through the EIA process.

5.3 Conclusions

- 5.3.1 This ES concludes that, with the embedded and further mitigation measures identified, the Proposed Development is not expected to give rise to significant adverse environmental effects beyond those reported in the topic chapters. The Applicant considers that no other reasonable alternatives to the scheme have been identified through the design and EIA process.