

Spink Quarry, Knockbaun, Abbeyleix, Co. Laois

Spink Quarry

Environmental Impact Assessment Report

Non-Technical Summary

2021



Part of the Breedon Group

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Laois County Council Planning Authority, Viewing Purposes Only

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1 INTRODUCTION

1.1 GENERAL BACKGROUND

This EIAR pertains to the continued use and operation of an existing permitted quarry, the deepening of the quarry and the erection / operation of a concrete batching plant at Knockbaun, Spink, Co. Laois. The existing quarry is permitted under P.A. Ref. 10/383, which is for a 10 year period to work the quarry, plus two years for final re-instatement works. The site occurs on a landholding of c. 19.6 ha, which is in the ownership of the applicant, Lagan Materials Ltd. (Lagan) since its acquisition by Lagan in 2014 (Refer to Non-Technical Summary (NTS) Figures 1.2 to 1.3).

The annual extraction rate for the quarry prior to closure in 2009 was 300,000 to 350,000 tonnes per annum depending on market demand. Aggregates are not currently being extracted at the site.

The development will consist of the continued use and operation of the existing quarry including deepening of the quarry. Extraction will be confined to the existing permitted quarry area (P.A. Ref. 10/383) comprising an extraction area of c. 14.5 ha within an overall application area of c. 19.6 ha. The development will include provision of new site infrastructure, including portacabin site office, canteen, toilets, concrete batching plant and truck washdown facility, hydrocarbon interceptors, mobile crushing and screening plant, upgrading of the water management system, provision of holding tank for wastewater, and other ancillaries. The proposed development will utilise/upgrade the existing in-situ quarry infrastructure, including site access, internal roads, storeroom, wheel wash, weighbridge, aggregate storage bays, refuelling hard stand, water settlement pond system, and other ancillaries (Refer to Figure NTS Figure 1.3).

The EIAR and accompanying planning application are being submitted for consideration to Laois County Council, which is the competent authority for the proposed development. The application has been prepared and compiled under the supervision of John Sheils, (B.Eng. (Mining), MSCS, MRICS) on behalf of the applicant, Lagan. John Sheils is the principal of "J Sheils Planning & Environmental Ltd" (JSPE), a company that provides planning, environmental and valuation services and specialises in the areas of mineral extraction and inert waste management. In addition to the studies within the EIAR carried out by J Sheils Planning & Environmental Ltd (JSPE), some additional technical studies have been carried out by independent consultants. These studies are incorporated within the EIAR, or are attached to the EIAR as appendices.

1.2 SITE LOCATION & DESCRIPTION

The quarry is located within the Townland of Knockbaun, c. 4 km northwest of Swan, c. 7 km south of Timahoe, c. 9.5 km east of Abbeyleix, c. 10 km north of Castlecomer, c. 13.5 km southwest of Stradbally, c. 16 km south of Portlaoise, and c. 19.5 km northwest of Carlow Town (See Figure NTS EIAR Figure 1.1). The quarry is located on the southwest side of

Regional Road R430, which connects the town of Abbeyleix to the west with the village of Swan to the southeast.

The existing quarry comprises predominantly excavated or disturbed ground, with stockpiles of aggregate and areas of undisturbed ground. To date, extraction has taken place in the northern and central sections of the quarry lands. A section along the northern site boundary with the Regional R430 will remain undisturbed for biodiversity, protection of the Clogh Stream rising, and landscaping purposes. Details with respect to the landholding, existing planning permission and proposed application area are shown on Figure NTS 1.2.

Site infrastructure is located within the northern section of the site with a haulage route along the inside of the northern boundary from the site entrance to the processing area. The site entrance is located near the centre of the northern site boundary along the R430. The site is serviced by an existing secured, commercial style gateway with a tarmac apron and internal access road, which leads to the wheel wash and weighbridge. The northern boundary of the site is composed of hedgerow and landscaped berms, with sections of hedgerow and plant screening along much of the site boundary. The remaining boundaries of the landholding are bounded by coniferous forest and agricultural land. The existing site layout is shown by Figure NTS 1.3.

The topography of the region is that of rolling hilly landscape with the site situated on the northwestern margin of the Castlecomer Plateau. The site occurs at a maximum elevation of 261 m Above Ordnance Datum (AOD) along the southern boundary and a minimum elevation of 215 m AOD along the roadway (northeastern boundary). The surrounding lands are largely agricultural with varying degrees of intensity, with forestry plantation abutting the site to the southwest.

Hydraulically, there is a divide through the centre of the site with the catchments of the River Clogh to the east and the River Owenbeg to the west. Both rivers are part of the River Nore Catchment. A tributary of the River Clogh rises in the vicinity of the site entrance, flows subparallel to the R430, and ultimately drains into the mainstream of the River Clogh near Swan. Two tributaries of the Owenbeg River, the Knockbaun and Garrintaggart, rise south and north, respectively, of the quarry and flow to the northwest to drain into the mainstream of the River Owenbeg c. 500 m from the site. The quarry was developed on the northeast flank of a prominent NW-SE oriented ridge, with elevations reaching 261 m AOD.

The land in the wider area surrounding the quarry is typically agricultural land with dispersed farmsteads and sporadic ribbon development along roadsides. Land-use in the area consists of a patchwork of medium to small agricultural fields, which are predominantly held in pasture coniferous forest, transitional woodland scrub, and heterogeneous agricultural areas. Although pasture is the dominant land use in the wider area, there is a history of quarrying, with multiple active and disused/restored quarries in the wider area, particularly around Ballinakill and east of Swan.

Residential property in the area typically comprises one-off single residences and farmsteads along public roads and to a minor extent, along and at the end of lanes off the public roads. There are a number of residential dwellings located to the northwest of the site, particularly at Larkin's Cross, with the closest located c. 175 m west of the site. Similarly, there are widely scattered residences and farmsteads along all of the rural roads in the wider area.

The quarry is largely screened from views along the R430 with a prominent overburden mound screening the quarry from direct views from the northwest. There is open to partial views of the upper quarry face from the Local Roads L7792 and L77922 to the north (Refer to Figure NTS 1.1). More distant views are mostly obscured by intervening topography, mature hedgerows and forestry, particularly as most rural roads are lined with mature hedgerows that contribute to an enclosed landscape.

1.3 APPLICANT

The applicant, Lagan Materials Limited ('Lagan'), is part of Breedon Group plc. Breedon is a public company with ordinary shares traded on the Alternative Investment Market (AIM). Breedon is a leading construction materials group in Britain and Ireland. The company employs approximately c. 3,600 people, and operates 2 cement plants, 70 quarries, 40 asphalt plants, 200 ready-mixed concrete plants, 9 concrete and clay products plants, 4 contract surfacing businesses, 6 import/export terminals and 2 slate production facilities.

Breedon trades in the Republic of Ireland as Lagan Materials Ltd., a fully-integrated aggregates and downstream products business headquartered in Dublin. It comprises all Breedon's construction materials and contracting services businesses (aggregates, asphalt, ready-mixed concrete, bitumen, contract surfacing highway maintenance, civil engineering, and airfield construction) in the Republic of Ireland. Lagan and the wider Breedon Group are fully committed to sustainability and social responsibility.

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2 REASONABLE ALTERNATIVES

The Directive 2014/52/EU requires “A description of the reasonable alternatives (for example in terms of project 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.”

The existing site permitted under P.A. Ref. 10/383 comprises a moderate-sized hardrock quarry, which has been extensively worked with some remaining infrastructure and stockpiles on the quarry floor. The ‘Do Nothing’ alternative means all quarrying and ancillary activities would cease. The site would be restored as per the requirements of the existing planning permission (P.A. Ref. 10/383), but the resources of the quarry would remain in situ and thus unutilised at a time when the economy and construction industry are growing and demand for aggregate and concrete products is increasing.

Aggregates used in construction are generally won from hardrock quarries and sand and gravel pits. There are no reasonable alternatives in the near term to the current terrestrial sources of aggregates. Secondary aggregates cannot be relied upon as a real alternative to primary aggregates, given on-going issues with classification of end-of-waste and the very low volume of C&D waste suitable for recycling as secondary aggregates for use in construction.

Today, marine aggregates are dredged from the seabed in the UK and elsewhere around the globe, but none is being exploited in Ireland. In the absence of significant volumes of aggregates from marine and recycled/ secondary sources, terrestrial deposits, such as at Spink Quarry, will continue to be the main source of construction aggregates in Ireland.

In considering alternative locations it is a basic principle that minerals can only be worked where they naturally occur. The products are generally of low unit value such that the most significant cost is transportation. Thus, most quarries typically operate within a radius of c. 25-30 km of their market. The county towns of Portlaoise, Carlow and Kilkenny City and numerous smaller urban centres are within the natural market of the site, which is strategically located with direct access onto the R430 Regional Road.

It is generally considered preferable to allow applications for continuance of use and extensions to existing mineral workings in contrast to opening new quarries at ‘greenfield’ sites. The continued use and operation of the existing permitted quarry also has the benefit of existing infrastructure. Furthermore, an important consideration is that the site has an established history of quarry working, has proven reserves of good quality rock, and is in the ownership of the applicant.

The scale of the development refers to the scale or rate of production and is dictated by many considerations, including the volume of the resource, capital costs, and cost efficiencies. The scale of the operation under planning permission P.A. Ref. 10/383 was up to a maximum output of 350,000 tonnes per annum, but the average output of the proposed development will be closer to c. 200,000 tonnes per annum.

The layout largely relates to the logical placement of infrastructure and plant associated with the elements of the process within the area of the site. It is mainly dictated by the commercial

imperatives of process efficiency, operational efficiency and cost-efficiency, as well as environmental considerations such as noise, dust, and visual impact. As this is an established quarry with existing infrastructure, settlement pond system, and stockpiles currently in situ, the layout is largely predetermined.

The site will benefit from economy of scale in terms of being a medium scale quarry when developed with a full complement of site infrastructure and plant and machinery, as opposed to the alternative of developing a proliferation of smaller quarries in greenfield sites to meet demand.

Design more closely relates to the visual aesthetics of the development, which is less of a consideration in impermanent and screened quarries as compared to enduring public buildings or major pieces of infrastructure. Nonetheless, as negative visual impact can be a major environmental aspect associated with such developments, optimising the design alternatives is considered a priority.

Visual impacts can be resolved through a number of design solutions by varying key aspects such as the location, shape, size, orientation, colour, etc. of the facilities. However, the main site activity, including processing plant and concrete batching facility, will be sited on the existing quarry floor and will be screened by existing quarry faces and intervening vegetation, including mature hedgerows, perimeter landscaping and screening berms. As this is an established quarry, design alternatives are very limited at this point.

Conventional drilling and blasting methods will be used in the breaking of quarry rock faces. Extracted rock will be loaded by excavator or front-end loader to a mobile crushing and screening plant at the quarry face. The aggregates produced will then be stockpiled and subsequently loaded out by a front-end loader to road trucks for transport off site and/or use in the concrete batching plant. There are no viable alternatives to this widely used and conventional method of quarrying.

There are three established strategies for impact mitigation - avoidance, reduction and remedy, and thus it may be possible to mitigate effects in a number of different ways. The EIAR describes the various options and provides an indication of the main reasons for selecting the chosen options, including a comparison of the environmental effects.

3 DESCRIPTION

The description of the characteristics of the project development should consider location, site layout, design, size/scale, resource use, waste production, emissions and nuisance, and risk of accidents. The description should consider the full life-cycle of these characteristics, as they have the potential to generate different effects at different times and different places, both on- and off-site.

3.1 THE EXISTING SITE

The site is situated in the Townland of Knockbaun, Spink, Co, Laois, and is located c. 9.5 km east of Abbeyleix and c. 3.5 km northwest of Swan. Spink Quarry is located on the southwest side of Regional Road R430, which connects the town of Abbeyleix to the west with the village of Swan the southeast.

The site occurs at a maximum elevation of 255 m Above Ordnance Datum (AOD) along the southern boundary and a minimum elevation of 215 m AOD along the roadway (northeastern boundary). The surrounding lands are largely agricultural with a forestry plantation abutting the site to the south. There are no large residential settlements close to the site, with the closest at Swan c. 3.5 km to the southeast.

The site has the benefit of being strategically located on the R430 Regional Road, which connects Abbeyleix c. 10 km to the west with Carlow c. 20 km to the east southeast. The proposed haulage route for all site-related HGV traffic is therefore directly onto the R430. As such, site traffic will be immediately directed onto the regional road network and thus avoid adversely impacting the local road network.

Hydraulically, there is a divide through the centre of the site with the subcatchments of the River Clogh to the east and the River Owenbeg to the west. Both rivers are part of the River Nore Catchment. A tributary of the River Clogh rise in the vicinity of the site entrance, flows subparallel to the R430, and ultimately drains into the mainstream of the River Clogh near Swan. Two tributaries of the Owenbeg River, the Knockbaun and Garrintaggart, rise south and north, respectively, of the quarry and flow to the northwest to drain into the mainstream of the River Owenbeg c. 500 m from the site.

To date, extraction has taken place in the northern and central sections of the quarry. The quarry comprises predominantly excavated or disturbed ground, with stockpiles of aggregate and upstanding areas of undisturbed ground.

The quarry is currently permitted under P.A. Ref. 10/383 which is for a 10 year period to work the quarry, plus two years for final re-instatement works, unless, prior to the end of the period, planning permission has been granted for its extension for a further period. A copy of the planning permission is included in Appendix 2. The annual extraction rate for the quarry historically was 300,000 to 350,000 tonnes per annum.

The quarry is not currently in operation, and the asphalt plant has been removed from the site. The applicant does not intend to resume asphalt production at the site.

3.2 PROPOSED DEVELOPMENT

The development will consist of the continued use and operation of Spink Quarry, including deepening of the quarry. Extraction will be confined to the existing permitted quarry area (P.A. Ref. 10/383) comprising an extraction area of c. 14.5 ha within an overall application area of c. 19.6 ha. The development will include provision of new site infrastructure, including portacabin site office / canteen, toilets, concrete batching plant and truck washdown facility, hydrocarbon interceptors, mobile crushing and screening plant, upgrading of the water management system, provision of holding tank for wastewater, and other ancillaries. The proposed development will utilise/upgrade the existing in-situ quarry infrastructure, including site access, internal roads, storeroom, wheel wash, weighbridge, aggregate storage bays, refuelling hard stand, water settlement pond system, and other ancillaries.

The attached Site Layout Figure 3.1 shows the proposed site layout including mobile crushing, and screening plant, wheel wash, weighbridge, site office, concrete batching plant, truck washdown facility, water management ponds, quarry sump, refuelling hard stand and other ancillaries. Cross sections illustrating the quarry development are shown in Figure 3.3.

The workable reserves have been calculated at c. 5.85 million tonnes. It is proposed that the average output will be closer to c. 200,000 tonnes per annum, giving an anticipated duration for the extraction of c. 29 years. A further 2 years will be required to implement and complete final restoration of the site to a secure wildlife refuge/ amenity use. Such a duration of permission is required in order to justify the capital expenditure, and to provide for local employment and a supply of locally sourced construction aggregates and concrete.

3.3 EXISTENCE OF THE PROJECT

It is proposed to use the existing entrance to the site, which has been serving the quarry development for a number of years. Access to the proposed development is directly onto the R430 Regional Road. There is a well set-back, splayed, and paved entrance with large heavy-duty lockable metal gates. The site access junction has existing sight distances of 300–500 m west and east.

A wheelwash has been provided to ensure that the wheels and undersides of all vehicles transporting aggregate from the site onto the public road are cleaned. The weighbridge will be recommissioned on site to ensure all vehicles transporting material are weighed prior to exiting site.

There is an existing right turning lane for turning into the quarry on the western approach to the quarry access. Appropriate advance warning signage will also be provided along the R430 at locations to be agreed with the Planning Authority. The existing boundaries around the site perimeter will be maintained and will be reinforced, where necessary. The boundaries will be maintained in accordance with the operator's obligations under various health and safety legislation. The access gate is kept padlocked outside of the normal working hours.

The proposed quarry working hours are:

Monday to Friday:	07:00 to 18:00 hours.
Saturdays:	07:00 to 14:00 hours
Sundays/Public Holidays	No working except in the case of maintenance or emergency.

It is requested that the transportation of aggregates and concrete can continue to commence from site at 07:00 (Monday to Saturday). This is also in line with the planning and development Guidelines for Quarrying and Ancillary Activities issued by the DoEHLG in 2004. An early start-up is required particularly when servicing large construction projects where the concrete pour must be completed in one operation.

There will be no storage of bulk fuels on site. Servicing of vehicles will take place off site. Lubricants and any other hydrocarbons will be stored on spill pallets and appropriate mobile and non-mobile bunds. Refuelling of mobile plant will be carried out by a licenced third-party contractor. An impermeable hardstanding pad is installed in the former compound area. All hardstanding runoff passes to a hydrocarbon interceptor.

3.4 DESCRIPTION OF COMMISSIONING

On some large projects there is a considerable time delay between the end of construction and the commencement of full operation. The presence of the existing quarry means that there is little development works required apart from re-installing/ commissioning, toilets, wheelwash, weighbridge, aggregate storage bays, refueling hard stand, water settlement pond system, and other ancillaries.

The development will include provision of new site infrastructure, including site office / canteen, concrete batching plant and truck washdown facility, hydrocarbon interceptors, mobile crushing and screening plant, upgrading of the water management system, provision of holding tank for wastewater, and other ancillaries. It is envisaged that these facilities will be commissioned over a 3 to 6 month timeframe from the recommencement of quarry activities.

3.5 OPERATION OF THE PROJECT

There will be no changes to the method of extraction and processing as a result of this planning application. Drilling and blasting will continue to be utilised with processing of extracted rock using mobile crushing and screening plant located within the quarry void. This will reduce handling of material and will also have the benefit of screening these activities from outside views, and being at depth, will also mitigate impacts associated with noise and dust. The broken rock will be excavated by a combination of either a wheeled loading shovel and/or excavator. Once loaded, the excavated rock will be taken directly to the crushing plant. Blasting will be conducted typically on a monthly basis as required.

The site will be worked from the existing quarry area in a series of benches (typically 10 to 20 m) down to a final depth of 200 m AOD in the western quarry area and 190 m AOD in the eastern quarry area. The development will see the extraction of both the Clay Gall Sandstone Formation and Coolbaun Formation, which overlies the Clay Gall sandstones to the east of the existing quarry sump.

The quarry design takes into account a requirement identified in the hydrogeological study of the EIAR to maintain at least a 5 metre buffer above the contact between the Clay Gall Sandstone Formation and Moyadd Coal Formation. This will reduce the amount of water to be managed and discharged off-site.

The development will include a concrete batching plant. The plant will have aggregate storage bins comprising 5 x 100 tonne capacity, which will be fed directly by front end loading shovels / dumpers. The aggregate will be weighed in a hopper, which underlies the storage bins and transferred to the concrete batching plant via a 1 m wide conveyer. Cement will be delivered to site in bulk tankers and stored in sealed silos. A dust control system will be used to control any fugitive emissions from the cement silos. The batching unit will be enclosed to further eliminate fugitive dust.

The production of up to 15,000 m³ of readymix concrete per annum will require the importation of cement and fine aggregates. The coarse aggregate and water will be sourced from within the quarry itself. The annual volumes anticipated to be imported by the operator are; 4,500 tonnes of cement and 7,500 tonnes of fine aggregate (sand), resulting in a total importation of 12,000 tonnes per annum.

There will be no bulk fuel storage on-site. Refuelling of mobile plant will mainly be carried out by a licenced contractor.

The site straddles a mapped surface water catchment boundary that separates lands that drain naturally to the Owenbeg River to the west and the Clogh River to the east. The lands between the site and these watercourses are drained by a network of agricultural field drains and first order streams. The drainage route connecting the site to both of these rivers was assessed for their potential suitability to safely receive and transmit natural catchment flows plus an additional quarry discharge.

Hydraulic modelling of the surface water system demonstrates that the local area's surface water network can accommodate the predicted dewatering amounts, in combination with flood flows and allowances for climate change. The western route (i.e., Owenbeg River) is more suitable for safely transmitting the predicted quarry discharge.

With respect to protecting the river systems to the east of the site, the proposed quarry design makes provision for a 50 m buffer zone set back from the boundary road. A 50 m standoff from the extraction area to the R430 Regional Road will continue to be maintained. There will be no quarrying and no construction activity in this area. This standoff area will protect the rising of the Clogh River and act to screen the development from views to the north.

Discharge surface water will be limited to the pre-quarrying discharge rate in order to mitigate against downstream flooding. As quarrying progresses, a sump with a minimum available volume of 15,650 m³ will be maintained.

Waters will be pumped from the sump to the settlement pond system. The existing settlement ponds have been recommissioned and are now ready to remove particulate matter from waters prior to discharge from site. Additional clarification will be provided in the final ponds prior to discharge. The existing settlement pond systems are deemed to be adequate. The discharge to surface water will be subject to a licence to discharge to surface water as required under Section 4 of the Local Government (Water Pollution) Act, 1977.

A holding tank will be provided for wastewater management of foul water effluent. This holding tank will be routinely cleaned out by a licenced waste contractor.

With respect to an on-site supply, the site has three new production wells that can supply the site with potable water. Water quality results suggest that groundwater is of suitable quality for use at the site. It is proposed to convert one to a production well.

The proposed development of the quarry will directly employ a work force of three persons including quarry manager and general operatives. In addition to these three employees, there will be up to an additional three contractors employed on site with respect to contract crushing, screening and haulage.

3.6 SITE RESTORATION, DECOMMISSIONING & AFTERCARE

The development will be worked in a phased manner with consideration given to implementation of landscaping proposals and restoration of worked out areas (in particular the upper quarry face) to further reduce the visual impact of the development. Site restoration allows vegetation to become established during the course of the development, thereby reducing the overall impact of the development (i.e., visual impact, dust impact, flora and fauna impact, etc.). The main aim of the landscaping & restoration plan is to minimise the impact of quarrying on the existing landscape of the area both now and into the future. A further 2 years will be required to complete final restoration of the site to a secure wildlife refuge/ amenity use.

Plans and sections of the design and associated restoration are shown on Figures 3.1 to 3.3.

Working the quarry top-down in successive benches, with progressive restoration of the upper back southern face and a favourable direction of working to further reduce the visual impact of the development on the surroundings. This will ensure that the upper back face is restored at the earliest opportunity, that the working face is not open to view, and that as the quarry pushes eastwards only the restored upper face will be revealed.

The proposed development will enable the operator to fully complete the restoration of both the existing quarry and the proposed development to beneficial after-use.

The upper benches will be seeded with suitable species of shrubs and climbers to create vegetated ledges. Vegetation and natural colonisation on these benches will encourage growth on the faces and will subsequently break up the natural harshness of the exposed rock face. This will occur in a progressive manner as quarrying progresses.

This restoration/ landscaping plan includes landscaping in areas where the natural topography of the hillside partially screens the quarrying. In these areas, the existing hedgerows will be bulked up as necessary to increase the screening capacity of the hedgerows.

As discussed in previous sections, restoration of the existing and proposed site will be carried out in a progressive manner over the life of the operation. It is anticipated that final restoration will be achieved within 2 years of completion of extraction operations, and that the final restoration will be to a beneficial after-use as a secure wildlife refuge/ amenity with water feature.

3.7 CHANGES TO THE PROJECT

The proposed development has taken into consideration the landholding as a whole. It is considered that given appropriate stand-offs to sensitive receptors within the area, that the landholding can accommodate the extraction area as proposed. Further development outside of the identified area is restricted by the proximity to residential property and land ownership but would be most feasible in the forested area to the southwest of the site.

Continuation of quarrying operations in accordance with the scheme proposed will provide for the security of the existing business of Lagan for the foreseeable future, i.e., c. 29 years. Spink Quarry is an important component in Lagan's future business model.

3.8 DESCRIPTION OF RELATED PROJECTS

There are no required or apparent opportunities for any further associated developments at this time.

3.9 CUMULATIVE IMPACT

There will be no cumulative impacts resulting from the proposed development during the construction, operation, or decommissioning phases of the proposed development. There are several quarries in the Abbeyleix-Ballinakill area c. 5–8.5 km to the west, while the Lagan clay products facility are located c. 3 km to the east at Swan. As such, it is considered that there will be no significant cumulative impacts with respect to the operation of the proposed development given that the site is removed from any other extractive, industrial or commercial development in the locality.

4 POPULATION & HUMAN HEALTH

This section of the EIAR establishes the human environment in the vicinity, and assesses the potential impact, if any, of the proposed continued operation of Spink quarry at Knockbaun on the existing environment in respect of human beings. Potential negative impacts on human beings and amenity of the area arising from the development relate mainly to nuisance from noise, dust, water pollution, traffic and visual intrusion. The issues considered here include, land use, population, economy & employment, social infrastructure, amenity, tourism and recreation and health and safety.

The human environment was assessed by undertaking a desktop study and conducting visits to the site and the area.

The site is strategically located on the R430 Regional Road, which connects Abbeyleix c. 10 km to the west with Carlow c. 20 km to the southeast. The proposed haulage route for all site-related HGV traffic is therefore directly onto the R430, such that all site traffic will be immediately directed onto the regional road network and thus avoid adversely impacting the local road network.

Spink Quarry is located in the townland of Knockbaun, which is in the Electoral Division (ED) of Dysartgallen. There are numerous established individual residences, clusters of residences, hamlets or graigs in the area with 36 residences within a 1 km radius of the quarry site. The closest residence is located c. 175 m west of the site and is one of a cluster of three houses at Larkin's Cross. There are only four residences within 250 m of the site, but all but one of these residences are sheltered behind the hill into which the quarry is developed.

The community facilities in Spink include: (1) Scoil Naisiunta Molaise, Knock; (2) Knock Community Hall, Knock; (2) Knock Kids Playschool, Spink; (3) St. Laserians Church, Knock; (3) Spink Community Field and GAA Club c. 4 km west of the site; and (4) Headen's Bar in Spink. Power to local residences is provided by over-head lines. Most residential properties in the area are served by private bored wells as there is no mains supply in the area. Most houses are serviced by septic tank systems and proprietary effluent treatment systems.

The quarry has contributed indirectly to sustaining and developing the local and regional economy through the supply of building products. If the development did not proceed, the aggregate resource would remain unused in situ, and the local supply of quality aggregates and concrete products would be more restricted. Lagan expects to employ up to 3 people directly on site. It is envisaged that some additional employees may be hired as and when required by demand, while up to an additional 3 people will be employed indirectly, mainly in haulage. Thus, the development will have a positive impact with respect to supporting and maintaining the workforce in the area for the duration of quarrying activities.

As a quarry has been intermittently active at the Knockbaun site since before the 1970s, recommencement of quarry operations for mineral extraction, represents a minimal impact in the context of change in land use. The quarry has had a number of mitigation measures with respect to screening and landscaping, environmental management and monitoring put in place to ensure that operations do not result in significant impacts on the surroundings, including the human environment. On completion of site activities, the site of the quarry will

be decommissioned and left safe and secure. Furthermore, the quarry will be restored in accordance with an approved restoration scheme, and thus integrated back into the surrounding landscape with the attendant improvement to the visual amenity of the area.

There will be no significant additional visual intrusion on recommencement of quarry operations. Presently, there are only intermittent views of the workings along the R430 east of the entranceway with most views of the current quarry workings screened by existing perimeter berms and screen planting along the roadside boundary. There will be a potential moderate, medium to long term, negative impact as extraction extends to southeast during the operational phase of the development. Consideration will also be given to the direction, phasing, preservation of buffer zones and reinforcement of perimeter landscaping with respect to the eastern, northern and western site boundaries as quarrying develops.

The quarry does not lie on a designated scenic route, nor is it visible from any of the designated scenic routes and viewpoints within the wider area around Knockbaun. The hill into which the development has been driven forms a screen to all views from the west. Thus, it is considered that the development will not have any significant visual impact on the views and prospects in the county. Upon decommissioning, the site will be restored in accordance with an approved restoration scheme for the quarry so that the site is assimilated in a planned manner back into the landscape in the long term.

The site has a long history of quarrying having co-existed with other land uses in the area since the 1970s, such that property values should be unaffected by the recommencement of quarrying. Furthermore, consideration has been given to screening of the development, phasing and direction of working with respect to receptors.

There are no Seveso II establishments in either counties Laois or Kilkenny, such that Spink Quarry is not at risk of such accidents. Furthermore, the quarry lies in a sparsely populated, rural area, where the nearest industrial development is the brickworks at Swan 3 km to the southeast, indicating that the site is not vulnerable to major accidents or disasters. The greater risk of accident probably arises from the nature of the quarrying activities on-site. However, the design, construction and operation of the proposed development will be carried out in accordance with all relevant Irish and European legislation/regulations governing safety in the workplace. A 'Health & Safety Plan' will be implemented for the development in accordance with the regulations.

There are 5 Recorded Monuments (RMPs) within the 1 km study area. There are no Protected Structures (RPSs), Architectural Conservation Areas or NIAH structures or historic gardens or designed landscapes within the proposed development area or within the 1 km study area. There are no National Monuments in State Care, sites with Preservation Orders or Temporary Preservation Orders, World Heritage Sites or Candidate World Heritage Sites, or Areas of Special Archaeological Interest within the proposed development area or the 1 km study area. Thus, there will be no direct impacts on any known items of archaeology, cultural heritage or buildings of heritage or special architectural interest in the application area or the vicinity.

It is considered that there will be negligible direct impact, including operational visual impact, on the archaeological resource, with no loss of heritage values in the locality.

There will be no significant indirect, cumulative or transboundary impacts associated with the operation of the quarry. Also, based on the mitigation measures provided for, there will be no significant residual impacts in terms of community and other socio-economic issues.

Noise prediction modelling indicates that the quarry operations can be kept to acceptable levels by the implementation of good design, effective operation and management and by the implementation of measures which are deemed to be best practice.

Given the extraction method and the inert nature of the process and end product, no 'Worst Case' impacts after mitigation are apparent, other than a potential traffic accident involving a HGV from the site. However, mitigation measures will be put in place to minimize such risks.

With regard to human beings, there are no mitigations proposed beyond normal site management including phasing and progressive restoration and maintaining screening along the R430. Any impact on the natural environment will be mitigated against to the greatest degree practical, thereby minimising any associated impact on the "human" environment. The mitigation measures that relate to the human environment, and sensitive receptors in particular, mainly involve water, air, noise and vibration, landscape and traffic.

The applicant, Lagan, has established an environmental monitoring programme for the quarry site. The programme allows for on-going monitoring of environmental emissions (e.g., noise, dust, blasting, water) from the site, thereby assisting in ensuring compliance with requirements or regulations. Future environmental monitoring programmes for the site will be submitted to Laois Co. Co. for their approval prior to the recommencement of quarry activities

The development will be controlled and regularised in accordance with the scheme as outlined in this document, through continued environmental monitoring and by planning conditions imposed by the competent authority. The proposal will have no major and/or long-term effect on the human environment.

It is the policy of the operator to ensure the health and welfare of its employees by maintaining a safe, clean and tidy working environment, and employing safe working procedures that accord with the requirements of employment legislation, regulations, and best work practices.

Access to the site has and will be restricted at all times, and all visitors and contractors will undergo a site induction before entering the site. The wearing of protective clothing such as footwear, helmets and high visibility clothing will be mandatory in operational areas. Careful attention will be paid to safe practices when carrying out machinery maintenance and ensuring appropriate guarding of moving parts.

Adequate fencing, signage and other barriers have been erected around the existing pit site for the safety of the general public and to prevent livestock straying into the development. Large lockable gates are in place to guard against unauthorised and unsupervised entry to the site outside of working hours.

5 BIODIVERSITY

This chapter provides an assessment of the impacts of the proposed development in question on the ecological environment, i.e., flora and fauna. The subject site is located at Spink Quarry, Knockbaun, Spink, Co Laois. The lands in which the proposed development is located have no formal designations.

The nearest European sites to the Proposed Development are associated with the River Nore and includes the River Barrow and River Nore SAC (Site Code 002162) and the River Nore SPA (004233), which are located 1.04 km and 8.51 km, respectively from the proposed development.

There are currently two active surface water outfalls from the site, one to the eastern catchment and one to the western catchment. These correspond with the mapped surface water divide that runs north-south through the centre of the site. This division separates the River Clogh catchment to the east and the River Owenbeg to the west. Both eventually lead to the River Nore with its associated European sites: the River Barrow and River Nore SAC (Site Code 002162) and the River Nore SPA (004233).

The quarry habitats were identified as worked quarry areas and scrub and grassland mosaic areas are identified as 'Rough pasture' and 'Scrubland'. There are no rare or protected habitats recorded in the study area. The buildings were surveyed for bats and there were no signs or records. The night-time detector survey of the site recorded two species of bats: Leisler's bats along with Common pipistrelles. There were no signs or records of badgers. While no signs of otters were recorded within the site, potential impacts on otters are considered under indirect impacts on water quality downstream.

There will be no significant change to the quarry habitats from the continued working of the quarry. The quarry base and surrounding upper levels comprise areas of bedrock and have been prepared for quarrying with no predicted significant effects on footprint habitats. The predicted direct effect on footprint habitats is neutral, imperceptible and permanent.

The surrounding Scrub/Grassland mosaic will continue to be managed as part of the quarry operation with similar levels of grazing and maintenance of tracks and access areas. The predicted direct effect on surrounding habitats is neutral, imperceptible and long term.

None of the qualifying habitats or species of the European sites occur under the footprint of the proposed works areas.

Unspecified species of lamprey have been recorded from the lower reaches of the River Dinin (to which the River Clogh discharges, c. 6 km directly southeast from the site) and there are records of all three lamprey species for the Nore. It is unknown as to whether or not lampreys occur in local watercourses in close proximity to the site but brook lamprey is thought likely to occur.

The distribution of white-clawed crayfish from the upper River Nore catchment is confirmed in the literature and the NPWS have records of White clayed crayfish in the River Owenbeg and River Dinin downstream.

Important populations of the freshwater pearl mussel and the Nore freshwater pearl mussel occur in the River Barrow and River Nore SAC. The River Nore is the only site in the world for the hard water form of the Pearl Mussel.

Atlantic Salmon and Trout are present in the River Nore and Atlantic Salmon are a Qualifying interest of the River Barrow and River Nore SAC along with Twite Shad. The freshwater stretches of the River Nore main channel is a designated salmonid river.

Freshwater Pearl Mussels FWPM and their associated links with Salmonids as life cycle hosts, may be affected by pollution events such as elevated suspended solids and/or chemical pollution.

Screening for Appropriate Assessment found that the potential for significant adverse effects on the River Barrow and River Nore SAC (Site Code 002162) and the River Nore SPA (004233) is uncertain in the absence of control of potential pollution of discharge water during operation.

The proposed development will require a Water Management Plan to avoid potential impacts on the receiving environment of the Owenbeg and Clogh Rivers and the River Nore downstream.

The project NIS reviewed the predicted impacts arising from the project and found that with the implementation of appropriate mitigation measures specifically with regard to surface water, significant effects on the integrity of the River Barrow and River Nore SAC and the River Nore SPA can be ruled out.

The majority of developments granted permission in the vicinity of the proposed development area have been screened for predicted impacts on European sites and granted permission. Given the avoidance measures proposed, the proposed development will have no predicted impacts on European sites, therefore cumulative impacts can be ruled out.

There are no predicted adverse effects on local or downstream biodiversity, flora or fauna as a result of the proposed development given the inclusion of workable industry standard mitigation measures that will be monitored to ensure continued efficacy.

6 LAND, SOILS & GEOLOGY

The potential impacts of the proposed continuance of quarry operations at Spink Quarry, Knockbaun, Spink, Co. Laois, on the geological environment is assessed and possible mitigation measures proposed to reduce any significant impacts. Quarry workings have been a feature of this site since before the 1970's.

The desk study was undertaken to compile, review and interpret available information, data and literature pertaining principally to the geological and soil environment of the site, its immediate environs and regional setting.

The field survey consisted of a site walkover on 17th February 2021 and 31st June 2021 to assess the geology of the site and record all significant geological features. The exposed sandstone/siltstone deposits in the quarry were examined during the site walkover and are described below. Aspects of the desk-based assessment were verified, and geological descriptions and photographs of the geological features were recorded. The site walkover included a visual examination of the quarry faces as part of this geological assessment.

The dominant soil occurring in the wider area around the Spink Quarry is Surface Water Gleys and Ground Water Gleys (AminPD), which are derived from mainly non-calcareous parent material. There are several large patches of AminSW (Lithosols and Regosols), which are derived from mainly non-calcareous parent material, and cover most of the site at Knockbaun, with a minor tract of mostly Gleys. Ribbons of Alluvmin (Mineral Alluvium) developed along river courses, and small pockets of AminSP (Peaty Podzols) also occur in the area.

SLR Consulting Ireland (SLR) were requested by Lagan Materials Ltd. (Lagan) to undertake a preliminary geological resource assessment of Spink Quarry and the lands immediately to the southeast of the current extraction area during February 2020. The assessment comprised a desktop review of previous exploration works, site inspection, rotary core drilling, petrographic analysis and chemical and physical testing.

The sequence exposed in the quarry comprises the underlying Moyadd Coal Formation exposed at the toe of the back face in the northwest, and the overlying Coolbaun Formation exposed at the crest of the face in the southeast. The quarry has been developed almost entirely within the intervening Clay Gall Sandstone and consequently the entire sequence of the formation is exposed in the various quarry faces. These reveal a massive thick uniform sandstone at the base of the formation with more variable interbedded sandstone and siltstone unit towards the top. The aggregate quality assessment carried out by SLR (Refer to Appendix 6) indicates that the sandstones of the Clay Gall Sandstone Formation are strong to very strong and are likely to be of high quality.

The Coolbaun Formation (siltstones and mudstones with occasional sandstones) will likely be used more as a general fill material and/or for use in the manufacture of cement at Lagan's cement works at Killaskillen, Kinnegad, Co. Meath.

A search of the GSI Geological Heritage Database indicates that there are no sites of geological heritage within the site of the quarry and only three sites within c. 5 km of the site. An audit of the Geological Heritage of County Laois was carried out in 2016, which identified 33 County Geological Sites (CGS) in the county. In its 2017-2023 County Development Plan

(CPD), the Council recognizes these areas of conservation value, which include a number of geological and geomorphological sites.

In respect of Land, Soils and Geology, the land, soils and geological heritage in the area potentially represent sensitive receptors. No additional land take is envisaged as part of the proposed development, and thus no further lands will be directly impacted. The soils on-site have been stripped to gain access to the underlying sandstone/siltstones and have been used for perimeter screening berms or placed in long-term storage for subsequent use in restoration. Soil stripping was carried out in accordance with the principles of good soil handling. The storage areas and restoration areas have been vegetated to reduce both visual impact and erosion.

If the development did not proceed, the aggregate resource would remain unused in situ, and the local supply of quality aggregates and concrete products would be more restricted. The site would be restored to beneficial after-use as per the requirements of the existing planning permission (P.A. Ref. 10/383). However, the resources of the quarry would remain in situ and thus unutilised, and would possibly result in the requirement to develop a more remote greenfield site.

The development will have no indirect impact on the local or regional geology, as no contaminants will be released onto the lands, and dust emissions will be tightly controlled.

There are no nearby mineral extraction or industrial developments, such that it is unlikely that the current development will lead to significant adverse impacts in combination with other developments—the nearest being the Lagan Clay Products Facility at Swan. Thus, no negative cumulative impacts on the geological environment were identified.

Given the location (c. 135 km from the border with N. Ireland), nature, size and scale of the proposed development, it is expected that the impacts of the development will not have any significant transboundary impacts on land, soils or geology.

As a result of the proposed mitigation and enhancement measures incorporated in the design, no significant, long-term, adverse residual impacts are predicted in terms of Land, Soils and Geology during the operational phase, although the potential for exposing features of geoheritage interest represents a potential positive impact.

The final land restoration scheme will ultimately allow the site to be returned to a condition whereby there will be negligible residual impact on the surrounding environment due to the extraction and removal of the sandstone/siltstone bedrock underlying the site. It is planned to minimise, eliminate or decrease long-term ecological and visual impacts on the environment through the implementation of the landscaping & restoration scheme.

It is considered that the exact detail with respect to final treatment of quarry should be left to at least 6 months prior to final restoration to facilitate future beneficial end use. A typical planning condition to this effect could be "The developer shall confirm in writing with the planning authority within 6 months of the cessation of operations, the details of, and programme for, implementation of the restoration scheme upon permanent cessation of quarrying activity at the site".

7 WATER

This section of the EIAR assesses the impact on the hydrological and hydrogeological environment of the proposed continuation and extension of hard rock quarrying at an existing quarry at Knockbaun, Spink, Co. Laois.

In the course of this assessment, we have considered and integrated information relating to the region, local area and site, as follows:

- Desk study;
- Site walkover and local area visual survey;
- Site investigations including piezometer installations with continuous water level data loggers, drilling of large diameter wells for aquifer pumping tests, groundwater and surface water quality sampling for hydrochemical evaluations, groundwater and surface water level recording, flow measurements and cross-sectional survey of receiving survey waters; and
- Data analysis including quantification of aquifer characteristics to inform potential future dewatering requirements, establishment of groundwater and surface water level and flow regimes, design specifications for effective mitigation measures, e.g., settlement pond system, determination of hydraulic capacity of receiving waters, determination of chemical status of receiving waters and ability to assimilate discharge waters.

Three large diameter 'Production Wells' were drilled between 18th – 22nd February 2021 for the purposes of a hydraulic evaluation. This evaluation was designed so as to establish true groundwater gradients, facilitate the application of a conventional pump tests and evaluate potential for impact on local domestic wells. The hydrogeological information gathered from the conventional well drilling and testing was used to calculate likely future water management volumes arising at the site. The large diameter boreholes were drilled to a target depth of 5 m, approximately, below the proposed deepest part of the site's final floor level, which is proposed to be 200 m OD and 190 m OD in the north-western and south-eastern zones, respectively, following the dip of the Clay Gull Sandstone formation.

Constructed settlement ponds are present in the northwestern and southwestern corners of the site. No extraction is proposed in this area of the quarry and the settlement ponds are to be recommissioned. The existing quarry sump occurs in the central portion of the site.

Rainfall landing in the catchment upgradient of this area drains by gravity to the sump. Rainfall landing in the western half of the quarry drains by gravity either to the sump or towards the northwestern corner of the site, which accommodates the historic water management infrastructure.

It is understood that during previous operations, water was pumped initially from the sump to a series of four interconnected settlement ponds in the southwestern corner of the site (referred to as the 'Western Settlement Ponds'). These ponds remain in-situ and are usable for the management of the quarry's waters in the future. All settlement system ponds at the site are lined with concrete and are impermeable (Refer to Figure 3.1).

The site straddles a mapped surface water catchment boundary that separates lands that drain naturally to the Owenbeg River to the west and the Clogh River to the east. The lands between

the site and these watercourses are drained by a network of agricultural field drains and first order streams. The drainage routes connecting the site to both of these rivers was assessed for their potential suitability to safely receive and transmit natural catchment flows plus an additional quarry discharge.

With respect to protecting the river systems to the east of the site, the proposed quarry design makes provision for a 50 m buffer zone set back from the boundary road. There will be no quarrying and no construction activity in this area. The rising of the Clogh River is in this zone and is thereby protected.

Hydraulic modelling of the surface water system (Refer to EIAR Section 7), based on cross sections and surveying, has demonstrated that the local area's surface water network can accommodate the predicted dewatering amounts, in combination with flood flows and allowances for climate change. The western route is more suitable for safely transmitting the predicted quarry discharge.

With respect to surface water monitoring, the surface waters comply with High Status Environmental Quality Objectives of the Surface Water Regulations (2009 as amended 2012, 2015, 2019).

In line with standard practice, discharge surface water should be limited to the pre-quarrying discharge rate in order to mitigate against downstream flooding. As quarrying progresses, a sump with a minimum available volume of 15,650 m³ will be maintained—this could take the form of 75 m by 75 m and an unsaturated depth of 3 m, or equivalent.

Waters will be pumped from the sump to the settlement pond system. The existing settlement ponds have been recommissioned and are now ready to remove particulate matter from waters prior to discharge from site. Additional clarification will be provided in the final ponds prior to discharge. The existing settlement pond systems are deemed to be adequate.

Quarry water currently leaves the northwestern half of the quarry by gravity *via* an open ditch that extends northwest from the final clarification pond through the roadside embankment. This ditch has become silted up over time, such that waters now flow along a very narrow channel on the southern side of the R430 before entering a gully. This gully is located 120 m northwest of the final pond outfall. In the course of pre-planning consultation with Laois County Council, the latter requested that adequate measures are enacted so as to ensure that stormwater or discharge leaving the quarry does not contribute to road runoff in the area. This can be easily achieved following clear out of Laois County Council's under-road culvert in that area. The current connection between the final outfall pond and the aforementioned gully chamber shall be upgraded by way of a maintained open channel and subsurface pipe connection to the gully manhole.

The discharge to surface water will be subject to a licence to discharge to surface water as required under Section 4 of the Local Government (Water Pollution) Act, 1977.

The quarry floor and its sump settlement system are to be adequately sized to handle the water volumes they are expected to receive. Discharge has been calculated to intercept the equivalent of < 0.1 % of the regional groundwater flow volume. Water management and discharge have been designed with cognisance of the enacted Irish Regulations concerning Groundwater, Surface Water, Birds, Habitats and Pearl Mussels. There will be no significant

net loss or gain in the GWB system because the volume intercepted and managed at the site represents, by calculated water balance, < 0.1 % of the regional groundwater flow volume. Hydraulic response testing of the bedrock suggests that the radial effect will not impact local wells. Washdown water from the concrete batching plant shall be recycled through a dedicated closed water recycling system adjoining the batching plant.

A holding tank will be provided for wastewater management of foul water effluent. This holding tank will be routinely cleaned out by a licenced waste contractor.

With respect to an on-site supply, the site has three new production wells that can supply the site with potable water. Water quality results suggest that groundwater is of suitable quality for use at the site. Should planning be successfully obtained, it is proposed to convert PW3 to a Production Well (Refer to Figure 3.1 for location). Headworks shall be sealed with a concrete pad. An appropriate water treatment facility, including ultraviolet filter, shall be fitted to ensure water complies with the requirements of the Drinking Water Regulations (2014) prior to supply to staff at the site.

Laois County Council Planning Authority, Viewing Purposes Only

8 CLIMATE

This section of the EIAR addresses the issues related to climate for the proposed development at Spink Quarry, Knockbaun, Spink, Co. Laois, and its impact on the climate of the application site and its environs as a result of the activities being undertaken. It involves an assessment of the prevailing climatic conditions and assesses the potential impact of the development on the latter.

There is no guidance on the general climate other than, in respect of EIARs, the EPA's 2015 Draft Advice Notes for Preparing an Environmental Impact Statement.

The study of climate in respect of the proposed development was entirely a desktop study, involving the compilation and analysis of data and information on weather, climate, climate change, and impact of, and vulnerability to, climate change.

The closest synoptic station where the average potential evapotranspiration (PE) is recorded is at Kilkenny c. 27 km to the south of the site. The 30-year annual average rainfall (AAR) recorded at Kilkenny 27 km south of the site is given as 857.4 mm/yr. Met Éireann's long-term average PE for this station is 533 mm/yr. This value is used as a best estimate of the site PE. Actual Evaporation (AE) at the site is estimated as 506 mm/yr (which is 0.95 x PE). The effective rainfall (ER) represents the water available for runoff and groundwater recharge. The ER for the site is calculated as the AAR – AE (i.e., 857.4 – 533), which gives a value of 324.4 mm/year.

The average daily air temperatures at Kilkenny (1978-2007) range from 5.9°C to 13.8°C, with a mean 9.9°C. These values can be considered comparable to those expected at the application site.

The prevailing winds in this area are from the southwest and west as illustrated by the wind rose for the synoptic weather station at Mullingar (Kilkenny and Birr are unavailable) c. 70 km north of the site. Notably, there was a low percent calm value of 3.1%.

There is a low risk of pluvial flooding (i.e., rainfall ponding) at the site as rainfall landing in the quarry that is collected as surface water run-off will be managed through the settlement pond system prior to discharge to an external watercourse.

Climate change adaptation will be integrated into the proposed development based on its vulnerability and should ensure adequate resilience to the adverse impacts of climate change. It has been calculated that the stormwater generated during a 1 in 100 year event of 18 hours duration is 16,752 m³. As the applicant intends to limit the discharge rate from the sump to the ponds to a maximum of 1,453 m³/d, this gives an extreme rainfall event storage requirement of 15,650 m³ over the same 18 hour duration. The quarry will be capable of withholding any stormwater generated during extreme rainfall events and runoff in excess of 1,453 m³/d.

If the proposed development is not granted planning permission, local demand for road aggregate may require materials to be transported from further afield, with a consequential impact in terms of increased vehicular exhaust emissions. It is considered that failure to

continue the quarry will nonetheless have an imperceptible negative impact with respect to climate.

The scale of the operation under planning permission P.A. Ref. 10/383 was up to a maximum output of 350,000 tonnes per annum. The proposed development will not exceed this level and the average output will be closer to c. 200,000 tonnes per annum. This is not of a sufficient scale to have any significant direct impacts on the regional or local climatic conditions.

GHG emissions from plant and machinery at the Spink Quarry will represent of the order of 0.001 % of Ireland's national carbon budget, which is a medium- to long-term, imperceptible impact in terms of Ireland's contribution to climate change.

The absence of large scale commercial and industrial developments within 3 km of the quarry negates any significant cumulative impact on the climate or climate change.

As a result of the proposed mitigation and enhancement measures incorporated in the design, no significant, long-term, adverse residual impacts are predicted in terms of Climate during the operational phase. Furthermore, it is considered that following full restoration and closure of the site, there will be a slight to imperceptible positive impact with respect to Climate due to restoration of the lands to a wildlife amenity.

As the development is not expected to affect the local climate or microclimate of the area, there is no requirement for mitigation or monitoring within this development proposal in respect of climatic issues. Therefore, there are no mitigations proposed specifically with regard to the climate. The proposed development will ultimately lead to the restoration of the quarry lands to a wildlife amenity, which will generate no further emissions from fossil fuels or dust, further lessening any impact on the climate.

The applicant, Lagan Materials Ltd. (Lagan), have implemented an Energy and Carbon Policy (Refer to EIAR Appendix 5), which has been developed by Breedon Group plc, Lagan's parent company. This policy commits to operating in a manner that ultimately eliminates its contribution to global warming by mitigation of climate change impacts through industrial innovation and the application of industry best practice.

9 AIR QUALITY

This section of the EIAR deals with the issue of air quality associated with the proposed development at Spink Quarry, Knockbaun, Spink, Co. Laois.

The baseline study comprised a desktop review of:

- Relevant policy, legislation and guidance with respect to air quality and emissions;
- Existing dust monitoring results were analysed to evaluate the current air quality conditions; and
- Impact of the development on the existing air quality of the area.

Baseline dust monitoring was carried out at the site using a Bergerhoff dust deposition gauge. The method of measurement is the German Standard VDI 2119 specified in the "Technical Instructions on Air Quality Control – TA Luft) 1986.

If the development is not permitted, local demand for road aggregate may require materials to be transported from further afield, with a consequential impact in terms of increased vehicular exhaust emissions.

This is an established well developed quarry and as such the working face has already been developed/exposed within the central portion of the site. The mobile crushing and screening plant will be located centrally within the existing excavation, relocating periodically as the working face is developed to the southeast.

As an existing quarry with much of its infrastructure in-situ, only a brief construction phase is envisaged. It is considered that any direct impact with respect to emissions to air will be slight, short term, negative due to construction works.

The impacts of any dust deposition from the quarry operations will be direct, of short duration, temporary and largely confined to the site area. Various mitigation measures will be implemented to minimise any impacts as much as practical to ensure the operation of the quarry will not result in any significant impact on residences or local amenities.

Dust monitoring will be carried out in accordance with the within the recognised TA Luft dust deposition limit value of 350 mg/m² per day. Despite the low level of activity, the quarry is proposing a very robust mitigation regime, which is fully compliant with best practice in Ireland including the Department of the Environment, Heritage and Local Government publication from 2004 "Quarries and Ancillary Activities – Guidelines for Planning Authorities".

Given that the façade of the nearest residences is approximately 260 m from the nearest active quarry area, relevant guidance would indicate that there is no potential for soiling when the scale of construction is defined as moderate. No significant impacts are expected when the mitigation measures are taken into account. In relation to PM₁₀, which is the particulate fraction with the potential harmful health effects and vegetation effects, the nearest façades fall outside of the distance for potential significant effects.

Apart from the direct impact of the deposition of particulate material, there may be an associated slight visual impact with fugitive dust generation. This impact will be minimised by

the mitigation measures directed at minimising dust emissions and those directed at minimising visual impacts.

There are no other quarries, commercial or industrial facilities in close proximity to the site. As such, it is considered there will be no significant cumulative impact with respect to the operation of the quarry.

Given the location (c. 135 km from the border with N. Ireland), nature, size and scale of the proposed development, it is expected that the impacts of the development would have imperceptible transboundary impacts on air quality.

Given the low inherent potential for dust and dispersion from the proposed development, the remote rural location, and the mitigation measures incorporated in the design, it is anticipated that the impact on the existing air quality during the operational phase will be negligible, such that no residual impacts are predicted.

The worst case impact would be generation of dust from crushing and screening of aggregates and from HGV traffic on internal haul roads in the absence of dust suppression resulting in a moderate impact on the immediate surrounds.

Various mitigation measures will be implemented to minimise any impacts as much as practical to ensure the operation of the quarry will not result in any significant impact on residences or local amenities. Thus, a number of mitigation measures will be put in place in order to promote fugitive dust reduction and ensure that the operation is within any specified thresholds, and in line with good industry practice.

The existing dust monitoring programme will allow on-going monitoring of fugitive dust emissions from the site, thereby assisting in ensuring compliance with the accepted TA Luft dust deposition limit value to be adopted at site boundaries associated with quarry developments – total dust deposition (soluble and insoluble): 350 mg/m²/day (when averaged over a 30-day period). This limit is in accordance with condition No. 6 of planning permission (P.A. Ref. 10/383) for the existing quarry development.

This condition is also in accordance with guidance issued by both the Department of the Environment and the EPA in relation to dust deposition monitoring for these types of developments and will continue to be applied.

Lagan Materials Ltd have in place a group wide Environmental Management System (EMS). The EMP for the quarry includes for regular dust monitoring to demonstrate that the development is not having an adverse impact on the surrounding environment. The locations of the proposed dust monitoring stations are shown in Figure 3.1.

This programme will allow on-going monitoring of fugitive dust emissions from the site thereby assisting in ensuring compliance with any future requirements or regulations. The results of this monitoring will be made available to the Local Authority on a regular basis, where members of the public may examine it.

10 NOISE & VIBRATION

This section of the EIAR deals with the issue of noise and blast vibration associated with the proposed development at Spink Quarry, Knockbaun, Spink, Co. Laois.

The baseline study included a desktop review of relevant policy, legislation, planning guidelines and technical guidance with respect to noise emissions. The review of the guidance enabled identification of appropriate noise criteria for the proposed development, and prediction of the levels of noise & vibration emissions at the noise sensitive locations in the vicinity of the site.

JSPE conducted an attended noise survey of the site on 1st June 2021. In order to assess the impact of the proposed quarry extraction operations on residences in the locality a noise prediction exercise was undertaken, whereby the levels of noise at the nearest noise sensitive receptors were calculated. A computer-based prediction model has been prepared to quantify the noise levels of the proposed development. This section discusses the methodology behind the noise modelling process and presents the results of the modelling exercise.

The worse-case scenario suggests 'None' or 'Low' adverse impact is likely at the residents including the closest to the development. This location is also close to the road and some of the existing measured ambient noise levels here already exceed the predicted levels from the development.

The impact assessment and its context are such that the development is highly unlikely to result in an adverse effect. With that in mind, we see no reason from a noise impact perspective for this development not to proceed.

On average 20,000 to 30,000 tonnes of rock will be produced per blast. Blasting will occur on site approximately once per month. Blasting will be carried out using industry standard bench blasting techniques. A consequence of blasting is ground vibration measured as peak particle velocity (i.e., PPV) and air overpressure measured as the noise level of "air blast" (i.e., dB (Lin)). Blast monitoring will be carried out at agreed residences within the area. Ground vibration and air overpressure will be measured for each blast.

Lagan will put in place a "Blast Notification Procedure & Blast Monitoring Programme". A copy of the proposed procedure is provided in EIAR Appendix 11. This procedure will be amended as necessary on any grant of planning permission for the quarry development.

There are no indirect impacts with respect to noise. There are no other quarries, commercial or industrial facilities in close proximity to the site, such that it is considered there is no significant cumulative impact with respect to the operation of the quarry. Given the location (c. 135 km from the border with N. Ireland), nature, size and scale of the proposed development, it is expected that the development would have no transboundary impacts.

As a result of the proposed mitigation and enhancement measures incorporated in the design, no significant, adverse residual impacts are predicted in terms of noise and vibration levels on the local residences, their property, livestock or amenity during the operational phase. Noise monitoring will ensure that the operations comply with recognised thresholds for this type of development.

The noise prediction modelling data show that the development can comply with the noise level threshold as specified and as a consequence the development will have no significant effects regards noise levels in the area.

Lagan Materials Ltd have in place a group wide Environmental Management System (EMS). A copy of the existing EMP for Spink Quarry is included as EIAR Appendix 10. The EMP for the quarry includes for regular noise monitoring to demonstrate that the development is not having an adverse impact on the surrounding environment.

The developer shall carry out blast monitoring (ground-borne vibration and air overpressure) for each blast. The monitoring locations shall be agreed in advance with the Planning Authority and shall be established prior to commencement of development. The following information shall be recorded for each blast: date; time; location in the quarry; amount of explosive used; maximum instantaneous charge; vibration and air overpressure monitoring results. The results of the monitoring shall be submitted to the Planning Authority four weeks after the end of the quarter being reported on.

This programme will allow on-going monitoring of noise and blast vibration emissions from the site, thereby assisting in ensuring compliance with any future requirements or regulations.

Through implementation of the proposed mitigation measures, it is considered the development will continue to have no significant effects with regard to noise and blast vibration levels on the local residences, their property, livestock and amenity.

Laois County Council Planning Authority (Review Purposes Only)

11 LANDSCAPE

This section of the EIAR addresses the landscape and visual impacts with respect to an accompanying planning application for the proposed development of Spink Quarry at Knockbaun, Spink, Co. Laois. The landscape and visual baseline study comprised a desktop study with follow-up field survey in the vicinity of the site. Although closely linked, landscape and visual impacts are assessed separately.

The desk study was used to determine the nature of the visual amenity of the area along with the approximate visibility of the development, which was determined through topographic analysis of map data. Potential receptors of visual effects, including residents and visitors through the area were also identified.

Ordnance Survey Ireland (OSi) Discovery Series 1:50,000 and OSi 1:5,000 raster mapping and aerial photography were examined. A topographical survey of the existing site was also carried out and modeled using digital terrain modeling software through which cross sections were produced. LSS Digital Terrain Modelling software has been used to undertake ZTV (Zones of Theoretical Visibility analysis).

Site visits were undertaken on 17th February 2021 and 1st June 2021. The purpose of the site visits was to enable familiarisation with the site, establish the general landscape character of the area and identify principal representative viewpoints including residences, prospects, public pathways and roads with views of the site. The actual extent of visibility was also checked in the field due to the localised screening effects of buildings, walls, fences, trees, hedgerows and banks. Potential seasonal screening effects were also identified where necessary and recorded.

The visual survey also includes and is supported by a photographic record from the principal and other relevant viewpoints. The photographs were taken at eye level at the point of interest towards the development area using a digital camera.

Principal viewpoints were mapped, and these views illustrated by photographs with annotations to describe any important characteristics, and the changes that have arisen as a result of the development.

The results of the visual field survey have shown that due to intervening topography, screening, and vegetation, views towards the quarry site are generally limited to restricted mid-distance views from elevated ground and residences to the north.

There are no indirect impacts associated with the proposed development and the surrounding areas. There are no other significant developments within c. 3.0 km of the site at Spink. The absence of any extractive or industrial developments within c. 3 km renders the likelihood of significant negative cumulative landscape impacts highly improbable. Given the location (c. 135 km from the border with N. Ireland), nature, size and scale of the proposed development, it is expected that the impacts of the development would have no significant transboundary effects on landscape, given the local or at most regional nature of landscapes.

As a result of the proposed mitigation and enhancement measures incorporated in the design, no significant, adverse residual impacts are predicted in terms of Landscape during the operational phase.

It is considered that following full restoration and closure of the site that there will also be no significant, long-term, adverse impacts in terms of Landscape. The restored quarry will provide a more sustainable, long-term environment than is currently the case, but with a change in land-use from the original agricultural use to mineral extraction to ultimately a future beneficial use as a wildlife amenity.

It is expected that in the absence of mitigation measures that there would be slight to moderate negative effects with respect to local amenity and residential receptors as a result of the development of Spink Quarry.

Consideration has been given to screening using preservation of existing vegetation, favourable direction of working, provision of screening berms as necessary, progressive restoration of upper quarry face, and the final restoration of the quarry site once operations at the site cease.

Consideration will be given to preserving most of the bank and scrub vegetation along the Regional R430 and lands to the south of the currently permitted quarry area (P.A. Ref. 10/383), so as to visually screen future development of the quarry within Phase 2. This will ensure that the upper back face is restored at the earliest opportunity, that the working face is not open to view, and that as the quarry pushes eastwards only the restored upper face will be revealed as quarrying progresses to the limit of extraction.

The proposed development will also enable the operator to fully complete the restoration of the both the existing and proposed quarry to a secure wildlife habitat, which is at the moment in a semi-derelict state.

A working scheme has been designed for the quarry which provides for the sequence and direction of working. The objective of this scheme is to reduce as far as possible the overall visual impact of the workings. The quarry will also be worked in a favourable direction (west to east) so that site operations will be on the quarry floor being screened from outside views. The existing, bank, hedgerow, scrub and trees shall be preserved along the boundary with the Regional Road, and as such the view from the above vantages will be largely preserved. Plans and Sections of the design and associated restoration are shown on Figures 3.1 to 3.3.

Grading and planting on completed sections of the upper quarry face will be carried out. The upper benches will be seeded with suitable species of shrubs and climbers to create vegetated ledges. Seeding with shrubs and climbers and natural colonisation on these faces will encourage growth on the faces and will subsequently break up the inherent harshness of the exposed rock face.

12 CULTURAL HERITAGE

Dr. Charles Mount was commissioned by J Sheils Planning & Environmental Ltd. on behalf of Lagan Materials Ltd. to prepare an assessment that addresses the impacts of the proposed development on the archaeological, architectural and cultural heritage of the application site and surrounding area at Knockbaun, Spink, Co. Laois. The assessment represents the cultural heritage and archaeological component of the Environmental Impact Assessment Report (EIAR) pertaining to the proposed development of Spink Quarry. The assessment consisted of a desktop and fieldwork study, which was carried out in April - May 2021.

The study involved detailed investigation of the archaeological and historical background of the development site, the landholding and the surrounding area extending 1 km from the development boundary. This area was examined using information from the Record of Monuments and Places of County Laois, the Laois County Development Plan, lists of excavations and cartographic and documentary sources.

Examination of the Record of Monuments and Places for County Laois indicated that there are no Recorded Monuments located within the application area (see EIAR Appendix 12). Examination of the Sites and Monuments Record (SMR) indicated that there are no SMR sites in the application area or the study area.

The Ordnance Survey 1st and 3rd edition six-inch maps and the first edition 25-inch maps of the area were examined. The analysis did not indicate any previously unrecorded archaeological or cultural heritage sites in the application area or vicinity.

The excavations bulletin at excavations.ie, which is supported by the Department of Housing, Local Government and Heritage, was examined to identify any licensed archaeological investigations carried out in the application area or the study area. The analysis indicated that there have been no licensed archaeological investigations carried out in the application area or the study area.

No sites of archaeological importance, National Monuments, or protected structures listed in the Laois Development Plan are located within the proposed development area. Examination of the Ordnance Survey 1995, 2000 and 2005 imagery as well as Google Earth imagery from 2005, 2009, 2010, and 2018, and 2020, Bing imagery from 2011, and Apple Maps imagery from 2017 did not indicate any additional archaeological or cultural heritage sites in the application area.

A field inspection was carried out on the 5th of May 2021 to determine the location, extent and ascertain the significance of any archaeological sites and to identify any previously unrecorded or suspected sites and portable finds.

The southeasternmost section of the land holding (c. 4.7 ha), remains as undisturbed scrub and poor grazing land and will remain in place to form a natural screening barrier from views to the east and northeast. There is no indication of any cultural heritage material.

There will be no direct or indirect impacts on any known items of archaeology, cultural heritage or buildings of heritage or special architectural interest in the application area or the vicinity.

There will be no cumulative impacts on the archaeological, architectural or cultural heritage resource. As a result of the proposed mitigation and enhancement measures incorporated in the design, no significant, adverse residual impacts on the archaeological, architectural or cultural heritage resource are predicted during the operational phase.

There are no items of cultural heritage, archaeological sites or monuments or buildings of heritage or special architectural interest known from the application area or vicinity. There will be no direct or indirect impacts on any known items of archaeology, cultural heritage or buildings of heritage or special architectural interest in the application area.

Laois County Council Planning Authority, Viewing Purposes Only

13 MATERIAL ASSETS

This section of the EIAR provides an overview of the material and amenity resources within the vicinity of the proposed development at Spink Quarry, Knockbaun, Spink, Co. Laois, coupled with an assessment of the potential impact, if any, of the development on the existing environment in respect of these assets.

Material assets may be defined as resources that are valued and that are intrinsic to specific places, and may be either of human or natural origin, and the value may arise from either economic or cultural reasons.

Based on the nature of the proposed development, the material assets that could potentially be impacted by the quarry, and which were identified for assessment are: (1) non-renewable resources (minerals, soils); (2) settlement - residential development; (3) land use; (4) transport infrastructure; (5) built services; (6) waste management infrastructure (7) cultural assets - archaeological, historic and architectural heritage; and (8) landscape and natural heritage.

The study involved a virtual, but comprehensive, aerial examination of the study area and surrounding region using Google Maps and available OSI maps to identify the material assets. All assets identified during this survey were interrogated, described, and evaluated in terms of scale and significance prior to inclusion in the study.

The proposed development arises from the continued demand of human beings to have their buildings, roads and structures, modified and improved. The supply of construction materials is therefore essential to material progress of human society and their built environment.

It is considered that following restoration and the mitigation measures incorporated in the design that there will be no significant adverse effects in terms of material assets, other than the loss of the in-situ mineral resources due to extraction, which is an unavoidable outcome of the proposed development. The restoration of the site to beneficial after-use, most probably as a wildlife amenity, will result in a permanent significant positive effect in the long-term.

There are no other significant developments within c. 3 km of the site at Knockbaun. The absence of any extractive or industrial developments within c. 3 km renders the likelihood of significant negative cumulative impacts on the material assets of the area highly improbable.

As a result of the proposed mitigation and enhancement measures incorporated in the design, there will be no significant, adverse residual impacts on the material assets of the area during the operational phase, other than the loss of the mineral resources.

It is considered that following full restoration and closure of the site, there will also be no significant, long-term, adverse impacts in terms of the material assets. The restored quarry will provide a more manageable and sustainable, long-term environment than is currently the case, with a change in land-use to a beneficial after-use as a wildlife amenity.

The applicant has established an environmental monitoring programme for the quarry site. The programme allows for on-going monitoring of environmental emissions (e.g., noise, dust, blasting, water) from the site, thereby assisting in ensuring compliance with requirements or regulations. Future environmental monitoring programmes for the site will be submitted to Laois County Council for their approval prior to the recommencement of quarry activities.

This quarry is located in a rural area of low population density. The boundaries of the quarry are enclosed by a combination of berms, hedgerows and fencing, which is designed to blend into the surrounding landscape. There will be ongoing monitoring to ensure that site boundaries are maintained in a proper manner, and these include thickening of hedgerows, fencing of the landholding, provision and maintenance of quarry signage, routine cleaning/housekeeping and the removal of unsightly features. Appropriate warning signs to the public will be provided on the approaches to the site, and the access gate will be kept padlocked shut outside of the normal working hours.

The development can be controlled and regularised in accordance with the scheme as outlined in this document, through continued environmental monitoring and by conditions imposed by the relevant regulatory authority. The development does not have a significant impact on lands, property, or amenity within the area and hence there will be no significant impacts on material assets, other than again, the loss of the mineral resource.

Laois County Council Planning Authority, Viewing Purposes Only

14 ROADS & TRAFFIC

The proposed development will consist of the continued use and operation of the existing quarry, within the currently permitted area (P.A. Ref. 10/383) including deepening of the quarry and provision of a concrete batching plant in the townland of Knockbaun, Spink, County Laois.

The existing quarry is permitted under planning permission P.A. Ref. 10/383, which allows for a maximum output of 350,000 tonnes per annum. The proposed development will not exceed this level and the average output will be closer to c. 200,000 tonnes per annum.

The impact of the traffic associated with the quarry operations is the subject of this report. The assessment was based three scenarios where the volume of stone quarried at the site varied between 200,000^A, 300,000^B or 350,000^C tonnes per annum.

This report has been prepared by Tony J. McNulty B.E, F.I.E.I. Chartered Engineer. The report assesses the traffic impacts of the proposed development on the road network adjacent to the proposed development at Knockbaun, Spink, County Laois.

The quarry site access is situated off the south side of the R430 Regional road, which joins Abbeyleix to Carlow. This road passes through Swan village and crosses the N78 Athy to Castlecomer road at Newtown Cross. The site is situated 7.5 kms East of Abbeyleix and 4 kms West of Swan village and 8 kms West of R430/N78 junction at Newtown Cross. The R430 Regional road is the main access from Abbeyleix to Carlow.

The traffic assessed is the traffic generated by Spink Quarry, the traffic independent of the quarry and the interaction of both. The traffic section has been prepared taking into account the existing the road networks and traffic patterns in the vicinity of the proposed development. The traffic impact assessment has been prepared taking into account the proposed traffic generated by the proposed development.

The approach undertaken for the assessment includes details of all surveys undertaken, technical references used and assumptions made in the study. Traffic flows on the R430, R430/Quarry Access, R430/N77 and R430/N78 junctions were obtained by surveys carried out on these roads on 21st April 2021.

The traffic growth rates were calculated from PE-PAG-02017 and peak hour % volumes were calculated. Historical traffic flows were obtained from TII automatic traffic counters in the site vicinity. The existing traffic volumes in the area are of medium values on the Regional road network in the vicinity of the proposed development site.

The peak hours were derived using count data and historical data from TII automatic counters adjacent to the general area and it was found that morning and evening peak flows were at 8.00-9.00 hrs and 17.00-18.00 hrs, respectively. The evening peak traffic generated the greatest flows. These figures are used as a base to forecast the volumes on the N77, N78 and R430 and are used to examine the impact of the traffic generated by the quarry on the existing road network and the future traffic volumes.

There has been a continuous increase nationally in traffic since 2015 as economic circumstances have improved throughout Ireland, albeit interrupted in 2020 by the Covid-19 pandemic lockdowns.

Using the information from a number of TII automatic counters in or adjacent to County Laois, the traffic volumes for 2015 to 2019 on the equivalent week in April as the 2021 count were interrogated to give a picture of how traffic volumes are developing within the county. The results show there was a continuing increase in traffic in the County Laois area between 2015 and 2019. However, this was interrupted in 2020 by the Covid-19 pandemic lockdowns and resulted in a drop in traffic. The results shows that the traffic volumes are recovering and should return to the 2019 volumes over a short period when the danger of Covid-19 and lockdowns are eased.

This proposal would increase the total daily volume of traffic on the surrounding networks. The level of traffic associated with the quarry development will be high with vehicles operating only during the stated working hours of Monday to Friday (7.00-18.00 hrs) and (7.00-14.00 hrs) on Saturday, with no work on Sundays or Bank Holidays.

The quarry will export up to 200,000^A, 300,000^B, or 350,000^C tonne per annum of stone and concrete. Based on a 48 week year, 5.5 day week, 11 hour day and 24 tonne average load, this equates to circa 76^A, 108^B or 124^C heavy goods vehicles (HGV) per day or 19^A, 21^B or 23^C HGV trips at peak hour. There will be 6 employees at the proposed quarry and occasional maintenance & delivery vehicles.

The traffic impact of the proposed development will be its impact upon the N77/R430, R430/Quarry Access, N78/R430 Road junctions and the N77. It is anticipated that the quarry traffic will move 70% westwards and 30% eastwards along the R430. Then, in Abbeyleix, it is anticipated the quarry traffic will move 90% northwards and 10% southwards along the N77. At the N78 at Newtown Cross, it is anticipated the quarry traffic will move 30% northwards and 30% southwards along the N78 and 40% eastwards along the R430 towards Carlow.

The peak hour traffic was determined, and shows that the morning peak occurred at 8.00 hr, and the evening peak at 17.00 hrs in all locations. The volume of peak hour traffic in all cases is greater in the evening peak. This volume of evening peak hour traffic was found to be 9.4% of the Average Daily Traffic. The peak hour traffic generated by the quarry development combined with the network peak hour traffic flow is used as the determining factor of the traffic impact of the development.

The evening peak flow to/from the quarry were calculated to be of the order of 5 vehicles inwards and 14 outwards. The peak hour additional quarry site traffic would increase the junction movements by 12%.

The 2021 traffic volumes on the road network in the vicinity of the proposed development will continue to increase. The impact of the proposed quarry site on the Regional and National road networks has been assessed for the Operation and Restoration phases of the proposed development.

There will be an increase in traffic volumes using the existing road networks due to the addition of the quarry development. This increase will consist primarily of HGV's. It will be most pronounced along the R430 from the site entrance to the N77 junction in Abbeyleix and N77 National road north of Abbeyleix.

The volume of traffic generated by the proposed Quarry site at Spink will result in an increase in a daily vehicle flow of 124, i.e., an increase of 6.2%. It has been shown that this increase can be readily absorbed by the adjacent road networks.

The final restoration of the development will continue as material is exported from the site and will require the use of earth moving machinery for completion. This machinery will be available on site and as such there no additional traffic associated with mobilising onto and off the site.

The development of the quarry site will cause increased traffic movements in the Regional and National roads in the area. A number of mitigation measures, such as appropriate roadside signage, will be put in place to reduce the impacts of the increased traffic movements.

Laois County Council Planning Authority, Viewing Purposes Only

15 INTERACTIONS

The interactions of the impacts and mitigation measures between one topic and another, where applicable, are discussed under the respective environmental factor in EIAR sections 4 to 14, rather than in EIAR Section 15 Interactions. This section draws attention to significant interactions and interdependencies in the existing environment, but the actual interactions and their significance are dealt with in the relevant chapter.

The general practice is to include a matrix to show where interactions between effects on different environmental factors have been addressed. This is usually done using the actual headings used in the EIAR for each factor. The following matrix has been generated to show where possible interactions (top of matrix) may result between the various environmental factors including brief details (bottom of matrix). For details of any interactions refer to the relevant sections of the EIAR.

Laois County Council Planning Authority, Viewing Purposes Only

Table 15 Interactions Matrix

Con	Construction Phase	Op	Operational Phase	x	No Interaction	● Weak Interaction ● Some Interaction ● Strong Interaction																
Factors (Interaction)	4 Population & Human Health		5 Biodiversity		6 Land, Soils & Geology		7 Water		8 Climate		9 Air Quality		10 Noise & Vibration		11 Landscape		12 Cultural Heritage		13 Material Assets		14 Traffic	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
4 Population & Human Health			●	●	●	●	X	●	X	X	●	●	●	●	●	●	X	X	X	●	X	●
5 Biodiversity	The Peregrine Falcon recorded nesting on the cliff face of the SW area of the site will not be affected by the proposed development. Sand Martins are seasonal colonisers of the face of a stockpile. Potential indirect impacts on the nesting area can be avoided by timing of works specific to the area identified.				●	●	X	●	X	X	●	●	●	●	●	●	X	X	X	X	X	X
6 Land, Soils & Geology	Moderate, long-term, negative impact due to removal of resources. Significant, long-term, positive impact if fresh exposures due to excavation are of geological/ scientific interest and of high to very high importance.		There will be no significant change to the quarry habitats from the proposed development. The predicted direct effect on footprint habitats is neutral, imperceptible and permanent.				X	●	X	X	X	X	X	X	●	●	X	X	X	●	X	X
7 Water	No potential for drawdown nor potential for impact on local wells is predicted.		Surface water catchment is ~1%, of c. 1000 km ² surface water catchment of the closest downstream pearl mussel population at Ballyragget. No impact is possible at this ratio, distance and the magnitude of the land mass in between the site and the pearl mussel receptor.						X	●	X	X	X	X	X	X	X	X	X	●	X	X
8 Climate	X		X		X						X	X	X	X	X	X	X	X	X	X	X	X
9 Air Quality	The impacts of dust from the operations will be direct, of short duration, temporary and largely confined to the site area. Mitigation measures will be implemented to minimise any impacts as much as practical to ensure the operation of the quarry will not result in any significant impact on residences or local amenities.		There will be imperceptible impact with respect to local amenity and sensitive receptors as a result of dust and fumes derived from the development.		X		X		X				X		X		X		X		X	
10 Noise & Vibration	The worse-case scenario suggests 'None' or 'Low' adverse impact is likely at the residents including the closest to the development (NSL2). Residences along R430 are typically experiencing noise levels of 50 dBLAeq during daytime hours due to passing traffic.		The Peregrine Falcon recorded nesting on the cliff face of the SW area of the site will not be affected by the proposed development. Sand Martins are seasonal colonisers of the face of a stockpile. Potential indirect impacts on the nesting area can be avoided by timing of works specific to the area identified.		X		X		X						X		X		X		●	
11 Landscape	It is expected that in the absence of mitigation measures that there will be slight to moderate negative effects with respect to local amenity and residential receptors as a result of the development of Spink Quarry. Consideration has been given to screening using preservation of existing vegetation, favourable direction of working, provision of screening berms as necessary, progressive restoration of upper quarry face and the final restoration of the quarry site once operations at the site cease		Moderate, long-term, negative impact due to removal of resources. Significant, long-term, positive impact if fresh exposures due to excavation are of geological/ scientific interest and of high to very high importance.				X		X				X				X		X		●	
12 Cultural Heritage	X		X		X		X		X				X						X		X	
13 Material Assets	Moderate, long-term, negative impact due to removal of mineral resources. Significant, long-term, positive impact if fresh exposures due to excavation are of geological/ scientific interest and of high to very high importance		X		Moderate, long-term, negative impact due to removal of resources. Significant, long-term, positive impact if fresh exposures due to excavation are of geological/ scientific interest and of high to very high importance.		No potential for drawdown nor potential for impact on local wells is predicted.		X		X		Noise and vibration emanating from the quarry due to operating machinery and intermittent blasting will be controlled to within . accepted noise and vibration thresholds.		Consideration has been given to screening using preservation of existing vegetation, favourable direction of working, progressive restoration of upper quarry face.		X				X	
14 Traffic	The traffic impact of the quarry site on the R430 road and on the R430/Quarry Access will result in an increase of traffic on the network, but it is considered capable of being absorbed within the existing traffic.		X		X		X		X		There will be imperceptible impact with respect to local amenity and sensitive receptors as a result of dust and fumes. Trucks entering and leaving the site with dusty materials shall be covered and they shall pass through a wheel wash before exiting.		The worse-case scenario suggests 'None' or 'Low' adverse impact is likely at the residents Residences along R430 are typically experiencing noise levels of 50 dBLAeq during daytime hours due to passing traffic.		X		X		The Worst-Case Impact of the development could be the deterioration of the pavement along the R430 due to HGV traffic. This may require maintenance works during the life of the development.			

16 FIGURES

Laois County Council Planning Authority, Viewing Purposes Only



Legend

- Application Area (c. 19.6 ha)
- L7800 Local Roads

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NOTES:

1. All Dimensions in metres (m)
2. Elevation Levels - metres Above Ordnance Datum (mAOD)
3. Extract from 1:50,000 OSI Discovery Series Map No. 60 & 61



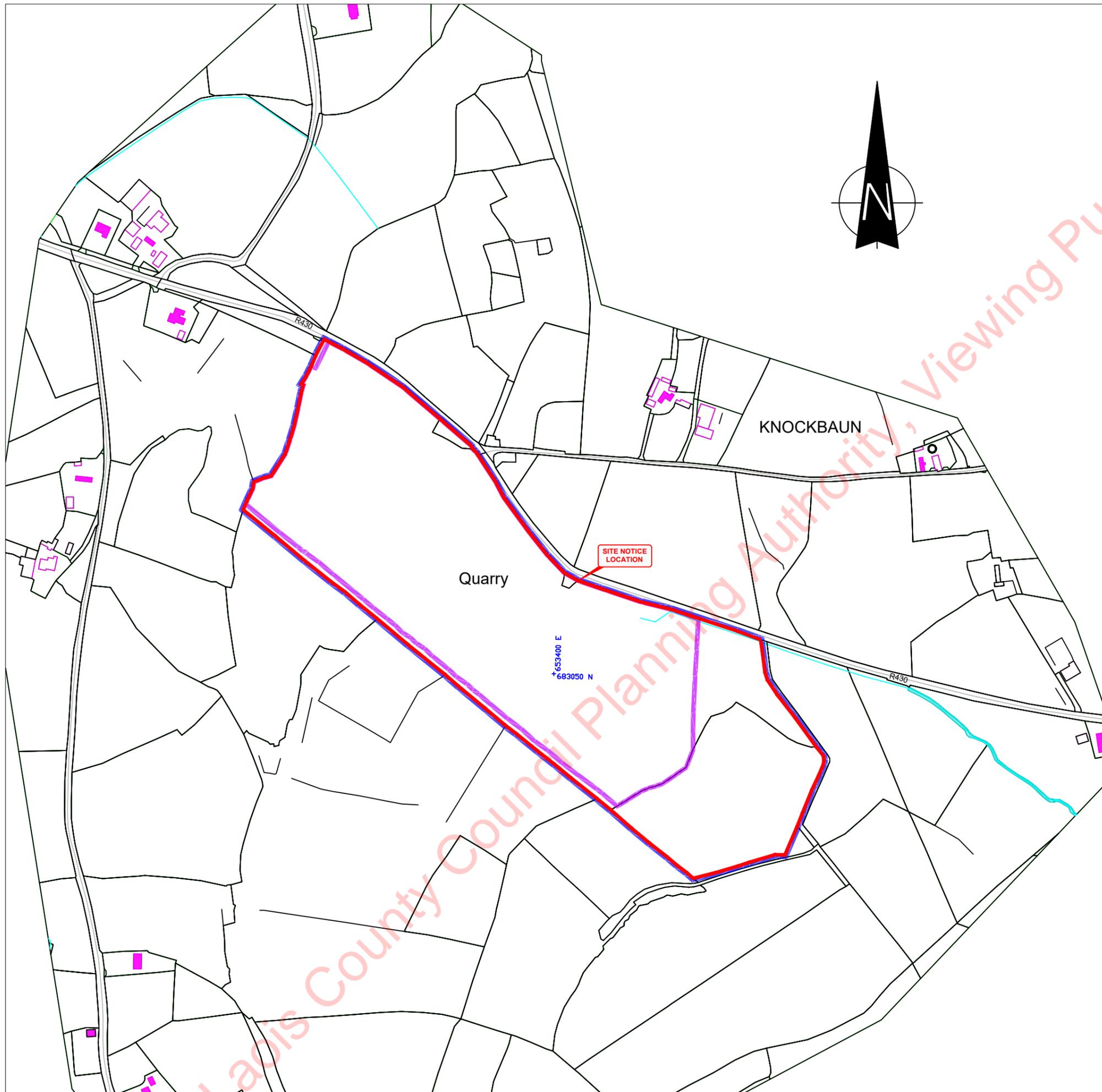
JSPE

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J SHEILS PLANNING & ENVIRONMENTAL LTD

CLIENT	Lagan Materials Ltd
DRAWING	Site Location Map
LOCATION	Knockbaun, Spink Co. Laois

Drawn by	John Sheils	Scale	1:50,000
Checked by	John Sheils	Job No.	JSPE 280
Date	03/02/2021	Figure No.	1.1
		Rev.	00



Legend

- ▬ Application Area (c. 19.6ha)
- ▬ Planning Permission (P.A.Ref. 10/383)
Extraction Area (c. 14.5 ha)
- ▬ Landholding (c. 19.6 ha)
- +
- Irish Transverse Mercator (ITM)
geographic coordinates
- ▨ Residence

Description:
=====

Digital Cartographic Model (DCM)
=====

Publisher / Source:
=====

Ordnance Survey Ireland (OSi)
=====

Projection= IREN95_Irish_Transverse_Mercator
=====

Centre Point Coordinates:
=====

X,Y= 653298.007049,683091.199631
Reference Index:
=====

Map Series | Map Sheets
1:5,000 | 4236
Data Extraction Date:
=====

Date= 03-Feb-2021

- NOTES:**
1. All Dimensions in metres (m)
 2. Elevation Levels - metres Above Ordnance Datum (mAOD)
 3. For Planning Purposes Only. Do not scale for setting out.

Scale 1:5,000



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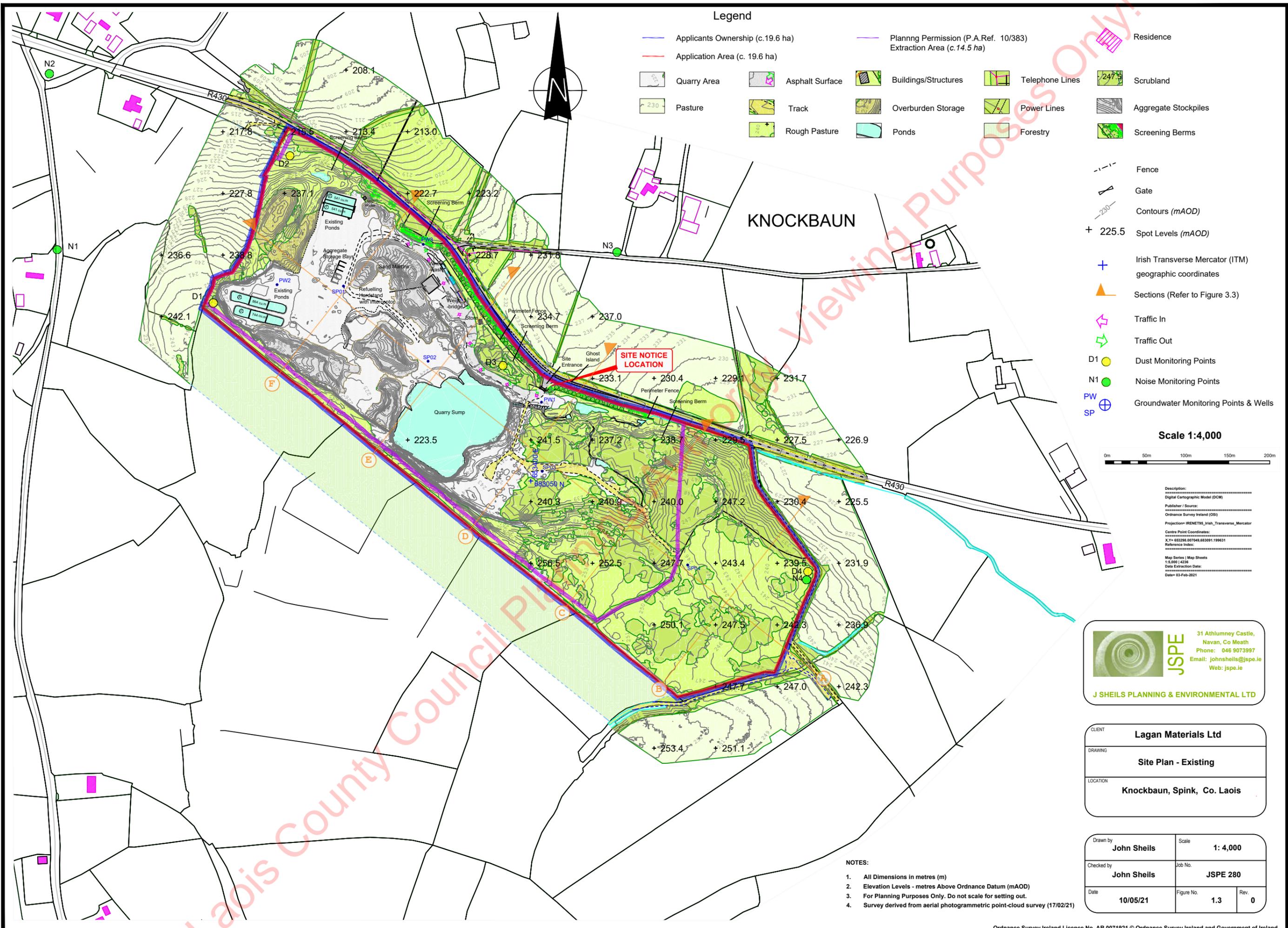
CLIENT	Lagan Materials Ltd
DRAWING	Application Area Map
LOCATION	Knockbaun, Spink Co. Laois

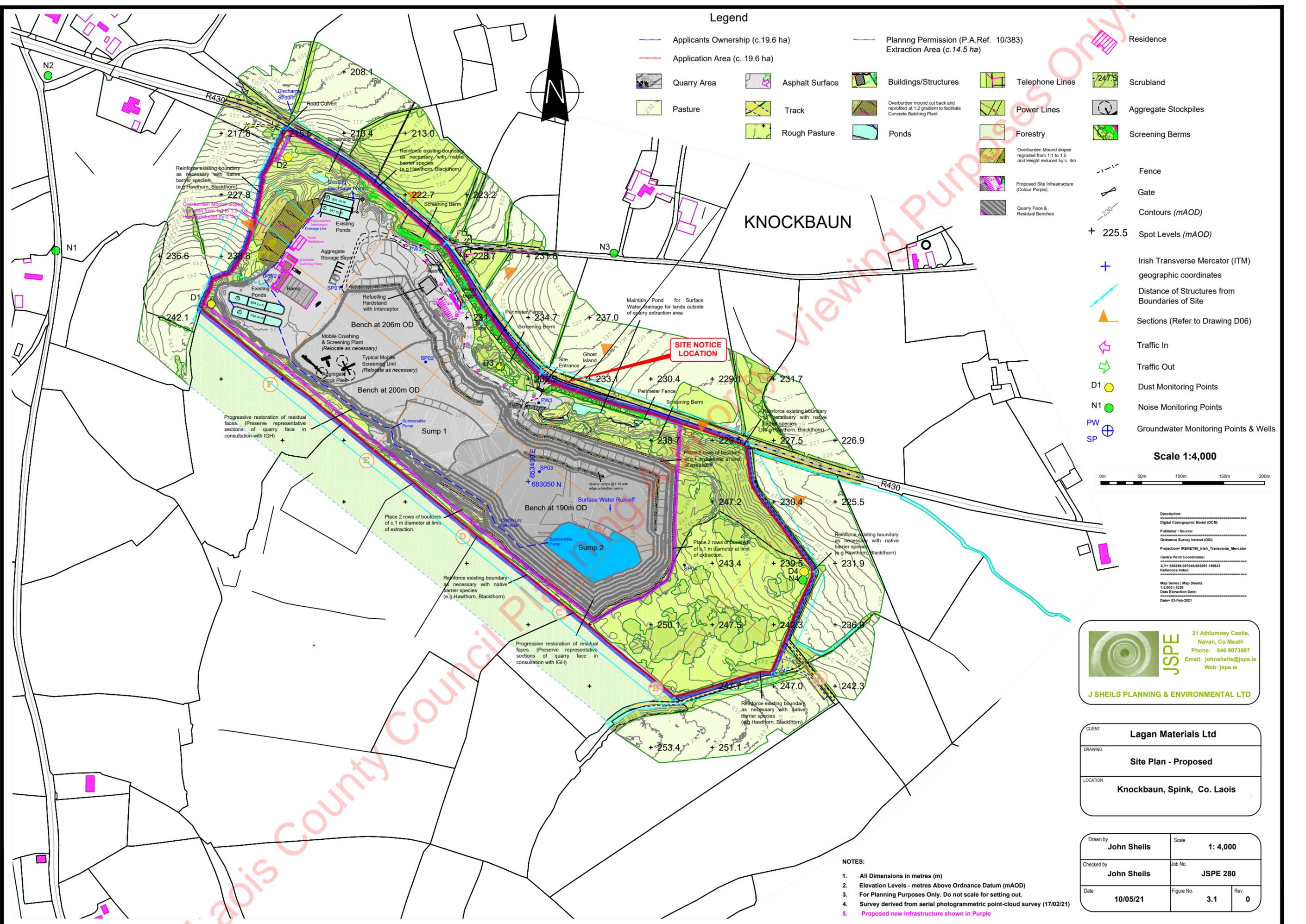


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J SHEILS PLANNING & ENVIRONMENTAL LTD

Drawn by John Sheils	Scale 1:5,000
Checked by John Sheils	Job No. JSPE 280
Date 03/02/2021	Figure No. 1.2 Rev. 00





Legend

- Applicants Ownership (c.19.6 ha)
- Application Area (c. 19.6 ha)
- Quarry Area
- Pasture
- Asphalt Surface
- Track
- Rough Pasture
- Buildings/Structures
- Overburden mound cut back and reprofiled at 1:2 gradient to facilitate Concrete Batching Plant
- Ponds
- Telephone Lines
- Power Lines
- Forestry
- Overburden Mound slopes regraded from 1:1 to 1:5 and Height reduced by c. 4m
- Proposed Site Infrastructure (Colour Purple)
- Quarry Face & Residual Benches
- Residence
- Scrubland
- Aggregate Stockpiles
- Screening Berms
- Fence
- Gate
- Contours (mAOD)
- Spot Levels (mAOD)
- Irish Transverse Mercator (ITM) geographic coordinates
- Distance of Structures from Boundaries of Site
- Sections (Refer to Drawing D06)
- Traffic In
- Traffic Out
- Dust Monitoring Points
- Noise Monitoring Points
- Groundwater Monitoring Points & Wells

Scale 1:4,000

Description:
 Digital Cartographic Model (DCM)
Publisher / Source:
 Ordnance Survey Ireland (OSI)
Projection: IRENET95_Irish_Transverse_Mercator
Centre Point Coordinates:
 X: 683286.907648, 683091.199831
Reference Index:
 Map Series / Map Sheets
 13,000 / 4236
Data Extraction Date:
 Date: 03-Feb-2021

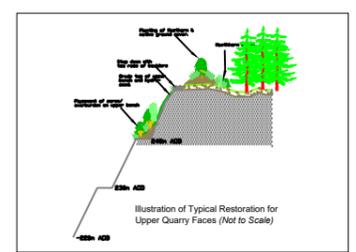
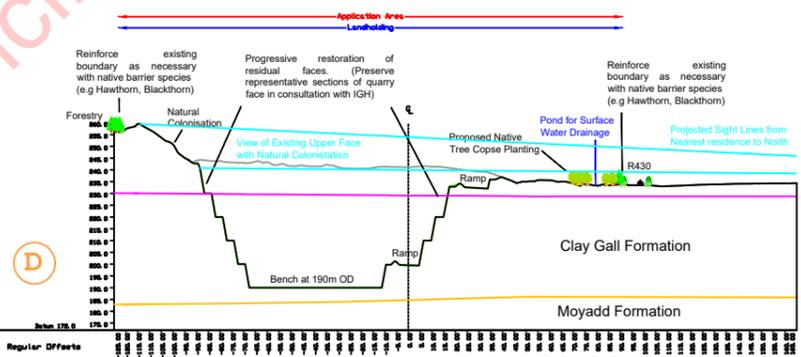
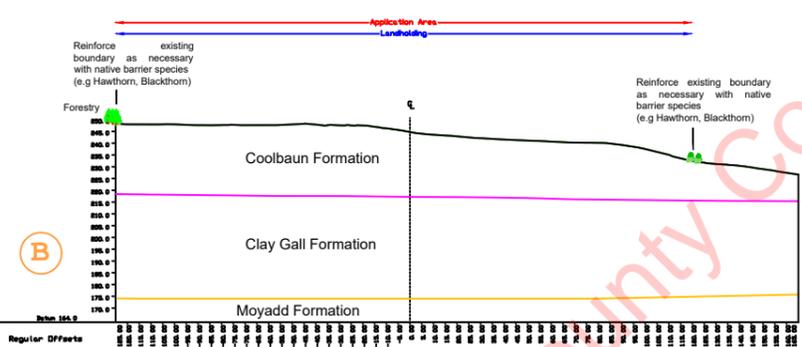
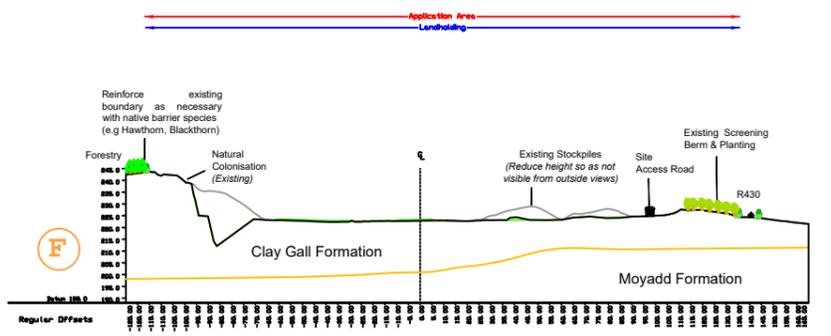
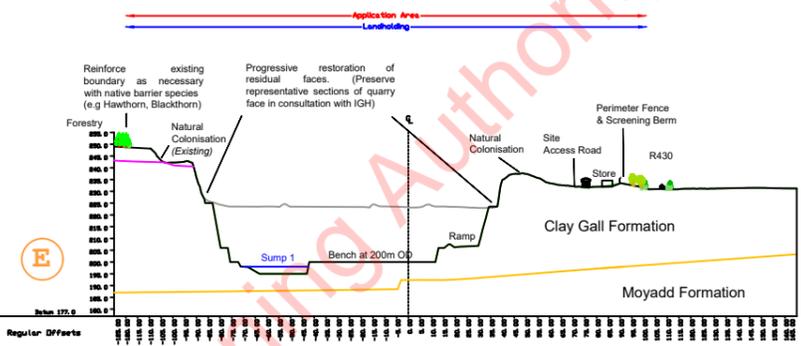
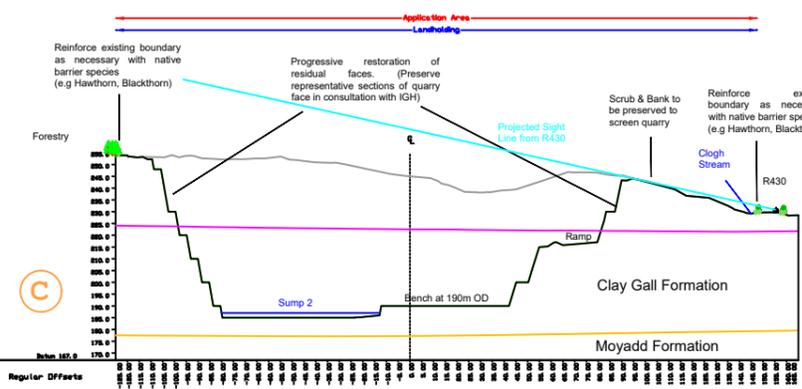
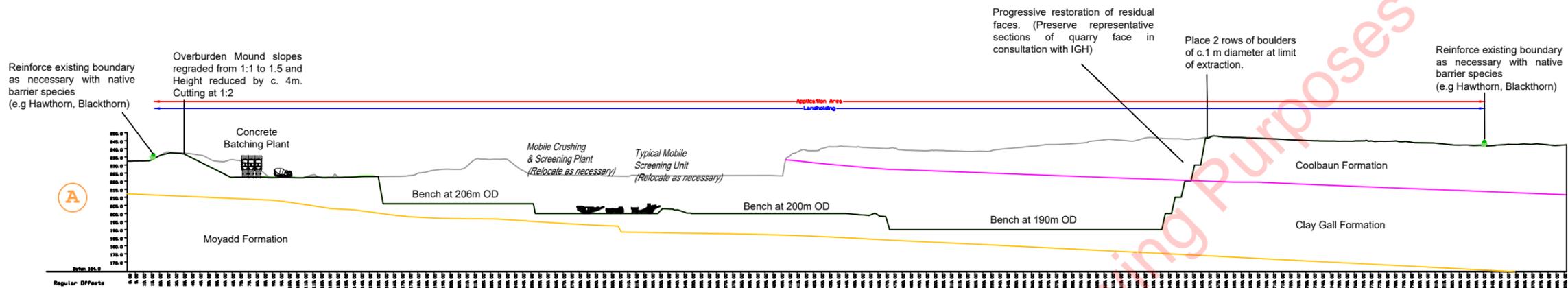
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J SHEILS PLANNING & ENVIRONMENTAL LTD

CLIENT	Lagan Materials Ltd
DRAWING	Site Plan - Proposed
LOCATION	Knockbaun, Spink, Co. Laois

Drawn by	John Sheils	Scale	1: 4,000
Checked by	John Sheils	Job No.	JSPE 280
Date	10/05/21	Figure No.	3.1
		Rev.	0

- NOTES:**
- All Dimensions in metres (m)
 - Elevation Levels - metres Above Ordnance Datum (mAOD)
 - For Planning Purposes Only. Do not scale for setting out.
 - Survey derived from aerial photogrammetric point-cloud survey (17/02/21)
 - Proposed new Infrastructure shown in Purple



- NOTES:**
1. All Dimensions in metres (m)
 2. Elevation Levels - metres Above Ordnance Datum (mAOD)
 3. For Planning Purposes Only. Do not scale for setting out.
 4. Survey derived from aerial photogrammetric point-cloud survey (1/10/2021)
 5. Cross Sections B to E - Centre Line (CL) offset distance from Cross Section A. (Refer to Drawings 003 to 005)

Legend

- Existing Ground Profile (mAOD)
- Extraction Profile (mAOD)
- Final Restoration Profile (mAOD)
- Top of Clay Gall Formation
- Base of Clay Gall Formation

Scale 1:3000



CLIENT	Lagan Materials Ltd
DRAWING	Cross Sections
LOCATION	Knockbaun, Spink, Co. Laois

Drawn by	John Sheils	Scale	1: 3000
Checked by	John Sheils	Job No.	JSP E 280
Date	10/05/21	Figure No.	3.3
		Rev.	0

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