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INTRODUCTION

Background

6.1 This chapter of the Environmental Impact Assessment Report (EIAR) provides a description of the existing land, soils and geological setting at the regional and local scale, an assessment of the impact of the proposed development on the land, soils and geological features of the area around the proposed site at Naul and also other geological aspects of the proposed development.

6.2 Planning is being sought for the development of a sand and gravel pit at Naul townland, County Meath. The proposed development will consist of:

- Extraction and processing on site, to include washing (with associated closed recycled washing plant and lagoon system), screening and crushing plant; storage; stockpiling and haulage of sand and gravel to service the existing readymix concrete plant operated by Kilsaran on the eastern side of the R108 regional road and permitted under P. Ref. 80/572 & 22/153 (ABP-314881-22);
- The total extraction proposal extends to an area of c. 6.2 hectares and will be worked (extracted and restored) on a phased basis for a period of 11 years plus 1 year to complete final restoration works (total duration of 12 years);
- Phased stripping and storage of topsoil and overburden materials for reuse in the restoration works. Restoration of the site will be to a beneficial agricultural after-use;
- Access to the site will be through the existing agricultural enterprise site entrance onto the R108 regional road with upgrade of same to consist of setting-back of the existing boundary wall to the north of the site access, and provision for the upgrade of the existing internal access track and sections of a new access track which will include a new weighbridge; and
- All associated site ancillary works within an overall application area of c. 14.9 hectares.

6.3 The existing permitted concrete batching facility (P. Ref. 80/572 & P. Ref. 22/153 (ABP-314881-22) to the east side of the R108 regional road does not fall within the red line planning application area. For the purposes of preparing a robust EIA assessment, the concrete batching plant is cumulatively assessed with the proposed extraction development where relevant.

Scope of Work / EIA Scoping

6.4 This EIAR chapter is based on a desk study of the site / surrounding lands using published geological data, site photographs, groundwater borehole logs and site visits previously carried out by SLR.

Consultations / Consultees

6.5 In preparing the previous planning application (P. Ref. AA191263), a pre-planning consultation meeting was held between officials of Meath County Council and the applicant on the 2nd August 2019 at the offices of the Planning Authority. As the site is adjacent to the Meath-Dublin border, pre-planning consultation was also carried out with Fingal County Council at the time.

6.6 Although this planning application is for development broadly covering the same development as applied for previously under P. Ref. AA191263, owing to the lapse in time between planning applications, a further formal pre-planning meeting was held with Meath County Council Planning Department via Teams on the 30th May 2024.

6.7 A number of sources of information were consulted in the preparation of this EIAR Chapter for Land, Soils and Geology. The sources of information consulted are outlined below.

Authors

6.8 This EIAR chapter relating to Land, Soils and Geology was prepared by:

- Nikolina Bozinovic BSc, MSc; and
- Peter Glanville BA, MSc, EurGeol PGeo.

REGULATORY BACKGROUND

EU Directives

6.9 The following European Union (EU) Directives relate to Land, Soils and Geology at the proposed development site in this EIAR:

- Environmental Impact Assessment Directive (2014/52/EU); and
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. 296 of 2018).

6.10 This chapter of the EIAR has been undertaken in accordance with the EU EIA Directive which regulates the environmental impact assessment process and information to be contained in EIARs.

Guidelines

6.11 This Land, Soils and Geology EIAR chapter has been prepared in compliance with the following guidelines:

- Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. May 2022;
- European Commission, Environmental Impact Assessment of Projects - Guidance on the preparation of the environmental impact assessment report (Directive 2011/92/EU as amended by 2014/52/EU), Publications Office, 2017;
- Department of Environment, Heritage and Local Government, 2004. Quarries and Ancillary Activities, Guidelines for Planning Authorities;
- Environmental Protection Agency, 2006. Environmental Management in the Extractive Industry: Non-Scheduled Minerals;
- Geological Survey of Ireland - Irish Concrete Federation, 2008. Geological Heritage Guidelines for the Extractive Industry;
- Institute of Geologists of Ireland (2013) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements;
- Geological Survey of Ireland, Irish Concrete Federation (2008) Geological Heritage Guidelines for the Extractive Industry;
- National Roads Authority (2008) Environmental Impact Assessment of National Road Schemes - A Practical Guide;

- National Roads Authority (2008) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;
- Good Practice Guide for Handling of Soils (UK Ministry of Agriculture, Fisheries and Food, 2000); and
- Transport Infrastructure Ireland (March 2013). Specification for Road Works Series 600 – Earthworks.

Planning Policy and Development Control

6.12 The following Planning Policy and Development Control relating to Land, Soils and Geology at the site is set out in the:

- Meath County Development Plan 2021-2027.

6.13 The county development plan sets out conservation objectives in relation to natural heritage and landscape, including geology, in the county, including.

- **Objective HER POL 46**: To maintain the geological and geomorphological heritage values of County Geological Sites listed in Table 8.7 and, through consultation with the Geological Survey of Ireland, protect them from inappropriate development.
- **Objective DM POL 22**: To encourage the rehabilitation of disused pits and quarries to productive agricultural use where appropriate having regard to all appropriate environmental considerations.
- **Objective DM OBJ 63**: Where possible, sites shall be subject to rehabilitation and landscaping programmes in tandem with the various phases of extraction. Possible uses post closure could include agriculture and recreation/amenities.

RECEIVING ENVIRONMENT

Study Area

6.14 For the purposes of this assessment, the study area comprises the application site and the surrounding area up to 2 km reflect the sensitivity of the Land, Soil and Geology; this is in line with the Institute of Geologists of Ireland's (IGI) guidelines (2013).

6.15 The IGI guidelines state that the minimum distance of 2 km should be reviewed in the context of the geological environment as well as the scale of development and increased to reflect the sensitivity of the subsurface. The IGI guidelines also state that maps should be sourced to allow for the review of the geological conditions that exist within a minimum of 2 km of the site boundary (from the outer limit of the planning and/or licence area) and presented at a scale of 1:25,000.

6.16 The baseline maps produced in this EIAR chapter are at a scale of 1:25,000, including a more detailed map of groundwater wells at the scale of 1:10,000. These maps are capturing a span of the surrounding area from 500m up to c. 3.5 km from the lands under the control of the applicant.

Baseline Study Methodology

6.17 The baseline study undertaken for Land, Soils and Geology, here involves a review of published literature and information, borehole information and the findings from a walkover survey of the site and the context of the site within the surrounding area.

6.18 This section describes the receiving environment at and in the immediate vicinity of the site using the available baseline information gathered, specifically the:

- **Context** of the receiving environment - location/ magnitude/ spatial extent and trends of the environmental factors;
- **Character** of the receiving environment - distinguishing aspects of the environment being considered here;
- **Significance** of the receiving environment - the quality, value or designation is assigned to the existing environment; and
- **Sensitivity** of the receiving environment - how sensitive is the aspect of the environment to change.

6.19 The baseline study is a qualitative assessment of the available information based on professional experience and interpretation of the available data.

Sources of Information

6.20 A former EIAR for the site from 2019 was examined along with the following sources of information which were consulted in the preparation of the receiving environment baseline study for Land, Soils and Geology.

- Geological Survey of Ireland (www.gsi.ie);
- Teagasc soil and subsoil mapping for Irish Forestry Soils Project (www.epa.ie);
- Irish Soils Information System (www.teagasc.ie/soils);
- Environmental Protection Agency (https://gis.epa.ie/EPAMaps)
- Irish Geological Heritage Programme (www.gsi.ie); and
- Tailte Éireann - Surveying (www.osi.ie).

Detailed Site Investigations

6.21 Five boreholes were drilled at the site in March 2019. The site investigations revealed the nature of the subsoils and the thickness of the granular deposits. The subsoils were noted to comprise of glacial till material as well as sand and gravel. The thickness of the sand and gravel varies across the site from 2.8m at BH1 in the southeast to 19.75m in BH2 towards the centre of the site (see **Table 6-1** below).

6.22 Additional trial pits were completed along the proposed access track in October 2024. Trial pit logs and a trial pit location map are attached in EIAR Chapter 7 **Appendix 7-I**. Infiltration tests were also completed in each of the trial pits and the results of those tests are included on each of the trial pit logs.

Land Baseline

6.23 Within the EIA EU Directive (2014/52/EU) Land is recognised as a 'natural resource' and the Directive also refers to the importance of the sustainable use of soil and the need to address the unsustainable increase in settlement areas over time ('land take'). Therefore, the issues of land as both a natural resource and land take must be considered in an assessment.

6.24 The introduction section to the EU Directive (2014/52/EU) notes that the:

'final document of the United Nations Conference on Sustainable Development held in Rio de Janeiro on 20-22 June 2012, which recognises the economic and social significance of good land management, including soil, and the need for urgent action to reverse land degradation. Public and private projects should therefore consider and limit their impact on land, particularly as regards land take, and on soil, including as regards organic matter, erosion, compaction and sealing; appropriate land use plans and policies at national, regional and local level are also relevant in this regard'.

6.25 Land can be considered to be a resource with a beneficial use to society, for example agricultural land use, extractive industry land use or urban residential land use. Unnecessary land take may result in the loss of this resource which has the potential to have adverse social and economic consequences for society. The current land use across the extension area is agricultural which has a beneficial aspect for society through grassland animal grazing.

6.26 Agricultural land use activities may be considered to be tied activities; tied to the resource present at the site while the type/nature of agricultural activity is also related to the suitability of the soils present.

6.27 The extraction of sand and gravel material at the proposed development site is a resource-tied land use activity, as it is dependent on the location and suitability of the sand and gravel material for its intended use, which are considered to be a natural resource.

6.28 The sand & gravel material is a mineral resource (non-scheduled mineral). The sand and gravel material resource at the site has been proven through the inspection and ground investigation surveys within the application lands. This has included sampling and testing of the in-situ sand and gravel material.

6.29 In terms of land take, the proposed development will result in a loss of the in-situ sand and gravel resource at application area. The soils at the proposed application area will be stripped and stored on site during the extraction process, before being replaced following extraction as part of the restoration operations; this will result in a land take for agricultural land use during the operational extraction life at the site.

6.30 Restoration works are proposed to be carried out on phased basis with final restoration stage on the permanent completion of the extraction operations which will include return of overall application site to an agricultural afteruse and for the most part will merge back into the surrounding pastoral landscape.

Corine Land Cover

6.31 The Corine land cover mapping is a standardised inventory of land cover across Europe which is split into 44 different land cover classes. The latest 2018 Corine land cover mapping for Ireland is based on the interpretation of satellite imagery and national in-situ vector data. Land cover is mapped to the standard CORINE classification system and data specifications.

6.32 The Corine land cover mapping (www.epa.ie) reflects land use at the time of survey, in this case the latest available land cover data for Ireland is 2018. The land cover in the application area is classified as arable land (non-irrigated).

6.33 Within the broader area around the site there is a mix of land cover types, see **Figure 6-1**, which includes the following types:

- Pastures;
- Non-Irrigated Arable Land;
- Mineral Extraction;

- Complex Cultivation; and
- Broad leaved forest.

Soils Baseline

6.34 Soil is defined as the top layer of the earth's crust and is formed by mineral particles, organic matter, water, air and living organisms. Soil is an extremely complex, variable and living medium and its characteristics are a function of parent subsoil or bedrock materials, climate, relief and the actions of living organisms over time.

6.35 Soil formation is an extremely slow process and can take thousands of years to evolve; soil can be considered essentially as a non-renewable resource.

6.36 As the interface between the earth, the air and the water, soil performs many vital functions; it supports food and other biomass production (forestry, biofuels etc.) by providing anchorage for vegetation and storing water and nutrients long enough for plants to absorb them. Soil also stores, filters and transforms other substances, including carbon and nitrogen, and has a role supporting habitats serving as a platform for human activity.

National Soils

6.37 The Irish Soil Information System (ISIS) project was undertaken by the EPA and Teagasc, and has gathered together existing information and data from soil survey work in Ireland, which has been augmented it with a new field data, leading to the production of a new national soil map at a scale of 1:250,000 (www.teagasc.ie/soils).

6.38 The ISIS project has identified a number of Soil Associations across Ireland, which are each comprised of a range of soil types (or '*Series*'), each of them different in properties, with different environmental and agronomic responses. For each soil type, the properties have been recorded in a database maintained by Teagasc.

6.39 The soil association at the site is classified as the Elton Soil Association (ISIS Code 1000x); it is described as comprising luvisols with surface-water gleys, on glacial drift containing mixed limestone and siliceous stones, see **Figure 6-2**. The soil combination is considered to be relatively wet (Creamer *et al*, 2018).

6.40 The Elton Soil Association 1000x is defined as fine, loamy drift with limestones. It is moderately draining, and widespread throughout County Meath and the limestone lowlands of central Ireland. Luvisols in this landscape are considered to be particularly suited to grassland, as they tend to retain nutrients and have a good moisture holding capacity (Creamer et al., 2018).

Subsoils Baseline

National Subsoils

6.41 The Quaternary (Subsoil) deposits were deposited during the last 2 million years, and essentially comprise the unconsolidated materials overlying bedrock. The two predominant types of quaternary subsoils in Ireland are glacial till, deposited at the base of ice sheets, and sand & gravel deposits, associated with the melting of the ice sheets and are generally termed "glaciofluvial outwash sands and gravels". Other extensive Quaternary subsoils in Ireland include peat, river alluvium and coastal process deposits. Most Quaternary subsoils in Ireland were deposited after the maximum of the last glaciation, the Midlandian, which occurred approximately 17,000 years ago.

6.42 The subsoils across Ireland have been mapped on a national basis by Teagasc as part of the EPA Soil and Subsoil Mapping Project for the Irish Forestry Soils (IFS) project. The subsoil mapping was undertaken at a national basis using existing Quaternary Geology maps, publications, remote sensing and field mapping and sampling.

6.43 The subsoils within the application area are mostly mapped as Irish Sea Till with minor contribution of gravels derived from sandstone along the river alluvium deposits in south direction, see **Figure 6-3**.

Site Subsoils

6.44 Boreholes conducted at the site indicate that the thickness of the subsoils varies over the site from 2.8 m to 19.75 m, see **Table 6-1** below and includes glacial till material as well as Sand & Gravels. The location of boreholes at the site is indicated on Error! Reference source not found..

Table 6-1:
Occurrence of superficial deposits across the site

BH ID	Ground Level (mOD)	BH Depth (m)	Subsoils	Thickness of Sand and Gravel Deposits (m)
BH1	77.73	20	Loamy drift with limestones/Sand and Gravel	2.8m (11.1mbgl-13.9mbgl)
BH2	92.3	30	Loamy drift with limestones/ Sand and Gravel	19.75m (9.60mbgl-29.35mbgl)
BH3	79.89	16	Loamy drift with limestones/Irish Sea Till	10.60 (5.4mbgl-16mbgl)
BH4	85.25	13.2	Loamy drift with limestones/ Gravels derived from sandstones	6.60m (6.6mbgl-13.2mbgl)
BH5	106.33	11.5	Loamy drift with limestones/Irish Sea Till	Boulder CLAY at full depth of BH5 (11.5m)

Bedrock Geology Baseline

Regional Setting

6.45 Regionally, the proposed site lies on the structurally complex zone where lower Palaeozoic rocks of the north eastern part the country are in faulted contact with the lower Carboniferous rocks of the Dublin Basin, to the southwest. The regional trend of the contact is north-westerly, see **Figure 6-4**, but there are local variations due to the structural complexity of the contact.

6.46 The lower Palaeozoic rocks in the area of the proposed development are clastic sedimentary rocks, with some andesitic layers. The lower Carboniferous rocks are a mixed package of limestones and calcareous shales.

Local Geology

6.47 Geological Survey of Ireland (GSI) 1:100,000 mapping shows the proposed development site at Naul is underlain by the Ordovician Clashford House Formation to the north-northwest, and the Carboniferous Naul Formation to the south-southeast, see **Figure 6-4**.

6.48 Bedrock is buried beneath significant thicknesses of soil, sand and gravel, with limited exposures near the site. GSI historic outcrop data indicates the presence of outcrops on the site, but recent drilling and satellite imagery do not support that.

6.49 The five boreholes drilled in the area were terminated before reaching bedrock, at depths ranging from 11m to 30m.

Structure

6.50 Folding and faulting is encountered in vicinity of the site, with frequent changes in lithological formations. The faulting is noted in various directions.

6.51 Within the application boundary, there is a significant fault running west-southwest to east-northeast through the proposed development site, down-throwing the Naul formation to the south-southeast, see **Figure 6-4**.

Karstification

6.52 Karst landscapes are characterized by the dissolution of carbonic rocks due to the action of water over long periods of time.

6.53 One known karstic feature, registered as a cave (GSI ID: 2925NEK001) is encountered at approximately 150 m south of the southernmost east corner of landholding boundary. The cave is developed in Naul Formation according to GSI database.

6.54 No registered karstic features encountered within the application boundary.

Geological Heritage Baseline

6.55 The Geological Survey of Ireland (GSI) Irish Geological Heritage (IGH) Programme of audited sites was reviewed (www.gsi.ie) to establish if any geological heritage issues were present in relation to the site at Naul.

6.56 Audits of County Geological Sites in Counties Meath and Fingal were completed in 2007, with a revision carried out for County Meath in 2009.

6.57 The closest Geological Heritage site is a quarry which is c. 4 km southeast from the site, the Nags Head Quarry in Fingal. The Nags Head Quarry is designated as County Geological Status by the Geological Survey of Ireland and is listed in Fingal County Development Plan (2023-2029).

6.58 The Nags Head Quarry will not be affected by the proposed development.

6.59 No other sites of geological importance encountered in local surroundings to Naul.

Sensitive Receptors

6.60 In terms of land, soils and geology baseline considered here, the sensitive receptors identified from this baseline are land for agricultural land use and agricultural soils at the site.

IMPACT ASSESSMENT

Evaluation Methodology

6.61 The evaluation of impacts of the proposed development is based on a methodology similar to that outlined in the:

- 'Guidelines for the Assessment of Geology, Hydrology and Hydrogeology for National Road Schemes' published by the National Roads Authority (2009); and
- 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements published by the IGI (2013).

Evaluation of Impacts

6.62 This assessment therefore will focus on the potential impact of the proposed development on land and soils at the site.

6.63 The proposal is for the development with an extraction area of c. 6.2 hectares and ancillary works, which will result in the direct and phased loss of agricultural land across the extraction area.

6.64 On permanent cessation of extraction activity, the site will be restored to agricultural land use, refer to EIAR **Figure 2-4**.

6.65 The status and importance of existing land, soil and geology attributes identified at the application site is assessed in **Table 6-2** below.

Table 6-2
Status and Importance Land, Soil & Geology Attributes

Attribute	Status / Occurrence	Importance
Land	The land at the proposed application area, the extraction area, is currently used for agriculture (arable land non irrigated). The land is moderately drained.	Agricultural land has a value in terms of its ability to support crops and food production and it is considered to be of high importance at the local and regional scale only.
Soils	The soils at the site are moderately draining. The Elton Soil Association has a relatively wide distribution across the county.	The soils are considered to be of moderate importance at a local scale as they are moderately draining. Drainage improvement works may be necessary for these soils, depending on the intended agricultural use.
Subsoils	The subsoils are tills and gravels derived from Carboniferous limestone and are widespread in the county. The subsoils do not have any particular status.	The subsoils at the site are considered to be of moderate importance at a local scale as they facilitate the development of the moderately draining soils.
Geology	The bedrock at the site does not have any designated status.	In terms of the proposed development, the bedrock geology is of moderate economic importance at the local and regional level. It has the potential to be used in the aggregate or cement industry but is buried to significant depths (at least 30m in places).
Geological Heritage	There are no geological heritage sites within 1 km of the proposed development site.	-

6.66 The magnitude of these impacts on the land, soils and geology attributes is assessed in **Table 6-3** below.

Table 6-3
Magnitude of Potential Impacts on Land, Soil and Geology (with No Mitigation)

Attribute	Impact of Proposal on Land, Soil and Geology	Magnitude of Potential Impact (with No Mitigation)
Land	Development of land for the purposes of sand and gravel extraction.	Moderate impact due to temporary loss of the soil resource locally during operations.
Soils	Stripping of soil and storing on site for later reinstatement.	Low impact as soil type is relatively common and soil quality is moderate.
Subsoils	Permanent loss of sand & gravel subsoil material from extraction.	Negative and permanent at the site as the material will be removed during the operation of the proposed development.
Geology	No impact as bedrock will not be extracted at the site.	No impact as bedrock is already significantly buried.
Geological Heritage	No impact.	No impact.

Direct Impacts

6.89 The nature of the development will entail the stripping and storage of soil material and the excavation of the underlying sand and gravel material within the proposed extraction area.

6.90 There will be a direct impact on the overlying soil which will occur during the stripping and placement of soils to expose the underlying sand and gravel material.

6.91 The direct impact on the soils will be medium term during the lifetime of the project as the soils will be reused in restoration. The effect on the soils, without mitigation, will be significant as the structure and nature of the soils could be degraded.

6.92 A direct impact will occur from the removal of the existing in-situ sand and gravel material deposits within the extraction area. This impact will be negative and permanent at the site as the material will be removed during the operation of the sand & gravel pit. However, this localised site specific impact has to be balanced against the strategic national importance of the pit as a long-term secure supply of high quality sand and gravel material products are required in supporting construction and economic development.

6.93 The proposed development will not impact on bedrock geology.

Indirect Impacts

6.94 The development will not have an indirect impact on the geological aspects of the environment outside the footprint of the proposed sand and gravel pit.

6.95 Soils in adjoining lands will not be contaminated as a result of this proposal. The working (extraction and processing) of sand and gravel material at the site will not release any contaminants onto the lands and any dust resulting from the development can be controlled (refer to EIAR Chapter 8 - Air Quality).

6.96 The proposed development will not lead to any indirect impacts on bedrock geology.

Cumulative Impacts

6.97 The EIAR submitted with the previous planning application in 2019 considered the potential for cumulative effects with the following project that had recently been granted permission at the time (February 2019).

6.98 Meath County Council under planning file reference number AA180893 for:

"Development at this site, within part of a sand and gravel pit (P.A. Reg. Ref. QY36, QC 17.QC2085)which is currently under restoration. The development will consist of the recovery of construction and demolition waste using mobile crushing and screening plant to produce secondary aggregates. The existing site office including welfare facilities will be replaced including provision of septic tank and percolation area. The wheelwash will be upgraded and relocated towards the site entrance. The existing palisade fence at the entrance is to be replaced with a stone wall and separate entrance gate provided for access to the site office. A weighbridge, hard standing area with drainage to oil interceptor, semi-mobile crushing and screening plant and other ancillaries will be provided. The total application area including the site infrastructure covers c. 0.8 ha of lands. The development will be subject to the requirements of a waste management licence (Reg. No. W0265 01) which is currently under consideration by the Environmental Protection Agency (EPA)"

6.99 This grant of planning permission was for a period of 10 years and was subject to the issuing of a waste management licence from the EPA along with the processed secondary aggregate material attaining 'end-of-waste' status from the EPA. It was considered in light of the available assessments that the project would not have any significant adverse cumulative effect on land, soils or geology. As the operation is now functional and waste licence has been granted by the EPA, it can be considered that the project is accounted for within the updated baseline assessments undertaken for this EIAR.

6.100 A search of the Meath and Fingal County Council and An Bord Pleanála's online planning search facilities was undertaken to identify any potential cumulative projects that have been or may be granted since the original EIAR was undertaken in 2019.

6.101 Planning permission ABP Ref. 314881 was granted in February 2024 for ancillary development at the applicant's concrete batching plant across (east of) the R108, which included a concrete reclaimer. Although the site does not form part of the application site, the EIAR has cumulatively assessed the activities of it in combination with the proposed extraction.

6.102 An Bord Pleanála is currently considering a Strategic Infrastructure Development application for a 'Circular Economy Campus' and integrated waste management facility at the Hollywood Landfill, c. 3.6km southeast of the application site (ABP Ref. 314964). Given the distance involved and that the project relates to operational changes that have been prompted by changes to EPA licencing procedure it is not anticipated that there will be potential for cumulative effects with the proposed development under consideration in this EIAR. The general arrangements such site operating hours, location, and general operation will remain unchanged, hence the environmental emissions have been considered within the baseline assessments of this EIAR.

6.103 No cumulative impacts, from the above developments, or other sources, have been identified on land, soils or geology associated with the proposed sand and gravel pit development.

Unplanned Events (i.e. Accidents)

6.67 Unplanned events within the application site, such as accidents, have the potential to impact on the land, soils and geology adjoining the site.

6.68 Ground instability, particularly the long-term stability of pit faces, has the potential to impact on adjoining lands. Operations at the site will adhere to the Health and Safety Authority Safe Quarry Guidelines in relation to the Safety Health and Welfare at Work (Quarries) Regulations 2008 and this will limit the potential for unplanned events such as instability of pit faces or instability in adjacent lands.

6.69 With the implementation of the Quarry Regulations 2008, it is considered unlikely that instability of pit faces would result in an impact on the land, soils and geology at the site.

Human Health

6.70 From a land, soils and geology perspective, any potential impacts on human health from the sand and gravel extraction operations at the site would not be via the land use, soils and geology pathways but via other pathways such as air and water, which are addressed in the relevant sections of this EIAR.

Interaction with Other Impacts

6.71 No interactions with other impacts have been identified for the land, soils or geology attributes associated with the proposed development. The interaction between soils / geology and water is addressed in Section 7 Water (Hydrology & Hydrogeology).

'Do-nothing Scenario'

6.72 Under the 'do nothing scenario' the land at the proposed development site will continue to be available for agriculture.

MITIGATION MEASURES

6.73 Mitigation measures are outlined here for the proposed development of the site as a sand and gravel extraction operation.

Construction Stage

Soils

6.74 Soils will be managed on site in line with best practice. A specific Soil Management Plan will be developed for the site for the stripping, storage and reuse of the soils in restoration at the site.

6.75 During the site preparation stage, the topsoil will be stripped off and will be stockpiled on site ready for use in the site restoration. The soils will be stripped and stored in accordance with best practice guidance a set out in The Institute of Quarrying guidelines.

6.76 The soil handling method can affect the quality of the restoration through severe soil deformation (compression and smearing); this is primarily caused through trafficking, the effects of which increase with soil moisture content.

6.77 The scheme will involve soil stripping across the proposed extraction area. The soil stripping and storage operations will be undertaken in such a manner so as to minimise soil compaction.

6.78 In order to limit the effects of erosion and deterioration on the soil, material will not be removed during either periods of prolonged dry weather or excessively wet weather; this is to avoid the higher potential for dust generation during extended periods of dry weather, and conversely the greater potential for soil erosion during extended periods of wet weather.

6.79 Soils stripped will be stored in screening berms adjacent to the proposed extraction area in such a manner that they can be reused in restoration works for the pit.

6.80 Good practice measures will be implemented at the site in order to preserve the structure and integrity of the soils and limit the effects of erosion on the stored soil during excavation and storage.

6.81 Soil stripping is to be undertaken by the excavator standing on the surface of the topsoil and digging the topsoil to its maximum depth and loading it into dump trucks. The dump trucks draw alongside the exposed soil profile, standing and travelling only on the basal layer (see **Diagram 6-1** and **Diagram 6-2** below).

Diagram 6-1:
Soil stripping using modified layer by layer practice (The Institute of Quarrying, 2021)[1]

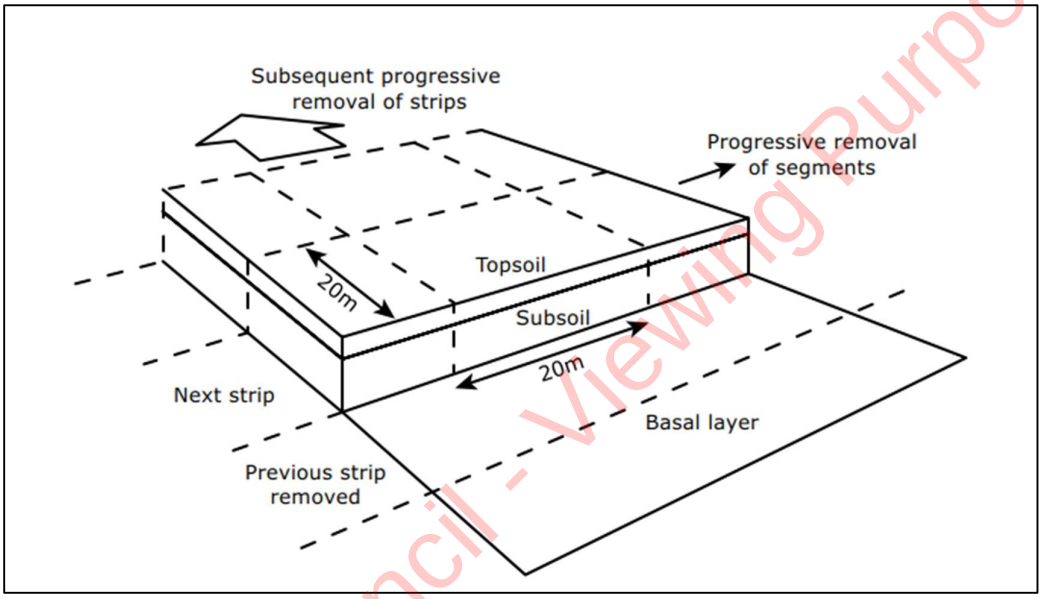
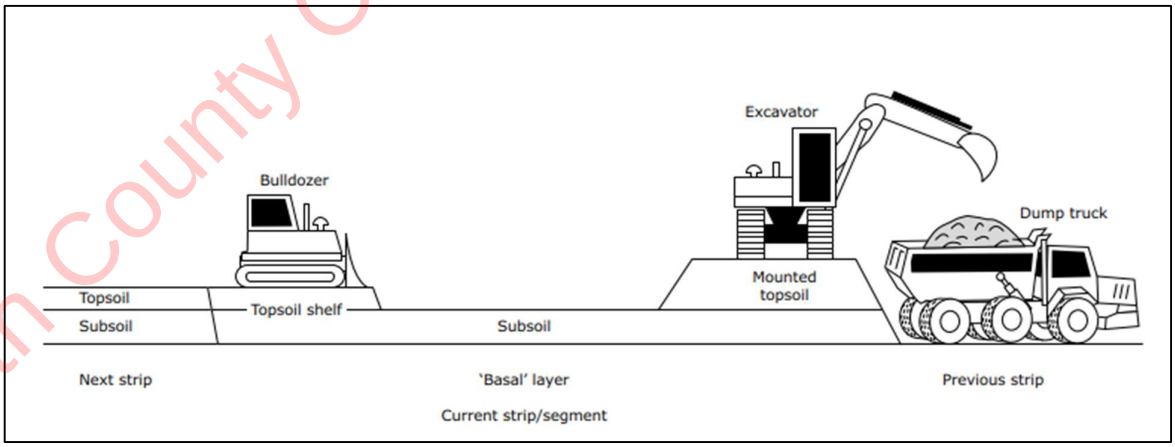


Diagram 6-2:
Topsoil stripping using modified layer by layer practice (The Institute of Quarrying, 2021)[2]



[1] Good Practice Guide for Handling Soils in Mineral Workings, The Institute of Quarrying (2021)
[2] Good Practice Guide for Handling Soils in Mineral Workings, The Institute of Quarrying (2021)

6.82 Topsoil storage will not exceed 3 m in height in order to protect the structure of the soils for use in restoration and any subsoils, if present, will be stored at a maximum height of 5 m.

6.83 Stripped soil will be re-vegetated where they are in place for a sufficient length of time to justify such a measure. The re-handling of soil material will be minimised as much as possible in order to preserve the integrity of the topsoil material. This is also an economically prudent practice.

Subsoils

6.84 Sand and gravel material will be extracted, processed and used in the existing concrete batching plant.

Geology

6.85 It is not proposed to extract bedrock as part of this development at Naul and, therefore, no mitigation measures are required. There will be no effect on the geology during construction.

Geological Heritage

6.86 There will be no effect on geological heritage arising from the proposed development.

Operational Stage

6.87 The design of the extraction area has provided suitable set-back distances to adjoining land boundaries and the final pit slopes during the operational and post-operational stages are designed to ensure long term stability.

6.88 Operations at the proposed development site will comply with the Health and Safety Authority Safe Quarry Guidelines in relation to the Safety Health and Welfare at Work (Quarries) Regulations 2008 to ensure stability of the adjoining lands.

6.89 No mitigation measures are required for geology or geological heritage during the operational stage.

Post-Operational Stage (Final Restoration)

6.90 On cessation of extraction the land within the extraction area will be restored to agricultural use. The final restored pit slopes are designed to ensure long-term stability.

6.91 No mitigation measures are required for geology or geological heritage during the post-operational stage.

RESIDUAL IMPACT ASSESSMENT

6.92 The residual impacts on land, soil and geology are those impacts which remain following the implementation of the mitigation measures outlined above.

Construction Stage

6.93 There are no residual impacts associated with this stage of the development, other than those outlined in the Operational Stage, below.

Operational Stage

6.94 With the restoration of the site to agricultural land use, the long-term impact of the proposed development on land use will be low to imperceptible.

6.95 The soils at the site will become part of the restoration to agricultural land use. With this mitigation measure in place it is considered that the residual impact on soils will be low to imperceptible.

6.96 The operation of the pit will be in line with the Health and Safety Authority Safe Quarry Guidelines in relation to the Safety Health and Welfare at Work (Quarries) Regulations 2008, and will limit the potential for unplanned events such as instability of pit face or instability in adjacent lands. Therefore, it is considered that the residual impact of the proposed development on land stability will be low to imperceptible.

MONITORING

6.97 The ongoing restoration works will be managed and monitored throughout the life of the development including the one-year proposed final restoration period to ensure that the restored soils and land use is successful and to confirm that the restored final pit faces are stable, refer to EIAR Chapter 2 - Project Description.

6.98 Thereafter, no monitoring is required in terms of land, soil and geology. It is expected that following restoration, the restored landform will ultimately merge into the surrounding local rural agricultural landscape.

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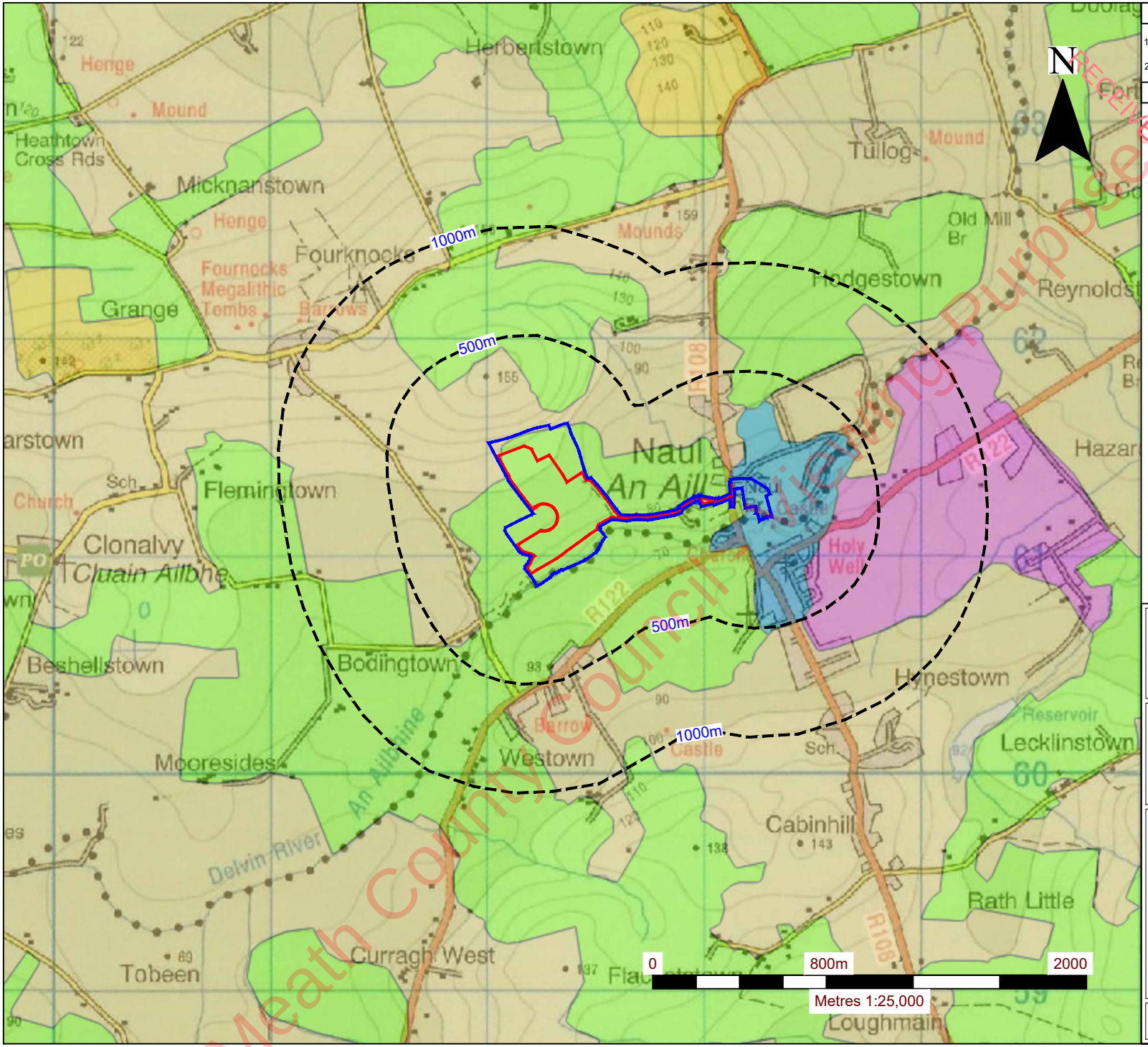
FIGURES



NOTES

1. Extract from Ordnance Survey Discovery Series Map No. 43
2. Ordnance Survey Ireland Licence No. CYAL50381397 (c) Tailte Éireann - Surveying

LEGEND

- LAND INTEREST BOUNDARY
- PLANNING APPLICATION AREA

LEGEND

- NON-IRRIGATED ARABLE LAND
- PASTURES
- BROAD-LEAVED FOREST
- MINERAL EXTRACTION SITES
- COMPLEX CULTIVATION PATTERNS

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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

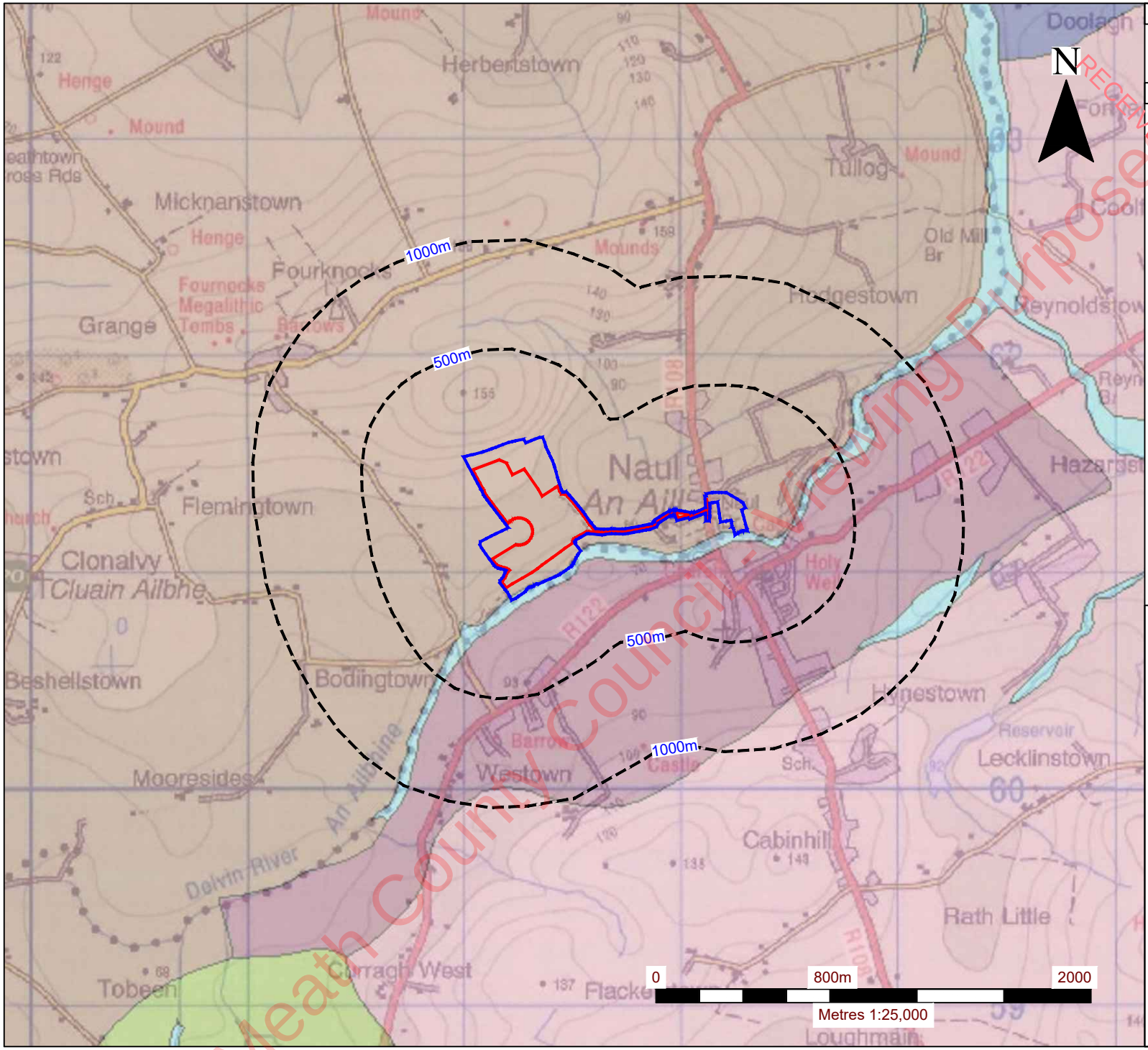
PROPOSED SAND & GRAVEL EXTRACTION AT NAUL TOWNLAND, CO. MEATH

CORINE LAND COVER MAP

FIGURE 6-1

Scale	Date
1:25,000 @ A4	OCTOBER 2024

00036.064988 Naul.EIAR-Fig6-1 Land Cover Map R1.dwg



NOTES

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LEGEND

LAND INTEREST BOUNDARY

PLANNING APPLICATION AREA

LEGEND

- Ballylanders
- Clonroche
- Crosstown
- Drumkeeran
- Elton
- River
- Rock
- Straffan
- Urban

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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

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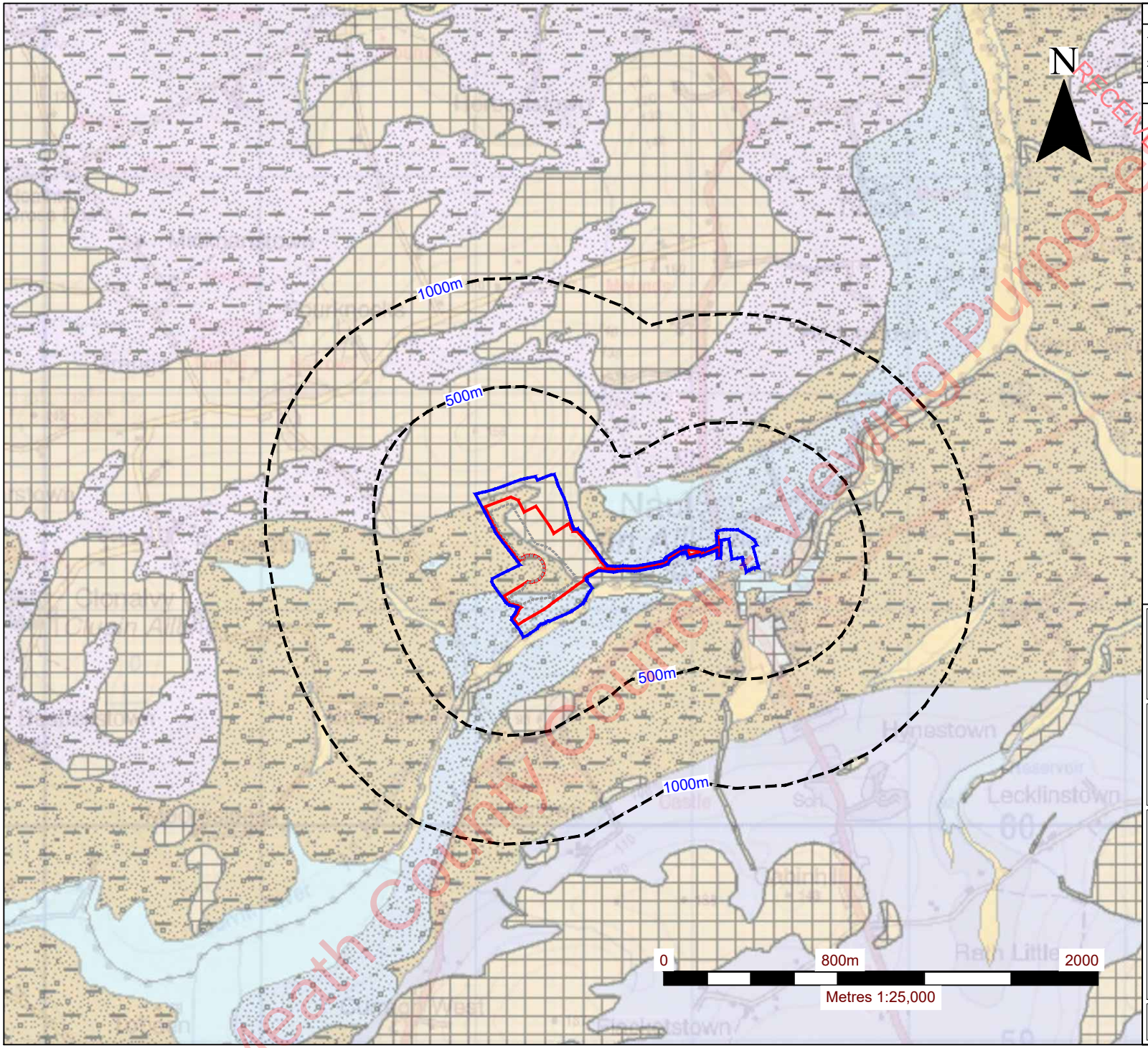
REGIONAL SOILS MAP

FIGURE 6-2

Scale	Date
1:25,000 @ A4	OCTOBER 2024

00036.064988 Naul.EIAR-Fig6-2 Soils Map R1.dwg



NOTES

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LEGEND

LAND INTEREST BOUNDARY

PLANNING APPLICATION AREA

PROPOSED EXTRACTION AREA

LEGEND

- Alluvium
- Gravel - Lower Palaeozoic Sandstone & Shale
- Till - Lower Palaeozoic Sandstone and Shale, Irish Sea Basin Matrix
- Till - Lower Palaeozoic Sandstone & Shale
- Rock - Karstified
- Rock - Undifferentiated
- Lacustrine
- Made Ground

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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

PROPOSED SAND & GRAVEL EXTRACTION AT NAUL TOWNLAND, CO. MEATH

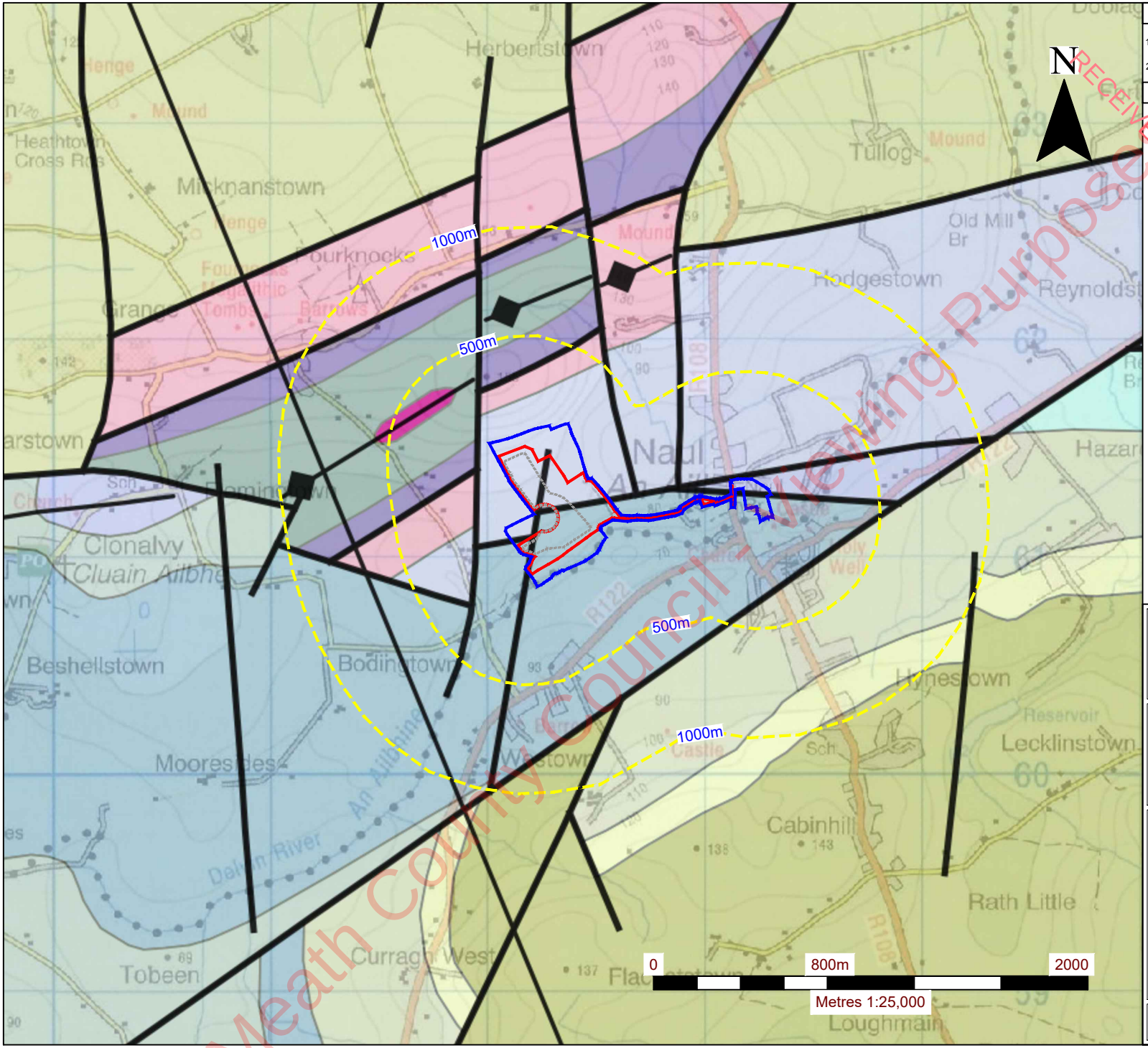
SUB-SOILS MAP

FIGURE 6-3

Scale: 1:25,000 @ A4

Date: OCTOBER 2024

00036.064988 Naul.EIAR-Fig6-3 Sub-Soils Map R1.dwg



NOTES

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LEGEND

- LAND INTEREST BOUNDARY
- PLANNING APPLICATION AREA
- PROPOSED EXTRACTION AREA

LEGEND

- CLASHFORD HOUSE FORMATION
- MUDBANK LIMESTONE
- NAUL FORMATION
- HERBERTSTOWN FORMATION
- SNOWTOWN FORMATION
- FOUMOCKS FORMATION
- DIORITE
- LUCAN FORMATION
- DENHAMSTOWN FORMATION
- LOUGHSHINNY FORMATION
- BALRICKARD FORMATION
- WALSHESTOWN FORMATION
- FAULT

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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

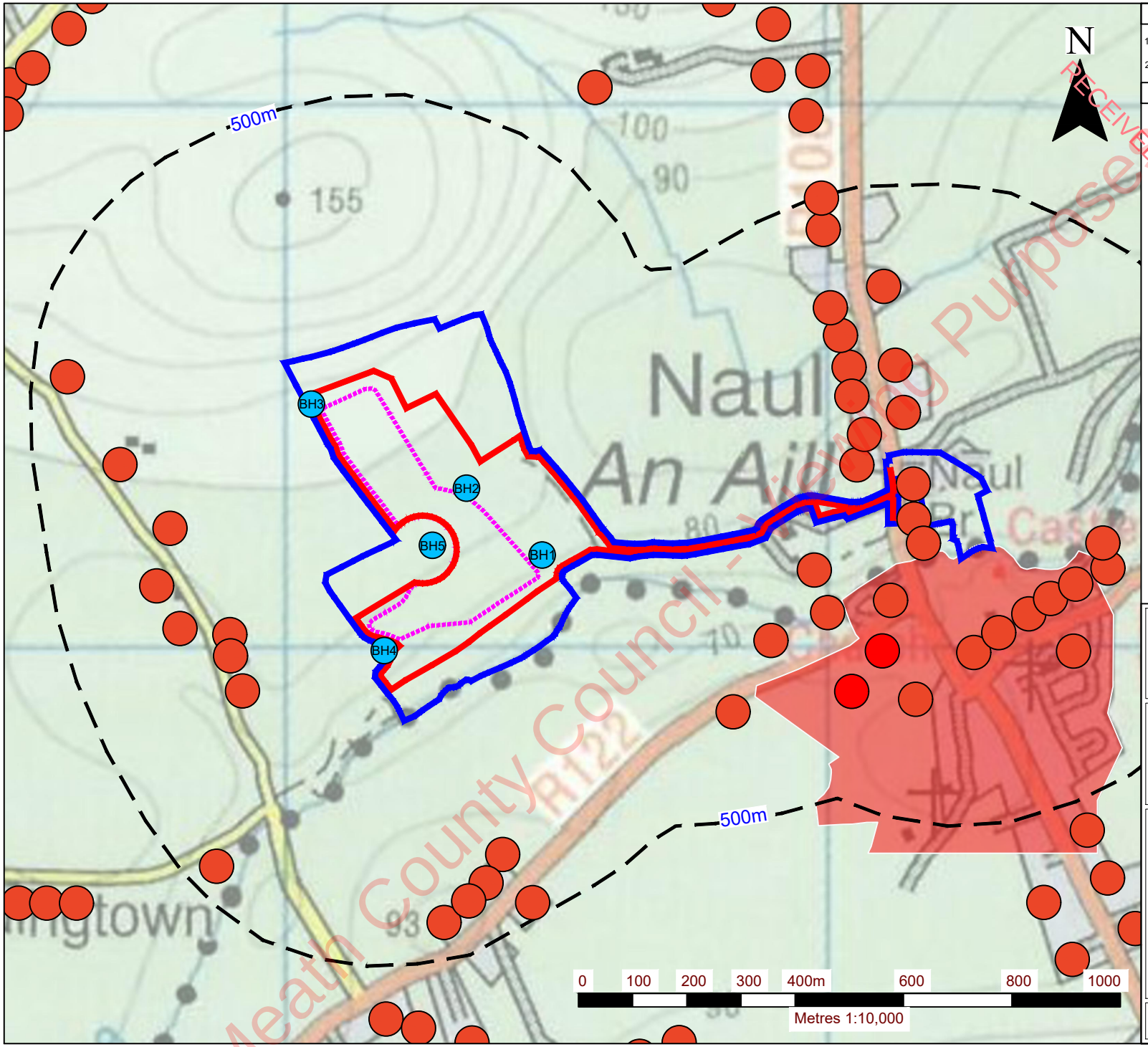
PROPOSED SAND & GRAVEL EXTRACTION AT NAUL TOWNLAND, CO. MEATH

REGIONAL GEOLOGY MAP

FIGURE 6-4

Scale	Date
1:25,000 @ A4	OCTOBER 2024

00036.064988 Naul.EIAR-Fig6-4 Geology Map R1.dwg



NOTES

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LEGEND

- LAND INTEREST BOUNDARY
- PLANNING APPLICATION AREA
- PROPOSED EXTRACTION AREA
- RESIDENCE LOCATIONS
- BH1 SITE BOREHOLE LOCATIONS (2019)

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PROPOSED SAND & GRAVEL EXTRACTION AT NAUL TOWNLAND, CO. MEATH

SITE BOREHOLE LOCATIONS

FIGURE 6-5

Scale: 1:10,000 @ A4

Date: OCTOBER 2024

00036.064988 Naul.EIAR-Fig6-5 Site BH locations R1.dwg