CONTENTS

INTRODUCTION

16.1 This chapter of the Environmental Impact Assessment Report (EIAR) provides a summary of mitigation and monitoring commitments set out within the technical chapters, as recommended by Section 3.8.4 of the Environmental Protection Agency (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports.

Inherent and 'Designed-In' Mitigation Measures

16.2 The application site, by its nature, offers a number of advantages in terms of natural mitigation. The Zone of Theoretical Visibility model detailed in Chapter 13 of this EIAR confirmed that the application area is fully screened in views from most publicly accessible locations. This is mainly due to intervening vegetation, but also due to built structures in the case of locations within Naul. These areas of no actual visibility include the residential properties along the local road to the west of the application area and the Architectural Conservation Area within the Naul village.

16.3 A number of elements of the proposed development have been designed with the specific purpose of reducing the potential environmental effects of the proposed sand and gravel pit. The design of the proposed development is responsive to feedback obtained during the previous planning application process and subsequent refusal by An Bord Pleanála. 'Designed-In' mitigation measures for the protection of water environment (surface water and groundwater) include:

- The final floor level of the proposed pit has been amended to reflect the local hydrogeological regime and to reduce the works below the water table;
- The proposed development includes a phased operational phase whereby each of the 3 no. proposed extraction areas will be restored upon completion of the extraction in these areas (thereby reducing the area of exposed sand and gravels at any one time); and
- The proposed development includes an aggregate washing plant which removes the requirement for large settlement ponds at surface level.

16.4 Sections of the existing topography within the site will be retained for as long a duration as possible to further minimise the extent of lands being disturbed at any one time. The proposed phasing of extraction and progressive restoration works have also been designed with the intention of minimising the visual and landscape impacts as far as possible. A total of 470 m of native hedgerow will be planted within the site to provide compensation habitat for nesting/foraging birds and foraging/commuting bats.

16.5 An archaeological buffer zone of 40m has been incorporated around a designated ringfort monument MH034-031 immediately west of the application site.

16.6 Access upgrades and road strengthening proposals proposed in the vicinity of the existing agricultural entrance will provide for improved visibility sightlines and provide a new and uniform road surface.

16.7 The proposed development will benefit the wider road network as it will eliminate (bar the c. 70m distance from the site entrance to the concrete batching facility) all associated aggregates supply HGV traffic travelling in both directions on the R108 which import materials to the concrete batching facility from other Kilsaran supply sites currently at Annagor and Ballynamona. Eliminating the requirement to transport materials from Ballynamona will also have the added benefit of eliminating those HGV truck movements passing through Naul village towards the concrete batching facility for the duration of the development life.

Legislation and Best Practice Mitigation Measures

16.8 The operation of the facility will be covered by legislation and industry best practice that is followed by Kilsaran in all of its operations.

16.9 For example, 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.

16.10 Current best practice guidance include, but is not limited to the following:

- EPA Environmental Management Guidelines (2006): Environmental Management in the Extractive Industry (Non-Scheduled Minerals); and
- DoEHLG (Department of the Environment, Heritage and Local Government) April 2004: Quarries and Ancillary Activities Guidelines for Planning Authorities.

Specific Mitigation Measures

16.11 **Table 16-1** below sets out the specific mitigation measures that are proposed to be implemented through the proposed development

Table 16-1
Schedule of Site-Specific Mitigation Measures to be Implemented

Mitigation Measure Proposed		Timeframe
General	Kilsaran operates an environmental management programme to monitor and manage emissions from all their established operations, including the existing concrete batching plant facility.	Throughout all activities of the application
Population and Human Health - General	The main potential for disturbance to the local population and human health is through the potential for environmental emissions associated with the topic areas that are assessed within other chapters of the EIAR, therefore the mitigation measures proposed in relation to those are considered appropriate to address population and human health issues	Throughout lifetime of development
Biodiversity – Ditch Removal	It is recommended that the ditches are removed between September-January. During this time there is unlikely to be any frogspawn, or tadpoles present within the drainage ditches and, as such, there will not be any direct impacts on any potential common frog population on-site. If the drainage ditches must be removed between February-August, the following mitigation measures are recommended to prevent direct impacts on breeding frogs on-site: • A pre-commencement survey will be carried out between February and end of March by an appropriately qualified ecologist to determine if frogspawn, breeding frog or smooth newts are present within the ditch. eDNA surveys should be used as a quick method to confirm presence/absence of these protected species. • If present, frogspawn, tadpoles, frog and smooth newt will be captured and removed from the drainage ditches and translocated to the nearest area of available suitable habitat (i.e. another drainage ditch on-site or the Devlin River to the south of the Site), under licence from NPWS. • Any capture and translocation shall be undertaken immediately in advance of the removal of drainage ditches to prevent further breeding of common frog taking place between translocation and ditch removal.	During Site Clearance

Biodiversity – Vegetation Removal	Vegetation clearance will be carried out outside of the bird nesting season (1st March – 31st August inclusive)	
Biodiversity – Badger Protection	The following mitigation measures are recommended to prevent disturbance of breeding badger on-site: • A pre-commencement survey will be carried out on the inactive badger setts prior to starting works to identify badger activity on-site and to determine if the setts have been re-occupied. Trails cameras should be erected to detect any activity at the potential sett locations. • If the setts are confirmed to be active, in agreement with the Project Ecologist a 50 m exclusion zone will be placed around the sett entrances where no works will be carried out, or the route of the road is adjusted to avoid the sett. • If a badger sett is identified after the commencement of works, a 50 m exclusion zone will be immediately established around the sett entrance and all works within this exclusion zone will cease until the sett is determined to be inactive or the sett is removed following the below step. • If works must be carried out within the 50 m exclusion zone of an active sett, there should be a general commitment to monitor and minimise effects on Badgers in line with best practice and in consultation with the local authority and NPWS.	Prior to Site Clearance
Biodiversity – Habitats	The overburden and topsoil storage areas will be seeded with a mix of suitable grasses.	During operation
Land, Soils and Geology – Soil Management	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. 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 as set out in The Institute of Quarrying guidelines. 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	Throughout works

	potential for dust generation during extended periods of dry weather, and conversely the greater potential for soil.	
Land, Soils and Geology – Soil Storage	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. Topsoil storage will not exceed 3m 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 5m. 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.	Throughout works
Land, Soils and Geology – Stability	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. 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. The final restored pit slopes are designed to ensure long-term stability.	During operation and restoration
Hydrology and Hydrogeology – Spill / Accident Prevention	The following measures will be implemented at the site to prevent leaks and/or spills: • No fuel will be stored on-site; • All mobile machinery refuelling will be carried out using a mobile bowser; • Drip trays will be used for all re-fuelling activities; • All machinery maintenance and repairs will take off-site at the existing concrete batching plant facility; • All plant will be regularly maintained and inspected daily for leaks of fuels, lubricating oil or other contaminating liquids;	Throughout works

	• All petroleum-based products (lubricating oils, waste oils, etc.) will be stored on drip trays under cover to prevent pollution due to accidental leakages; • Waste oil and grease containers will be stored under cover in storage container. Waste containers will be collected and disposed of by a suitably licenced contractor; • An emergency spill response kit (with containment booms, absorbent materials and drip tray) will be available on-site to contain/ stop the migration of any accidental spillages, should they occur; • Plant operators will be briefed during 'toolbox' talks and site induction on where the spill kit is kept and how and when it is deployed; • Traffic management system at the site will reduce conflicts between vehicles, and the potential risk of collisions and associated fuel spills or oil leaks; • Site speed limits will be implemented across the site to further reduce the likelihood and significance of collisions and hence the possibility of a fuel leak from such a collision.	
Hydrology and Hydrogeology – Prevention of Suspended Solids in Runoff Biodiversity - River	• Prior to any overburden stripping or extraction a shallow cut-off drain will be installed along the southern boundary of the site to prevent any site run-off which may potentially contain suspended solids from flowing over ground to the adjacent Delvin River. The proposed cut-off drain will run parallel to the river and will be between 40 and 50m from the river channel leaving a significant buffer zone between the drain and the river. Water within the cut-off drain will be discharged to ground; • In addition to the cut-off drain, a silt fence will be erected along the riverside edge of the drain to further ensure no run-off from the site has potential to reach the river; • Access track drainage works will be carried out along the northern edge of the track to provide a linear filter drain with the access track cambered towards the filter drain to allow any surface water runoff percolate to the ground. This will prevent any surface water run-off from the access road in a southerly direction towards the Delvin river; • Soil stripping and restoration of worked out areas will be carried out on a progressive basis; • The temporary soil / subsoil areas will be managed to minimise the risk of rain / wind erosion;	Throughout works

	• Daily monitoring of the overburden stripping and soil storage areas will be completed by a suitably qualified person. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter will enter the downstream receiving waters; • Overburden stripping and landscaping works will be scheduled for periods of low rainfall (summer months) to reduce run-off and potential siltation; • Landscaped areas and perimeter berms will be planted with grasses as soon as possible after formation to reduce the potential of surface water erosion; • Good construction practices such wheel washers and dust suppression on site roads, and regular plant maintenance will ensure minimal risk. The Construction Industry Research and Information Association (CIRIA) provide guidance on the control and management of water pollution from construction sites ('Control of Water Pollution from Construction Sites, guidance for consultants and contractors', CIRIA, 2001), which provides information on these issues. This will ensure that surface water arising during the course of overburden stripping and landscaping activities will contain minimum sediment.	
Hydrology and Hydrogeology – Groundwater Protection	Soil stripping and restoration of worked out areas will be carried out on a progressive basis to reduce the vulnerability of the bedrock aquifer to possible contamination. Post extraction the restoration plan will be implemented which will involve the previously stripped soil being placed on the pit floor to establish grassland which will provide a level of protection to groundwater. Post restoration, the site will be returned to agriculture which will reduce the risk of illegal activities such as fly-tipping.	Restoration
Air Quality – Dust Minimisation	• Drop heights will be minimised when handling material; • Materials will be placed directly into screening storage area or in progressive works; • Works will be avoided in adverse/ windy conditions; • Works will be carried out in areas protected from wind where possible; • Water sprays will be used to moisten handled material; • Onsite haul routes will be minimised; • Water sprays / tractor & bowsers will be used to moisten surfaces during dry weather;	Throughout works

	• Vehicle speeds will be restricted through signage / staff training; • Haul routes will be directed away from sensitive receptors; • Road sweeper will be used to reduce the amount of available material for re-suspension; • Access road will be paved; • Surfaces of completed mounds / bunds of topsoil will be seeded; • Mechanical disturbance will be limited; • Working in adverse weather conditions and with faulty dust filters will be avoided; • Hedgerows to be retained as far as possible; • Perimeter screening berms to be implemented; • Effective site management practices are critical to demonstrate the willingness of the operator to control dust emissions. Monitoring of dust deposition and recording of any complaints shall be carried out to take appropriate measures to reduce emissions in a timely manner; • Training on dust mitigation measures shall be provided to site-based staff. Training will also cover an 'emergency preparedness plan' to react quickly in case of any failure of dust mitigation measures.	
Climate Change - Resilience	• Consider changes / flexibility in construction / operations that allow for rising water levels and groundwater levels; • Consider weather warnings and create plans adequate to warning intensity; • Design / provide adequate surface water drainage; • Design / provide adequate procedures for wildfire scenarios; • Ensure design can withstand increases in high winds and storms; • Ensure the choice of equipment is weather efficient; • Secure insurance for damage of assets / site incidents.	Throughout the development and with experience of climate trends
Climate Change – Mitigation /	• Consider using renewable energy sources / suppliers; • Consider clean energy production on site;	Throughout the development and as

Reduction of GHG Emissions	• Use energy efficient machinery; • Unnecessary equipment / transport journeys should be avoided by management of transport and travel demands; • Equipment should not be left idling; • Training programme for GHG mitigation to be provided for employees/ contractors	technology continues to develop
Noise Management	The Applicant intends to implement best practice construction noise and management techniques throughout the works, such as. **Screening:** • Top soil and overburden storage mounds will act as acoustic barriers to the residences; • Existing perimeter hedge planting will be retained. **Plant:** • All mobile plant used at the development will have noise emission levels that comply with the limiting levels defined in EC Directive 86/662/EEC and any subsequent amendments; • All plant items will be properly and regularly maintained and operated according to the manufacturers' recommendations, in such a manner as to avoid causing excessive noise (i.e. all moving parts are kept well lubricated, all cutting edges are kept sharpened, the integrity of silencers and acoustic hoods are maintained); • All plant will be fitted with effective exhaust silencers which are maintained in good working order to meet manufacturers' noise rating levels. Any defective silencers will be replaced immediately. **Traffic:** • All operations on site will be programmed to be carried out during daytime hours only; • Care will be taken when loading vehicles to reduce or minimise potential disturbance to local residents; • Access / internal haul roads will be kept clean and maintained in a good state of repair, i.e. any potholes are filled and large bumps removed, to avoid unwanted rattle and "body-slap" from heavy goods vehicles;	Throughout works

	• Vehicles waiting within the pit will be prohibited from leaving their engines running and there should be no unnecessary revving of engines.	
Cultural Heritage	Anomalies 13, 15 and 19 and Features F1, F2 and F3 that have been identified through previous site investigations will be preserved by record in advance of development under licence from the National Monuments Service.	During Site Clearance
Traffic – Construction Management	A detailed Construction Traffic Management Plan (CTMP) will be finalised and agreed with the local authority prior to construction works commencing on site. The detailed CTMP will detail the mitigation measures outlined below: • A dedicated competent Traffic Management Coordinator will be appointed for the duration of the construction of the proposed access improvement works; • The TMP will identify those roads that will be used for access and will set out any particular roads that are to be avoided for HGV construction traffic; • Contractors staff and drivers delivering materials to site will receive clear guidance on the preferred routes to site which will be the existing haul routes associated with the concrete batching plant and incorporating the R108 and R122; • Temporary traffic management will be planned and executed in accordance with best practice, including Chapter 8 of the Traffic Signs Manual as published by the Department of Transport; • Traffic management details relating to the works will be agreed with the roads authority in advance of the works. There will be no requirement to close the public road. Insofar as practicable two-way traffic can be maintained throughout the contract with the need for stop/go shuttle working and lane closure limited to short off-peak periods.	Prior to Commencement
Traffic – General Management	A dedicated Logistics Coordinator will be appointed, who will be the main point of contact for all matters relating to traffic management on a day-to-day basis at the site. It is likely that this role will be fulfilled by the site Operations Manager.	Throughout works

	All drivers and companies delivering to or collecting from the site, during both the construction and operational phases, will be made aware of the appropriate haul routes and will receive a comprehensive site induction which will include instructions on traffic management.	
Traffic – Road Maintenance	Road improvement works will be implemented as part of the proposed development. In addition, in the event of a grant of planning permission, the levy of contributions and payments to the planning authority, will include an allocation to the county schedule of ongoing road maintenance.	On grant of planning permission
Traffic – Enhanced Road Signage	It is proposed that new advance signs will be provided by the Applicant, details of which are to be agreed with MCC.	Prior to commencement

MONITORING MEASURES

16.12 A number of environmental monitoring activities are to be continued during all stages of the proposed development to confirm the effectiveness of the mitigation measures described above, to establish if there are any trends in environmental parameters and to highlight the need for remedial action if necessary.

16.13 Environmental monitoring requirements have been identified in the specific chapters of the EIAR. The frequency of the monitoring requirements identified below have been collated and provided in a schedule displayed in **Table 16-2**. **Figure 16-1** indicates the monitoring locations across the application site. Additional monitoring locations can be provided if deemed necessary by Meath County Council should planning permission be granted.

Population and Human Health

16.14 Monitoring for the protection of population and human health during the proposed development will be carried out in accordance with the wider environmental monitoring programme for the protection of water, air quality and noise.

Biodiversity

16.15 It is recommended that the breeding bird population on-site is monitored annually during the proposed development using the Countryside Bird Survey methodology which will consist of two early morning survey visits between April and June.

16.16 Trail cameras can be used to monitor potential badger activity near the locations where previous old setts have been reported. Static bats detectors should also be employed to monitor the movement of bats to ensure the construction and operational works are not effecting the local bat populations.

Land, Soils and Geology

16.17 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.

16.18 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.

Hydrology and Hydrogeology

16.19 It is not proposed to discharge any site waters to the Delvin river and therefore the proposal poses no pollution potential to surface water. Notwithstanding this, the applicant would be agreeable to carrying out surface water sampling at a location upstream and downstream of the site on a bi-annual basis.

Groundwater

16.20 A number of groundwater monitoring wells have been drilled around the perimeter of the proposed extraction area.

16.21 Groundwater levels will be recorded on a quarterly basis in the on-site monitoring wells. Groundwater levels will also be recorded on a quarterly basis in residences R2 and R16 subject to owner consent.

16.22 It is proposed to undertake groundwater quality monitoring at R2 (groundwater quality to the south of the site) and R16 (groundwater quality lateral to the site) subject to owner consent. Baseline groundwater samples will be taken prior to the commencement of works. The analysis will be undertaken by an accredited laboratory. Groundwater samples will be tested for the following parameters:

- Conductivity (µS/cm);
- pH;
- Total Petroleum Hydrocarbons (TPH) (mg/l);
- Petroleum Range Organic (PRO) (mg/l); and
- Diesel Range Organics (DRO) (mg/l).

16.23 The results of the groundwater monitoring programme will be submitted to Meath County Council on a quarterly basis.

Air Quality

16.24 Dust deposition monitoring will continue to be undertaken at the application site. Five monitoring locations were included in the baseline survey and will be monitoring for the duration of the development – refer to **Figure 16-1** for locations.

16.25 The dust monitoring gauges will be located close to emission sources or potentially sensitive receptors located beyond the site boundary. It is proposed that the dust monitoring stations will remain in place for the duration of extraction and processing operations at the site and be monitored on a monthly basis similar to Condition No. 4 of the planning permission ABP-314881-22 (P. Ref. 22/153) in relation to the existing Kilsaran concrete batching plant.

16.26 Dust monitoring locations shall be reviewed and revised where and as/when necessary. The results of the dust monitoring shall be submitted to Meath County Council on an annual basis for review and record purposes.

Climate Change

16.27 A framework and set of indicators shall be developed to assess project preparedness for adaptation against climate change. Provision shall be made for a periodic review of plans and the allocation of reporting responsibilities for a regime to measure and evaluate progress on adaptation.

16.28 This process shall include regular feedback and/or updates from the implementation efforts. Enhancement and monitoring related to the projects' predicted impacts with respect to climate change should be set out in an Environmental Management Plan.

Noise

16.29 Noise monitoring shall be undertaken around the application site. The 6 baseline noise monitoring locations shall be reviewed and revised where and as/when necessary. The results of the noise monitoring shall be submitted to the Meath County Council on a regular basis for review and record purposes.

Cultural Heritage

16.30 Details to be agreed under licence from the National Monuments Service.

Landscape and Visual

16.31 A 2-year aftercare period is proposed as part of the Restoration Proposals (refer to EIAR **Figure 2-6**), to ensure the successful establishment of the native hedge planting.

Traffic

16.32 The contractor will be required to ensure construction activities operate within the parameters set out in the Construction Traffic Management Plan.

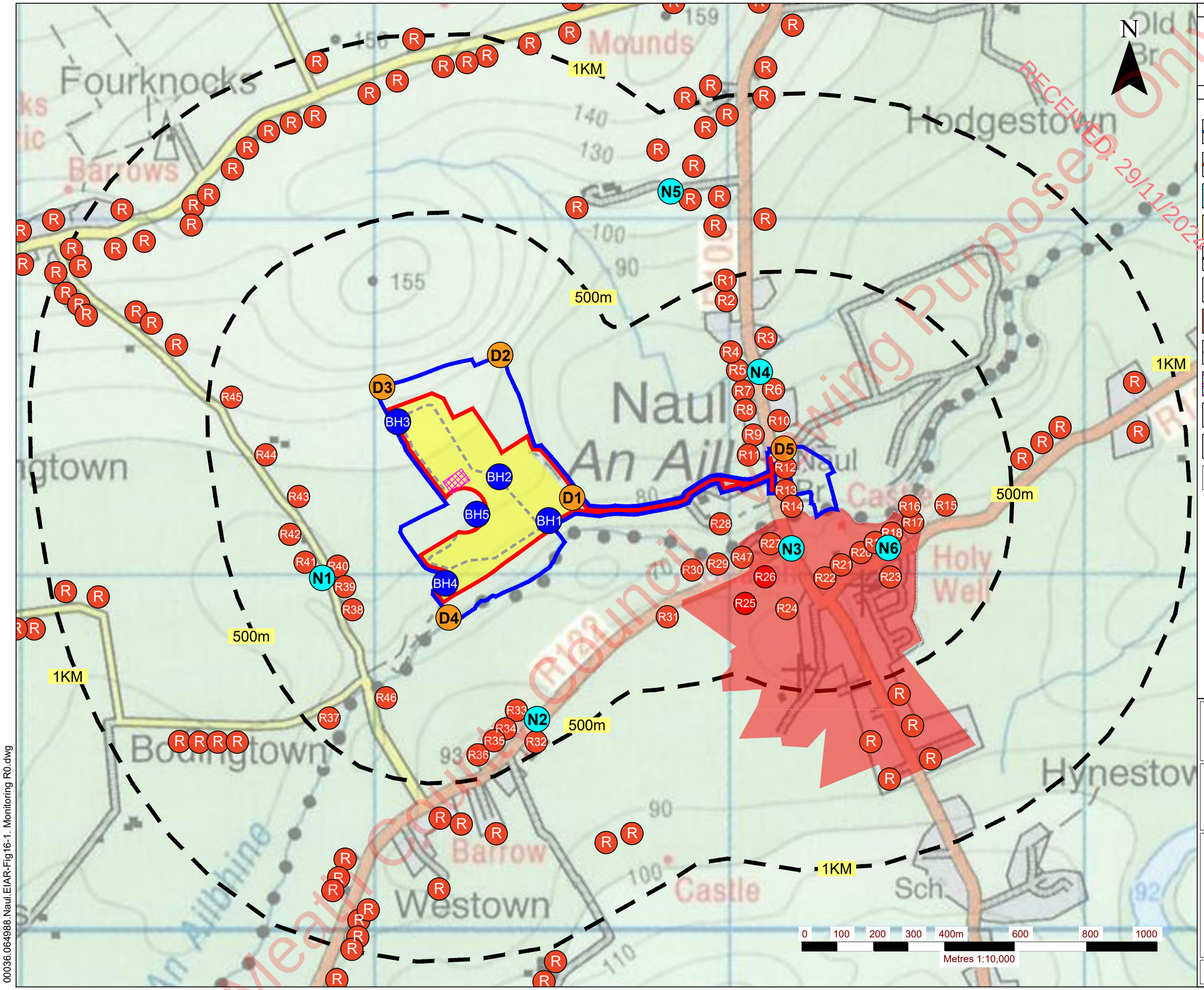
Table 16- 2

Indicative Schedule of Environmental Monitoring

Activity (Responsibility)	Q1			Q2			Q3			Q4		
	J	F	M	A	M	J	J	A	S	O	N	D
Biodiversity Biannual Breeding Bird Surveys (indicative months) 2 surveys between April and June												
Land, Soils and Geology Continual during works and restoration												
Surface Water Quality Biannual (indicative month)												
Groundwater Levels and Quality Quarterly (indicative months)												
Monthly Dust												
Climate Progress – GHG Monitoring Report (Kilsaran)	*In line with wider Kilsaran ESG Reporting*											
Noise Monitoring *Annual tbc			*									
Cultural Heritage tbc with NMS	*As works occur*											
Landscape Maintenance Two years following Year 12 – Final Restoration)												

FIGURES

Figure 16-1:
Environmental Monitoring Locations



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 AREA c.25 HECTARES (c.61.8 ACRES)
- APPLICATION AREA c.14.9 HECTARES (c.36.8 ACRES)
- EXISTING KILSARAN BATCHING PLANT P.REFS. 80/572 & 22/153 (ABP-314881-22)
- PROPOSED SAND AND GRAVEL PIT OPERATIONAL SITE AREA
- 500M & 1KM OFF-SET BOUNDARY TO APPLICATION SITE AREA (RED LINE) & EXISTING CONCRETE PLANT (CYAN AREA)
- R R RESIDENCE / RECEPTOR LOCATIONS
- NAUL VILLAGE
- PROPOSED EXTRACTION AREA c.6.2 HECTARES (c.15.3 ACRES)
- PROPOSED PROCESSING AREA (ON PIT FLOOR)
- D1 DUST MONITORING LOCATIONS
- N1 NOISE MONITORING LOCATIONS
- BH1 GROUNDWATER MONITORING LOCATIONS

Kilsaran
ideas taking shape

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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

SAND & GRAVEL DEVELOPMENT
AT NAUL TOWNLAND, CO. MEATH

ENVIRONMENTAL MONITORING LOCATIONS

FIGURE 16-1

Scale	Date
1:10,000 @ A3	OCTOBER 2024

00036.064988.Naul.EIAR-Fig16-1. Monitoring R0.dwg