NON-TECHNICAL SUMMARY

Environmental Impact Assessment Report

Inert Landfill and Construction and Demolition (C&D) Waste Recovery Facility

Ballinclare Quarry, Kilbride, Co. Wicklow

Prepared for : Kilsaran Concrete Unlimited Company

SLR Ref: 501-00036.00080
Version No : FINAL
April 2021

BASIS OF REPORT

CONTENTS

FIGURES

1.0 INTRODUCTION

1.1 Development Overview

This Environmental Impact Assessment Report (EIAR) Non-Technical Summary has been prepared in support of Application for Strategic Infrastructure Development to An Bord Pleanála and a Waste Licence Application to the Environmental Protection Agency (EPA) by Kilsaran Concrete Unlimited Company (hereinafter 'Kilsaran') to

- develop and operate an inert landfill facility at its existing quarry in Ballinclare, near Kilbride, Co. Wicklow to backfill it to original (pre-development) ground level using imported inert soil and stone waste;
- progressively restore the backfilled quarry to long-term grassland / scrub habitat, similar to that which existed prior to the quarry development and
- establish and operate a construction and demolition (C&D) waste recovery facility across the footprint of a pre-existing concrete blockyard at the quarry; and
- install and operate a soil washing plant at the former concrete / asphalt production yard to recover sand and gravel aggregate from soil waste for subsequent use in the production of construction materials.

It is anticipated that the inert soil and stone / C&D waste to be imported, managed and handled at the facility will be generated by construction projects in Counties Wicklow, Dublin and Wexford.

The principal non-soil and stone / C&D wastes to be recycled at this facility will include solid concrete (ready-mixed, reinforced, blocks and/or pavement slabs), bricks, ceramics and solid bituminous waste mixtures (hardened asphalt returns and road planings). These materials will be processed (crushed and screened) and supplied as recycled (secondary) aggregates to the construction market, subject to End of Waste criteria to be set by the Environmental Protection Agency (EPA).

The soil washing plant to be installed at the facility will effectively recover sand and gravel and secondary aggregates from selected, more granular soil waste and mixed, clay bound construction and demolition waste imported to the facility. Soil washing activities will continue in operation up to the final phase of proposed landfilling across the former concrete / asphalt production area.

For the purposes of the Strategic Infrastructure application, it is envisaged that C&D waste recovery activities will continue for the duration of the landfilling / phased restoration operations and that planning permission for the activity will expire thereafter.

The proposed development provides for the following:

- Backfilling of the existing void at Ballinclare Quarry to original ground level by developing and operating an inert waste landfill facility with a total intake capacity of approximately 6,165,000 tonnes of inert soil and stone waste and (non-waste) soil and stone by-product and its progressive restoration to long-term grassland / scrub habitat thereafter;
- Continued use of existing site infrastructure and services including, site / weighbridge office, staff welfare facilities, wastewater treatment system, outbound weighbridge, garage / workshop, wheelwash, hardstand areas, fuel and water storage tanks to service the proposed development;
- Installation of a new weighbridge along the inbound lane of the quarry access road;
- Decommissioning of any remaining fixed plant and infrastructure associated with former rock extraction activities or with aggregate, concrete and asphalt production activities at the application site;

- Off-site removal of any materials or bulky wastes associated with the former quarrying and production activities;
- Construction of an industrial shed (portal frame structure) at the paved blockyard area to house crushing and screening equipment and to process / recycle inert C&D waste (principally concrete, bricks, ceramics and solid bituminous waste mixtures);
- Use of any external paved area surrounding the C&D waste processing shed as a hardstanding area for the external handling and storage of both unprocessed and processed C&D wastes;
- Separation of any intermixed C&D wastes (principally metal, timber, PVC pipes and plastic) prior to its removal off-site to authorised waste disposal or recovery facilities;
- Installation and operation of a soil washing plant at the former concrete / asphalt production yard to recover sand and gravel and secondary aggregates from soil waste for subsequent use in the production of construction materials
- Construction of an on-site (passive) wetland treatment system and attendant drainage infrastructure to treat surface water run-off / groundwater collecting in the sump / floor of the quarry area during landfilling operations and any surface water run-off from the C&D waste recovery area prior to its discharge off-site;
- Re-use of an existing storage shed as a dedicated waste inspection and quarantine facility to inspect and store suspect waste consignments as required;
- Upgrading and ongoing maintenance of established internal haul roads across the application site;
- Temporary stockpiling of topsoil pending re-use as cover material for phased and/or final restoration of the inert landfill / backfilled quarry; and
- Environmental monitoring of noise, dust, surface water and groundwater for the duration of the landfilling and restoration works and C&D waste recovery activities, and for a short period thereafter.

All traffic to and from the proposed waste facility at Ballinclare Quarry will be routed along the L1157 Local Road, amending the previous one-way system that routed inbound traffic along the L1113 Local Road and outbound traffic along the L1157. Following discussions with the Roads Authority, provision is made for road improvements along the length of the L1157 leading up to the quarry access, including road widening to 6.0m over most of the route length (within the existing road curtilage), with road strengthening and repair overlay and road markings. The proposed road improvement works are not anticipated to require the removal of any trees along this route.

As the inert soil and stone to be imported and used for quarry landfilling and restoration purposes is classified as waste, the size and scale of the proposed activity is such that it will also require a waste licence from the Environmental Protection Agency (EPA). The proposed landfilling activity is technically classed by national and European waste management legislation as '*deposit onto land*' and the associate development as a '*waste disposal facility*'.

The size and scale of the proposed C&D waste recovery activities are also such as to require an EPA waste licence. The C&D waste recovery activities are technically classified as '*recycling and reclamation of other inorganic materials which includes ……recycling of inorganic construction materials'*.

The Strategic Infrastructure application is made in accordance with the requirements of Section 37 of the Planning and Development Acts 2000-2018 (as amended) and its attendant regulations. The associated waste licence application is made in accordance with the requirements of the Waste Management Acts 1996-2017 (as amended) and its attendant regulations.

1.2 The Applicant

The Applicant, Kilsaran Concrete was founded in 1964 and is a wholly Irish-owned company, whose principal business is the production of materials for the construction industry. The company manufactures paving and walling, pre-mixed dry products, ready-mix concrete, concrete blocks, trowel-ready mortar, aggregates, asphalt and macadam, hard core and fill materials for the Irish and UK markets. It also undertakes surfacing contracts for road construction and civil engineering works.

The company employs over 600 people directly. It operates twelve hard rock quarries and a similar number of sand and gravel pits. Kilsaran manufactures concrete construction products at 20 locations, principally in the east, midlands and south of the country. The company also has three asphalt plants located strategically at quarry sites throughout its operational area.

Although Kilsaran's principal business interest is in mineral extraction and manufacture of building materials and products, in recent years, it has made beneficial use of excess soil and stone waste generated by construction projects to backfill a number of its larger worked-out pits and quarries under the waste licensing and permitting regimes.

1.3 Application Site

The application site and Kilsaran property holding at Ballinclare Quarry straddle two townlands, Ballinclare and Carrigmore. The application site lies approximately 2.5km to the north-west of a small settlement at Kilbride, Co. Wicklow and approximately 2.5km south of the village of Glenealy. The site location is indicated on an extract from the 1:50,00 Discovery Series Map of the Area in Figure NTS-1 and on a 1:10,000 scale Ordnance Survey plan of the area in Figure NTS-2.

The overall landownership area is c.36 ha (89 acres), while the application site covers approximately 32.5ha (78.3 acres). The application site extends across all of the former quarry footprint and includes the former concrete / asphalt production area, a recently constructed paved concrete block yard, established site buildings and infrastructure and a network of settling ponds in the western apart of the site. It excludes a compound / yard area leased to Wicklow County Council in the north-western corner of the landholding. Permission for quarrying of rock at the quarry was previously granted under Planning Ref. 14/2118. The existing site layout is shown in Figure NTS-3.

1.4 Background to Proposed Development

Ballinclare Quarry is owned, and was previously operated by Kilsaran up to June 2016, when it was discovered that small quantities of naturally occurring asbestos (NOA) were present in the diorite bedrock that was being quarried. Following quarry closure, SLR Consulting Ireland was appointed to examined the feasibility of a range of backfilling and restoration options at the quarry, having regard to the availability of materials, available intake capacity at other waste facilities, market entry and establishment costs (and water treatment costs in particular).

Arising out of this review, Kilsaran elected to backfill the quarry by way of an inert waste landfill with the installation of a clay lining system at its base and sides in order to protect groundwater in the surrounding aquifer. The diorite bedrock at Ballinclare Quarry is classified by the Geological Survey of Ireland (GSI) as a '*poor aquifer (Pl) which is unproductive except in local zones*'. Guidance published by the GSI suggests that this hydrogeological setting is suitable for landfill development.

1.5 Site Access

Traffic travelling to the application site principally travels to Junction 18 of the M11 Motorway between Dublin and Wexford (beside the Beehive Inn) and travels south-west from there for approximately 3.8km along the L1113 Local Road to Ballinclare Quarry. Thereafter, traffic turns left at a T-junction and travels for a further 0.6km along the L1157 local road to the entrance to Ballinclare Quarry.

Alternatively traffic travelling along the R772 Regional Road (the former N11 National Primary Road) can turn off at the Tap Café / Restaurant at Kilbride and travel north-westwards for approximately 2km along the L1157 local road to the entrance to Ballinclare Quarry.

1.6 Site Drainage

When it was operating, the quarry at Ballinclare was effectively worked dry, with very little inflow of groundwater recorded into the quarry void. A sump was located at the lowest point on the quarry floor and collected any surface water falling over the excavation area as well as any minor inflows of groundwater which may have arisen. The water collecting in the sump was periodically pumped to water storage tanks for subsequent re-use in concrete production on-site or for dust suppression.

Any surplus water arising at the quarry void was pumped off-site through a number of settlement ponds before being discharged off-site to a drainage channel which falls to the Ballinclare Stream immediately beyond the north-western site boundary. Approximately 400m north and downstream of the discharge point, the Ballinclare Stream flows into the much larger Potters River.

Since extraction and production activities ceased in 2016, the floor of the quarry has been flooded with surface water run-off and groundwater ingress. The volume of water in the quarry void at the present time is estimated to be of the order of 270,000m^3.

The most recent discharge licence in respect of the existing quarry development (WPL 116, issued by Wicklow County Council on 1 November 2019) provides for the pumping, treatment and off-site discharge of any surface water or deterred groundwater water which collects in the quarry sump. The approved water treatment system (which is yet to be installed) comprises a bespoke Siltbuster treatment system and is necessary to treat naturally elevated levels of arsenic in the water collecting in the quarry void. As well as reducing arsenic concentrations, the unit also removes suspended solids from the water.

1.7 Surrounding Land Use

The area surrounding the application site at Ballinclare Quarry is typically rural in character and dominated by forestry and undulating agricultural land. Ground level in the vicinity of the application site generally lies between 60mOD and 70mOD. Ground levels rise in a south-westerly direction to c.270mOD at Westaston Hill (approximately 2km SW) and in a northerly direction to 217mOD at Ballincooley Hill (approximately 1.75km N).

Potters River flows approximately 450m beyond the northern boundary of the application site and then turns south-eastwards and flows approximately 250m to the east of the landholding. Thereafter it continues south-eastward and eventually discharges to the sea at Brittas Bay.

Residential property in the vicinity of the application site generally comprises farmsteads and isolated / one off houses along the local road network. The nearest dwellings to the landholding boundary are those located to the south, west and north of the site, along the local county road network.

There is another quarry located in Kilmacurra West, on the opposite side of the L1157 Local Road. It is understood that this quarry is not currently active.

The principal tourism / amenity facility in the vicinity of the quarry is the Kilmacurragh Botanic Gardens, an outpost of the National Botanic Garden in Glasnevin, Dublin, which is located just under 1km to the south-west of the site.

There are no designated nature conservation sites (Special Area of Conservation (SAC), Special Protection Area (SPA), Natural Heritage Area (NHA) or proposed Natural Heritage area (pNHA) within or adjacent to the application site. The closest such sites are the Deputy's Pass Nature Reserve SAC (Site Code 000717) and the Glenealy Woods pNHA (Site Code 001756), which, at their closest point are

located approximately 1.6 km and 1.1km to the north-west of the application site respectively. The next closest site is the Buckroney-Brittas Dunes and Fen SAC (Site Code 000729) some 7km southeast of the application site.

There are no recorded monuments located within or immediately adjacent to the application site. The nearest recorded monument is located approximately 300m to the west, in a nearby agricultural field and is identified as a church, holy well and graveyard (Ref. WI030-014). While there is now no physical trace of it, the local 25 inch historical map identifies it as the site of Kilmanoge Church.

There are no structures identified on the National Inventory of Architectural Heritage within or in the immediate vicinity of the application site. There nearest protected structures in the local area are

(i) Westaston Demesne Country House (Structure No. 30-18) is a late-17th Century house which now in ruins, located approximately 0.9km to the south-west of the application area

(ii) Coolacork Country House (Structure No. 31-06), a late 18th Century house located approximately 0.95km to the north-east.

There is a further cluster of protected structures located around the townland of Ballymurrin Lower, approximately 1.5km to the east of the application site (and to the east of the M11 Motorway).

According to the current Wicklow County Development Plan 2016-2022, the application site is located within a landscape sensitivity area identified as a "Corridor Area". This area is described as "*comprising lands either side of the main transport routes within the County, the N11 and N81*". The landscape around the site is further categorised as being of 'medium vulnerability'. At the present time, almost all external views into the application site are screened by existing dense roadside vegetation around the site boundary and by further intervening vegetation within the site itself.

The online Irish Geological Heritage map indicates that Kilmacurra Quarry on the western side of the L1157 Local Road is designated a County Geological Site (CGS). The quarry, which is currently partially flooded is located approximately 700m to the south west of the application site. There are no other designated geological sites in the immediate vicinity.

Details of natural features, established land-use and development surrounding the application site at Ballinclare Quarry are shown on Figure NTS-4.

1.8 Alternatives

The proposed establishment and operation of an inert waste facility at Ballinclare Quarry offers clear environmental and economic advantages relative to other locations and/or greenfield sites. Although they may differ slightly in their nature, scale and duration, the environmental impacts arising from the proposed landfill and C&D waste recovery activities at the application site will essentially be similar to those which previously arose when aggregates were being extracted (specifically in respect of dust and noise emissions, potential impacts on groundwater and traffic related impacts).

Subject to implementation of best environmental management practices and compliance with appropriate planning and licensing controls (i.e. planning conditions and standard emission limit values), the operation of an inert waste facility at this location is considered to be more appropriate, more sustainable and less likely to generate significant impacts than a similar facility at other alternative locations.

2.0 DESCRIPTION OF THE DEVELOPMENT

2.1 General

Kilsaran proposes to backfill the quarry at Ballinclare to surrounding ground level by importing and landfilling inert waste and restoring the backfilled lands thereafter to long-term / scrub habitat. The inert wastes to be imported and landfilled will principally comprise naturally occurring soil, stone and broken rock excavated in the course of construction projects, with some occasional construction and demolition (C&D) waste being imported and used in the construction of internal haul roads across the backfill area. All imported waste accepted at the facility will comply with the waste acceptance criteria (WAC) for inert landfills set by Council Decision 2003/33/EC[1].

As part of the development, suitable uncontaminated natural, undisturbed non-waste soils (classified as a by-product[2]) which conforms to an engineering specification will be imported for re-use in the construction of the basal and side clay liners required for the inert landfill. The clayey soils used in liner construction have relatively low permeability and will restrict groundwater flow out of the backfilled quarry, thereby protecting groundwater quality in the surrounding environment from any potential adverse impact.

The landfill development and backfilling of the quarry void will be undertaken on a phased basis, working progressively from west to east. Restoration of the final landform will also be undertaken on an ongoing, progressive basis and will entail placement of cover soils and seeding to establish a grassland / scrub habitat.

Uncontaminated topsoil waste and/or topsoil by-product will also be imported for the ongoing phased restoration and final restoration works and will be temporarily stockpiled at the landfill facility pending its re-use as cover material during restoration works.

The proposed development also provides for the establishment and operation of a construction and demolition (C&D) waste recovery facility across the footprint of the existing concrete blockyard and soil washing at the former concrete / asphalt production yard to produce recycled aggregates. The principal wastes to be recycled (crushed and screened) at the C&D facility will include concrete (ready-mixed, reinforced, blocks and/or pavement slabs), bricks and bituminous mixtures (hardened asphalt returns and road planings). The principal wastes to be recovered at the soil washing plant will comprise naturally stony / granular clays and claybound C&D waste. The recovered aggregates will be supplied by the Applicant to market or will be used in the production of construction materials (eg. concrete) at its other operating locations.

The backfilling and restoration of the quarry through importation and landfilling of inert waste is designated a waste activity under national and European waste management legislation. The proposed waste activities are technically classified as '*deposit into or on to land*', '*specially engineered landfill*' and '*recycling / reclamation of other inorganic materials*' under the regulations. The scale of the proposed landfilling operations and the planned annual rate of construction and demolition waste recovery are such as to require a waste licence from the Environmental Protection Agency (EPA).

2.2 Site Infrastructure

Much of the infrastructure required to service the proposed inert waste management facility is already in place at the application site and includes site / weighbridge office, staff welfare facilities, wastewater

[1] Council Decision 2003/33/EC of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC

[2] Notified to the Environmental Protection Agency (EPA) under Article 27 of the European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011)

treatment system, outbound weighbridge, garage / workshop, wheelwash, hardstand areas, fuel and water storage tanks to service the proposed development.

The proposed development provides for the installation of a new (additional) weighbridge along the inbound lane of the access road and for re-use of an existing storage shed as a dedicated waste inspection and quarantine facility to store any suspect waste consignments which may be delivered to the facility.

It also provides for construction of a dedicated shed to facilitate the crushing, screening of C&D waste to produce recycled (secondary) aggregates and the set-up of a soil washing plant to extract sand and gravel aggregate from claybound soils / construction wastes.

The proposed site layout when all proposed waste management facilities are established and fully operational is shown in Figure NTS-5.

2.2.1 Proposed C&D Waste Recovery Shed

It is proposed to construct a large, roofed portal frame structure, open on two sides at the existing paved concrete (former blockyard) area to the west of the site access road, as indicated in the site layout plan in Figure NTS-5. The shed will have a plan footprint area of approximately 42m long by 36m wide with a maximum height at the roof apex of 12m. All C&D waste recovery activities take place within the structure in order to reduce potential noise and dust emissions.

Surface water run-off from the shed roof and the existing paved concrete slab will be collected by surface water drains and/or channels around the perimeter of the slab and transferred across to the proposed on-site (passive) wetland treatment system to remove any potential sediment and treat any potential contaminants in the run-off.

2.2.2 Soil Washing / Aggregate Recovery Plant

At the outset of the project, a soil washing plant will be set up and commissioned in the former concrete / asphalt production yard in the south-eastern corner of the application site. This plant will effectively recover sand and gravel aggregate from selected, more granular soil waste and claybound C&D waste imported to the facility. The proposed location and configuration of the soil screening / aggregate recovery plant is shown in the site layout plan in Figure NTS-5.

The soil washing plant comprises a loading hopper, a number of soil screens in series with connecting conveyor systems, a primary wastewater treatment tank (thickener), a buffer tank holding sludge and recycled water, an elevated plate press and filter cake discharge area.

There will be no surface water / groundwater emissions or off-site discharges arising from the proposed soil washing and aggregate recovery activities as all process water will be re-circulated within a closed loop system. As such, there is therefore no requirement to make provision for treatment for any process water associated with the activity. It is likely that occasional water top-ups will be required for the plant and if so, these will be provided from the existing water storage tanks.

All elements of the washing plant are either mobile or largely self-standing and can be readily lifted into place, assembled in-situ and relocated / removed as required. Most of the plant will be supported on the existing concrete slab across the former production yard or on thickened foundations where required.

2.3 Site Access

Under the current planning permission (Planning Ref 14/2118), HGV's travelling to and from Ballinclare Quarry are directed to use a dedicated one-way haul route. HGV's approaching the quarry from M11 Junction 18 (at the Beehive Inn) travel approximately 4km along the L1113 Local Road, then turn left onto the L1157 Local Road and travel a further 600m up to the junction with the existing quarry access

road. Traffic departing the quarry turns left and travels along the L1157 for approximately 2km, up to its junction with the R772 Regional Road (the former N11 National Primary Road) at the Tap Restaurant, and from there proceeds north (or south) to access the M11 Motorway and the National Road network.

As part of the pre-application consultations undertaken with Wicklow County Council (in accordance with the Board direction issued on foot of the Section 37B referral), a walkover survey of the existing local road network around the application site was undertaken and as assessment made of aspects such as road geometry, structural integrity, traffic flows and travel speeds.

Based on these assessments and having regard to local traffic flow characteristics and the changes arising after the M11 motorway opened in 2015, Wicklow County Council advised that it would be preferable to revise the existing long established haul route to the quarry / application site so that HGVs would avoid the L1113 Local Road and would instead travel the shorter distance to and from the R772 Regional Road, in both directions along the L1157 Local Road.

In light of this feedback, this proposal provides for all traffic to and from the proposed integrated inert waste facility at Ballinclare Quarry along the L1157. It also includes provision for a comprehensive road improvement scheme along the length of the L1157 leading up to the application site, including road widening to 6.0m over most of the route length, with road strengthening and repair overlay and road markings.

The majority (>95%) of the HGVs travelling to the proposed waste management facility from the direction of Dublin and North Wicklow will use the M11 Motorway, exiting at Junction 18 and joining the R772 southbound. After travelling south for approximately 4km, traffic heading for the waste facility will turn right from the R772 and onto the L1157 at the ghost island junction near the Tap Restaurant at Kilbride. The access junction to the quarry / waste facility is located along the L1157, approximately 2km north-west of the R772 junction.

It is estimated that less than 5% of HGV traffic will arrive from the direction of Arklow and North Wexford. This traffic will use the M11 Motorway, exiting at Junction 19 to turn onto the R772 Regional Road at Jack Whites Pub. It will then travel north for approximately 5km and turn left, off the R772, and onto the L1157 and continue up to the quarry / waste facility.

Under the proposed revised haul route, all HGV traffic departing the site is required to turn left and follow the upgraded L1157 back to the R772, and from there returns to the motorway network.

2.4 Rate of Importation

It is envisaged that the maximum annual intake of soil and stone / C&D waste at the proposed waste recovery facility at Ballinclare will be of the order of 750,000 tonnes of soil and stone and 50,000 tonnes of construction and demolition (C&D) waste per annum. The combined annual intake of 800,000 tonnes per annum is equivalent to an average of

- 16,000 tonnes per week (assuming 50 weeks in a working year)
- 2,900 tonnes per day (assuming 5.5 days in a working week)
- 290 tonnes per hour (assuming 10 hours in a working day)

If it conservatively assumed that each HGV / truck consignment travelling to the waste recovery facility has a carrying capacity of 20 tonnes, this suggests that at maximum intake rates, there will be on average 14 to 15 HGV / truck trips (or 28 to 30 HGV / truck movements) per hour generated by backfilling / soil waste recovery activity.

The proposed combined rate of waste import (for landfilling and recovery at the C&D facility) will be broadly comparable to the existing / previously permitted limit of 150 HGV trips per day applied to

extractive activities at the quarry. The proposed development will not therefore differ hugely in traffic terms other than to have HGVs fully laden on the way in as opposed to on the way out.

In order to minimise increases in HGV traffic across the existing public road network, all recovered aggregates will be dispatched off-site using a 'backloading' system whereby trucks delivering soil or C&D waste to the Ballinclare facility will pick up a consignment of recycled aggregate before departing the site and will either take it directly to a construction site or to one of the Applicant's concrete production facilities.

2.5 Site Preparation Works

Prior to commencement of the backfilling and recovery activities at the application site, the following site preparation works will be required :

- Securing existing site perimeter with additional fencing / planting as required;
- Dewatering of the quarry void prior to any basal lining / landfilling activities;
- Cutting and mulching of any existing scrub and vegetation across the proposed development footprint and off-site removal to authorised waste facilities (undertaken in phases prior to commencement of works in designated areas);
- Decommissioning and dismantling of any other legacy infrastructure from prior development (eg. production plant, metal, WEEE, additives etc.) and removal off-site to other Kilsaran production sites or authorised waste facilities (as case may be);
- Installation of new weighbridge, reconfiguration of site / weighbridge office and re-establishment of staff welfare facilities and wheelwash facility;
- Minor repair / maintenance / upgrading works to existing bunded fuel storage area and concrete slab with sub-surface drainage to hydrocarbon interceptor and soakaway area;
- (Re-)commissioning of previously approved septic tank and wastewater treatment facilities;
- Excavation, clearance and levelling of existing ground at proposed wetland area and construction of the wetland treatment area;
- Construction of the proposed concrete portal frame structure (open on two sides) at the C&D waste recovery facility;
- Construction / installation of surface water drainage infrastructure between the landfill, recovery shed and C&D waste recovery area and the proposed wetland area;
- Installation and commissioning of the soil washing plant in the former concrete / asphalt yard in the south-eastern corner of the application site;
- Upgrading of internal access roads across the site leading to the waste recovery facility and wetland area;
- Establishment of environmental control and monitoring infrastructure.

2.6 Landfill Design

The landfill at Ballinclare Quarry has been designed to produce a slightly domed landform that falls from the northern side of the site to the south eastern corner and is shown in the final site restoration plan in Figure NTS-6. Corresponding cross-sections are shown in Figure NTS-7. The landfilling works will progress initially from west to east, in Phases 1 through 3, and turn southwards thereafter in Phase 4 to fill over the former processing / production area, as indicated in Figure NTS-8.

The diorite bedrock at Ballinclare Quarry is classified by the Geological Survey of Ireland (GSI) as a '*poor aquifer (Pl) which is unproductive except in local zones*'. GSI mapping also indicates that the quarry is not located within a source protection area for water supplies. Guidance on Groundwater Protection

Responses for Landfills published by the GSI suggests that this hydrogeological setting is generally suitable for landfill development, subject to EPA landfill design guidance and/or conditions attached to a waste licence. EPA guidance requires that the base and sides of inert landfills should be lined with a low permeability clay soil (mineral) layer with a *minimum thickness 1m and a hydraulic conductivity or permeability less than or equal to 1x10^{-7}m/s. It is envisaged that the* basal / side liner at this facility will comprise uncontaminated pre-selected, clayey glacial till (or boulder clay), sourced from construction activities at greenfield sites (which were not previously developed) across the Greater Dublin Region.

The basal liner will have an upper formation level of approximately 38mOD (ie. 1m above the quarry floor). Around the perimeter of the existing quarry, a 2m wide steepwall clay liner will be installed against the face of the quarry. It will be installed progressively upwards from the lined quarry floor as the landfilled waste also progresses upwards. Both the basal and side wall liners will be subject to testing to confirm that it achieves the low target permeability required for an inert landfill.

Currently several stockpiles and a flooded sump (extending locally to approximately 22mOD) are present on the quarry floor. It is envisaged that the flooded sump will remain in place over the initial phases of landfill development. As the landfill activities progress toward this area however, the sump will be progressively backfilled with previously excavated rock in existing stockpiles, other excavated rock / stone across the quarry site, as well as soil imported from external greenfield sites.

The requirements set out by the EPA Guidance for inert landfill sites are that the final restored surface should comprise topsoil and subsoil, thickness, dependent on after use. It has been assumed for conceptual design that 150mm of topsoil over 850mm of subsoil will be used in the final restoration of the completed landform at Ballinclare Quarry.

2.7 Water Management

The former quarry was effectively worked dry with very little inflow of groundwater reported within the void. A quarry sump located at the lowest level on the quarry floor collected any surface water falling over the void area and any minor inflows of groundwater which occurred. This water was recycled and used in concrete production activities and on-site dust suppression, with periodic pumping of water to on-site storage tanks as required.

Since quarrying ceased and management of quarry water was suspended in 2016, the quarry has now partially flooded. To enable the quarry to be re-engineered as a landfill the flooded pit will first need to be emptied of water and discharged via the Ballinclare Stream to the Potters River during the initial site establishment / construction phase. It is envisaged that this will be done under the terms of the existing quarry planning permission and a trade effluent discharge licence recently issued by Wicklow County Council (Ref. WPL116).

Thereafter, a groundwater control system will have to be installed beneath the proposed clay liner system to ensure hydrostatic uplift pressures do not damage the proposed clay liner system. It is envisaged that the drainage system at the base of the quarry / inert landfill will comprise a herringbone system of granular drainage channels beneath the clay line and that these would feed groundwater to a sump at a low point on the quarry floor.

To prevent damage to the clay liner system, groundwater will need to be lowered by pumping from a sump until such time as the depth of inert waste landfilling has reached a level that overcomes the hydrostatic pressure of the surrounding groundwater table. By developing the quarry void from west to east, the existing sump in the quarry floor can be kept in use and maintained for as long as possible. Water collecting in the sump will be pumped to the proposed wetland treatment area by a conventional pump.

Previous experience of operating the quarry is that the surrounding volcanic rock is relatively tight, with relatively limited volumes of groundwater flowing through it. The volume of groundwater likely to collect in the sump is therefore expected to be low, with the bulk of any water removed comprising infiltrating rainfall and/or surface water run-off over or through the landfilled inert waste / soil and stone.

During the operational life of the landfill, the sump will remain open until Phase 3 of landfilling commences, at which point a riser pipe will be installed progressively upwards to allow a submersible pump to access the sump to lift and remove any collected groundwater and infiltrated rainfall or run-off. Pumping will continue until such time that the overlying inert waste has achieved a height where the weight of waste exceeds the maximum uplift pressure from surrounding groundwater. At that point in time, pumping of groundwater may cease and the riser pipe will be decommissioned.

Within the footprint of Phase 4, a surface water lagoon will be formed at the low point of the landfill area and infiltrated rainfall or run-off would be continually pumped until such time as the basal liner is placed across the entire area to facilitate placement of inert waste.

As the site is progressively restored, surface water ditches would be constructed as part of the restoration works to divert surface water run-off away from the backfilled landform, towards treatment ponds / wetland areas on the western boundary.

2.7.1 Water Treatment

The existing approved water treatment system to be installed at Ballinclare Quarry prior to quarry dewatering comprises a bespoke Siltbuster treatment system and is necessary to treat naturally elevated levels of arsenic in the groundwater collecting in the quarry void prior to discharging it off-site to the Potters River via the Ballinclare Stream. As well as reducing arsenic concentrations, the unit will also remove suspended solids from the water. This treatment system will remain in service for the duration of the dewatering activities and for the subsequent landfilling operations.

In waste management, 'leachate' is the term assigned to the slightly contaminated liquid that is generated as influent rainwater and/or groundwater flows through the waste mass, picking up soluble and particulate matter as it moves downward towards the base of the landfill. Landfill leachates have varying compositions that reflect the types of wastes deposited.

There will be on-going generation of leachate from rainfall and groundwater sources over the operational life of a landfill and as a result of the containment provided by the basal and side liners, any leachate needs to be removed and treated prior to being discharged off-site.

Based on past experience, it is likely that the inert waste landfill at Ballinclare will generate leachate that will have little or no ammoniacal nitrogen but could have *potentially* elevated concentrations of sulphate, reduced pH and detectable concentrations of metals. In addition, as excavation soils and C&D wastes can often contain road planings and other materials associated with construction and operation of roads / pavements, some hydrocarbons could also be present.

Leachate may also be generated for a period after landfilling activities have ceased. Once landfilled areas are filled and low permeability soil cover is in place, the infiltration of rainfall and volume of leachate generated will be reduced.

A number of potential leachate treatment and disposal options were considered for the proposed inert landfill and waste recovery facility at Ballinclare. Arising out of this review, it was considered that the most suitable option for leachate treatment would be an on-site (passive) wetland treatment system. When installed in parallel, wetland areas can be independently placed out of service to allow for remediation and replenishment of the infiltration / substrate (soil) media whilst still allowing on-going treatment of leachate through the active bed. Wetland treatment systems have a low visual and

amenity impact and require little on-going intervention once installed. The main drawback which can arise with wetlands is that they require a large footprint area to treat the anticipated input volumes.

As the inert landfill is not currently in existence at Ballinclare Quarry, some initial assumptions have been made about the likely quality of leachate that will be produced by the inert landfill and the volumes that will be generated over time. Worst case scenarios have been considered both in terms of leachate quality (most problematic in terms of composition) and volume (highest generation volume).

An initial assessment indicates that there is sufficient spare land available at Ballinclare for a wetland treatment system in the western site area, adjacent to the planned landfill footprint. It is anticipated that the volumes requiring treatment at the facility will be limited by the progressive restoration of the completed landform over its operational life.

The effectiveness of wetland treatment systems can be enhanced by the temporary addition of various, more active treatment systems, such as chemical dosing, aeration or other such processes. This can allow a wetland system to handle higher contaminant loads or flows for periods of time (should it be necessary) before reverting back to more standard (passive) modes of operation, therefore providing flexibility should leachate generation rates and chemical constituents change over time. Based on the initial assessment and design, the proposed wetland treatment system at Ballinclare Quarry will comprise

(i) Leachate reception tank : up to 50m^3, self-bunded storage tank with level controls.

(ii) Pump house : housed is a standard shipping container (6.0m x 2.4m x 2.6m) containing feed, discharge and chemical dosing pumps;

(iii) Wetland treatment system: comprising the following elements in series
  (a) Anaerobic (biochemical reactor) wetland;
  (b) Iron Sequestering Unit (ISU);
  (c) Aerobic wetland.

(iv) Off-site discharge via existing ditch / drainage channel to Potters River.

Based on the assumption that the leachate flow rate is generated from a progressively capped inert landfill, the area of on-site wetland required at Ballinclare is assessed to be of the order of 3.8 hectares. The location and scale of the proposed wetland treatment area is indicated in Figure NTS-4.

2.8 Waste Activities and Procedures

2.8.1 Waste Intake

The application site will be backfilled using inert waste materials which will principally comprise naturally occurring soil, stone and broken rock excavated in the course of construction and development projects, together with some construction and demolition (C&D) waste complying with the waste acceptance criteria (WAC) for inert landfills set by Council Decision 2003/33/EC.

The former quarry will be backfilled using inert, naturally occurring materials (and some construction and demolition wastes for haul road construction). These wastes will comply with the inert waste acceptance criteria set out in Section 2.1.2 of *Council Decision 2003/33/EC dated 19 December 2002 establishing criteria for the acceptance of waste at landfills*.

Only waste which has been pre-approved for acceptance at the facility will be imported. No peat, contaminated soils or non-hazardous waste will be accepted at the proposed facility.

It is envisaged that the following wastes (with their respective List of Waste (LoW) Codes) will be deposited on land / landfilled at the application site:

- 01 01 02 Waste from mineral non-metalliferous excavations
- 01 04 12 Tailings and other waste from washing and cleaning of minerals
- 01 04 09 Waste sand and clays
- 10 09 06 Casting cores and moulds which have undergone pouring*
- 17 05 04 Soil and stones other than those mentioned in 17 05 03;
- 17 05 06 Dredging spoil other than those mentioned in 17 05 05;
- 17 06 04 Insulation materials*
- 19 09 02 Sludges from water clarification*
- 19 09 04 Spent activated carbon*
- 20 02 02 Soil and stone from municipal facilities.

(* subject to licensing approval by the EPA)

The inert waste landfill will also take soil and stones (LoW Code 17 05 04) which could also be acceptable for intake at (unlined) soil recovery facilities or which may not be acceptable for intake to such facilities for failing to meet any existing or future Waste Acceptance Criteria published by EPA.

Other C&D waste streams accepted for waste recovery in mixed consignments will be segregated during materials recovery and processing at the recovery facility. All segregated wastes will be placed in stockpiles / dedicated bays / skips inside the recovery shed and will be transferred off-site to appropriately authorised waste recovery or disposal facilities. It is envisaged that the following wastes (with their respective List of Waste (LoW) Codes) will be accepted for recovery at the C&D waste recovery facility at the existing paved area:

- 15 01 07 Glass Packaging
- 17 01 01 Concrete
- 17 01 02 Bricks
- 17 01 03 Tiles and Ceramics
- 17 01 07 Mixtures of concrete, bricks, tiles and ceramics
- 17 02 01 Wood
- 17 02 02 Glass
- 17 02 03 Plastic
- 17-03 02 Bituminous mixtures other than those mentioned in 17 03 01
- 17 04 05 Iron and steel
- 19 12 05 Glass from mechanical treatment
- 20 01 02 Glass from municipal waste

2.8.2 Phasing of Landfilling Works

A contour plan showing the final landform for the inert landfill, on completion of final restoration to original ground level is provided in Figure NTS-6. The inert landfill development works will progress sequentially from installation of clay liners along the quarry floor and side walls, landfilling upwards to original ground level, with levelling and restoration of the final landform thereafter. Cross-sections through the completed landfill are presented in Figure NTS-7. .

The works will progress initially from west to east, in Phases 1 through 3, and turn southwards thereafter in Phase 4 to fill over the former processing / production area, as indicated in Figure NTS-8.

Each of the 4 landfill phases will be developed by initially placing a 1m thick layer of low permeability material across the quarry floor to form the basal liner. The liner would not have to cover the whole basal area of any given development phase to allow the placement of inert waste. A minimum area of liner would however have to be determined to ensure that there is sufficient space to allow road trucks and landfill plant to operate.

As the basal area fills with inert waste, the installation of the basal liner would then progress in line with the importation of suitable low permeability materials. Once the basal extent of the phase has been reached, then the installation of the steepwall liner to the walls would be progressed and the open face of the inert waste would be sloped back at a suitable gradient. For the purpose of the phasing drawings, waste slopes of 1v:3h have been assumed.

Such an approach reduces the volume of low permeability clay lining material required to be imported to the facility initially. During the operational life of the facility, the lining system may be installed as suitable clay materials are imported or, alternatively, it could be stockpiled, to be placed on a campaign basis either by site based personnel or by a Contractor.

The area around the existing sand storage shed on the western limit of the application site (which will be re-used as a waste inspection and quarantine shed for the duration of the planned waste activities) will be last to be backfilled and restored.

As indicated on the phasing drawing in Figure NTS-8, by working in this way, it will be possible to provide for progressive restoration of the former quarry void from an early stage in the proposed development. This will improve the landscape and visual characteristics of the site and the early establishment of vegetation will reduce the potential volume of suspended solids carried in surface water run-off.

2.8.3 Processing and Recovery of C&D Wastes

The recovery of C&D waste will be undertaken at the proposed waste recovery shed on an intermittent (or 'campaign') basis, according as waste material accumulates in unprocessed stockpiles and demand for recycled product dictates. Recycling activities will produce a particulate, granular aggregate conforming to standard industry specifications and End-of-Waste criteria set by the EPA and it is envisaged that they will most likely be re-used in road construction or for concrete production.

The size of unprocessed waste stockpiles will therefore vary according to availability of C&D waste, the stage of recycling operations and/or the demand for the finished recycled aggregate product. It is estimated that up to 6 months intake of C&D waste (ie. up to 25,000 tonnes) could be stored at the recovery facility at one time. The external waste stockpile height is likely to be between 6m and 8m high.

Construction and demolition waste held in 'unprocessed' stockpiles is recovered by excavating it using a loading shovel / front–end loader and tipping it into a mobile crusher within the proposed recovery shed in order to produce recycled (secondary) aggregates of varying nominal size.

The recovered / recycled aggregates are then transferred by loading shovel / front-end loader from production stockpiles at the crusher to 'processed' stockpiles at a separate outdoor stockpiling area, also on a hardstand surface. They are then stored on-site pending their subsequent sale and export off-site. As with unprocessed waste, it is estimated that 6 months output of recovered / recycled aggregates (ie. up to 25,000 tonnes) could be stored at the recovery facility at any one time and that it is likely to be of a similar height to that of the unprocessed stockpile (ie. 6m to 8m).

The recovered / recycled (secondary) aggregate is transferred from processed stockpiles to HGVs using a loading shovel / front-end loader on an ongoing, intermittent basis as demand for recycled aggregates dictates.

As all imported waste is required to be sorted and segregated at source, before being brought to the waste recovery facility, it is expected that only minimal sorting of waste materials other than separation of reinforcement from concrete and the removal of occasional inclusions of wood, metal, plastic, etc. will be undertaken at the recycling facility,. Reinforcement (and other physical inclusions) separated from concrete will be stored in skips at the recovery area or transferred to the quarantine facility and then removed off site by an authorised waste collector.

2.8.4 Soil Washing Activities

A proportion of more granular (ie. more sandy / gravelly) soil / claybound C&D intake to the waste facility at Ballinclare will be diverted from disposal at the landfill facility and submitted for recovery at the soil washing plant to be set-up in the south-eastern corner of the application site (at the former concrete / asphalt yard).

Selected soil / claybound waste will be fed by front end loaders from end-tipped stockpiles to the washing plant. Thereafter, the material will be washed and screened. Small stockpiles of sand and gravel aggregate recovered from the washing process will build up at the end of conveyor arms and will be temporarily transferred to larger stockpiles around the former production yard, pending subsequent removal off-site by hauliers and supplied as aggregate or re-used in the production of construction materials.

The estimated throughput at the soil washing plant is likely to be of the order of 150,000 tonnes to 200,000 tonnes per annum. It is estimated that up to 60% of the throughput materials (ie. between 90,000 and 120,000 tonnes per annum) could be recovered for re-use as aggregate with the balance consigned, as pressed filter cake material, for disposal at the adjoining inert landfill facility.

Soil washing activities will continue in operation up to the end of the Phase 3 landfilling activity, at which time the soil washing plant will be decommissioned and removed off site in order to facilitate the final phase of landfilling across the former concrete / asphalt production area. Any associated infrastructure or materials stockpiles will also be removed and the underlying concrete slab broken up for recycling at the adjoining C&D recycling facility.

The waste recycling activities will not generate any additional traffic over and above that generated by the intake of waste / by-product materials as a backloading system will be used to ensure that recycled materials are dispatched to destination sites using outbound HGV's (which would otherwise depart the site without a consignment / load).

2.8.5 Duration of Activities

Assuming a combined total for clay liner / inert waste intake of 6,165,000 tonnes will be required at the landfill facility, that soil and stone waste is imported at an annual maximum intake rate of 750,000 tonnes per annum and that all of it directed to the landfill operation, suggests that the duration of the landfilling operations will be a minimum of 8.2 years.

With the soil washing plant in operation however, the volume of landfilled soil and stone waste will be less than the permitted maximum intake levels. Were the average landfilling rate to average 350,000 tonnes per annum, the duration of backfilling activities could extend to approximately 17.6 years.

It is anticipated that the construction and demolition (C&D) waste recovery (crushing and screening) activities will continue for the duration of landfilling activities at the former quarry void. The rate of C&D waste recovery is not expected to exceed 50,000 tonnes per annum. As previously noted, soil

washing and aggregate recovery activities will cease in advance of the final phase of landfilling across the former concrete / asphalt yard.

2.8.6 Working Hours

It is intended that the weekday operating hours for the proposed development will be the same as those in the planning permission previously granted for quarrying at the application site (Wicklow County Council Planning Ref. 14/2118), between 08:00 hours and 18:00 hours, Monday to Friday

In response to feedback from the public consultation, it is proposed to set working hours on Saturday to between 08.00 hours and 14.00 hours, but to limit waste intake and handling to 10 No. Saturdays in any given year and to only undertake maintenance work on other Saturdays. The facility will be closed on Sundays and Public / Bank Holidays.

2.8.7 Employment

The proposed backfilling operations will require a minimum of four personnel to be based at the facility at all times during working hours.

One individual will be nominated as the facility / site manager and will be required to

(i) check that the soil and stone / C&D waste being imported to the facility for landfilling or recovery has been pre-approved for intake and/or complies with waste acceptance criteria;

(ii) collate and maintain records of waste intake and

(iii) manage the environmental monitoring and reporting programme.

Three further individuals will be required to

(i) be in attendance at the weighbridge office to weigh HGV's in and out for the facility;

(ii) operate the site plant and equipment at the inert landfill facility on a full-time basis (such as a bulldozer or mechanical excavator) as required;

(iii) visually inspect and monitor the suitability of the inert soil and stone waste being accepted and placed at the facility;

(iv) oversee the intake of C&D waste at the waste recovery area on an ongoing basis; and

(v) manage the processing, handling and C&D recovery activities on an intermittent, campaign basis, as required;

(vi) oversee the dispatch of recycled aggregates off-site, to an ultimate end-use which is permitted by EPA End of Waste criteria.

In addition to the full time site-based staff, it is envisaged that operatives and drivers travelling to and from the proposed waste facility will also share the established staff welfare facilities at the site.

2.8.8 Environmental Controls and Monitoring

A number of environmental controls will be implemented during the landfilling and C&D waste recovery operations in order to reduce and minimise potential environmental emissions and any associated nuisance.

The Applicant / Facility Operator will (re-)establish an environmental management programme to monitor and manage environmental emissions arising from the proposed landfilling / C&D waste recovery activities, in line with any requirements in a grant of planning permission and/or EPA waste licence. Pre-existing and/or proposed monitoring locations are identified in Figure NTS-9.

Environmental sampling, monitoring and testing will be undertaken by the Applicant on a regular basis. Records of environmental monitoring and testing will be held on-site and forwarded to the EPA and Wicklow County Council at regular intervals.

2.9 Post Closure Restoration And Aftercare

2.9.1 Inert Landfill Facility

As previously noted, the former quarry void is to be restored to a landform which resembles that which existed prior to development and merges into the surrounding landscape. It is envisaged that the proposed landfill development will entail backfilling and restoring the existing void in a progressive manner, working in phases from west to east (Phases 1 through 3) and turning southwards thereafter(Phase 4) to backfill over the former processing / production area.

As working areas are progressively landfilled to within 1 metre of the final ground level envisaged by the restoration scheme, a cover layer comprising 150mm of topsoil and up to 850mm of subsoil will be placed above the inert soil and stone waste. The soil cover layer will initially be seeded with a grass mix in order to promote stability and minimise soil erosion and dust generation. Some hedgerows will also be planted to re-establish former field boundaries which were lost in order to facilitate the development of the quarry. The proposed final landform contours and planting scheme is indicated in the long term restoration plan in Figure NTS-6.

On completion, it is expected that the backfilled quarry lands will be passively managed and that they will likely return to a long-term grassland / scrub habitat similar to that which existed prior to quarrying.

Topsoil and subsoil will be imported to the site on a continual basis and shall not be used immediately in landfilling / restoring the former quarry. The topsoil and subsoil shall be stockpiled separately within the former quarry footprint, away from the active landfilling area and in such location and manner as not to create any temporary adverse visual impact or dust nuisance. These materials will then be used on an ongoing basis in the progressive restoration of the former quarry, as the upper surface of the landfill body approaches the proposed final ground level.

On completion, any rainfall over the landfill footprint will either

(i) percolate directly into the backfilled soil mass (depending on the permeability and/or degree of saturation of the soil at the ground surface);

(ii) run-off over the ground surface to be collected by surface water channels which will carry it to the wetland area (and/or separate settlement pond, if required) on the western side of the application site, from whence it will be discharged off-site to the Ballinclare Stream and Potter's River.

Locally, in the south eastern corner of the landfill area, the final restored ground levels will be lower than at the discharge point to the Ballinclare Stream and cannot therefore drain to it under gravity. Accordingly, it is envisaged that surface water run-off from this area will collect at a swale / attenuation pond to be constructed close to the south-eastern boundary. Discharge from the swale will be to a minor (unnamed) stream which flows for 300m parallel to the L1157 Local Road and into the Kilmacurragh Stream, which in turn flows into the Potters River approximately 400m further downstream.

The long-term surface water management regime for the backfilled landform, will be established incrementally over time, as landfill and restoration works proceed. On completion of the quarry backfilling and restoration works, any outstanding long-term site drainage works will be completed.

2.9.2 C&D Waste Recovery Facility

On cessation of C&D waste recovery activity at Ballinclare Quarry, any remaining stockpiles of unprocessed C&D waste will be crushed and added to processed waste stockpiles. These stockpiles will in turn be gradually run down as recycled (secondary) aggregate is sold to the market.

The waste recovery shed will be dismantled to ground / foundation level and, insofar as possible, all structural elements (steelwork, wall cladding wall panels etc.) will be recycled and/or recovered. All processing plant and machinery will be removed off-site and any related site infrastructure will also be decommissioned and/or removed off-site as appropriate.

Any paved or hardstanding surfaces around the C&D waste recovery area will be excavated in phases as space is freed up and will be processed / recovered on-site and sold to market. If a residual volume of processed aggregate remains at the end, it will be either be used in final restoration works around the application site or transferred to another C&D waste recovery facility off-site.

As the paved or hardstanding surfaces are excavated and recycled, a replacement cover layer comprising a combined 500mm of topsoil and mineral subsoil will be placed over exposed in-situ soil. This material will most likely be imported (as non-waste) from construction sites.

The upper surface of the reinstated ground around the recovery area will be graded so as to ensure that any surface water run-off falls to drainage channels which will run north-westwards, toward the wetland area. The area will then be seeded with a native grass mix and will evolve to a seasonal grassland / scrub habitat over time, depending on how it is managed.

3.0 EXISTING ENVIRONMENT, EFFECTS AND MITIGATION

3.1 Population and Human Health

Environmental Protection Agency guidelines in relation to Environmental Impact Assessment (2017) indicate that the consideration of human health and population in EIA should address employment, human health and amenity issues. For the purposes of EIA, human health is considered in the light of the relevant topics or 'pathways' addressed by the EIA Report, such as noise, air and water, and in the light of established, acceptable limits for exposure.

The application site is located in County Wicklow and straddles the townlands of Ballinclare and Carrigmore. It is located in the Electoral Division of Dunganstown West. Population centres in the vicinity of the site include the village of Kilbride, approximately 2.5km to the south-east and the village of Glenealy approximately 2.5km to the north. There are several isolated residences and farmsteads located along the local road network around the application site. Existing land use and/or land zoning and residential development in the vicinity of the application site is shown on Figure NTS-4.

The closest social welfare office to the application site is in Wicklow Town. Prior to the Covid 19 epidemic, the number of people on the Live Register in Wicklow had been falling. The 2016 census figures indicate that, of the residents working in Dunganstown West, a significantly higher proportion are employed in skilled trades occupations relative to elsewhere in Wicklow, while a lower proportion are employed in sales / customer services. Local residents are also overrepresented in the agriculture / forestry / fishing sectors and underrepresented in the commerce and trade sector relative to the rest of the County.

It is considered that the proposed development will have a positive effect on employment. During the construction and operational phases, the waste facility will provide employment for a workforce of at least 4 people (on a full time equivalent (FTE) basis). The development will also indirectly support and sustain employment for hauliers in the construction and development industry, as well as providing occasional employment for sub-contractors, maintenance contractors and environmental monitoring personnel and advisors as required. This employment effect will cease once the site is restored.

It is considered that the proposed development is not likely to have significant effects on human health. The main potential pathways for effects on human health arising from waste activities at the application site are noise, dust and groundwater. Measures will be put in place to prevent fugitive dust emissions, to mitigate noise impact, to prevent spillages of fuel and prevent the intake of non-inert, potentially contaminated or suspect wastes which could adversely affect groundwater quality in the underlying (poor) aquifer. With appropriate mitigation measures in place, it is considered that potential adverse health effects are unlikely to occur.

On cessation of landfill and recovery operations, any noise or air quality effects would largely cease once the application site is restored to grassland / agricultural use. Long-term effects on groundwater will be avoided by the inert landfill liner and by implementing precautionary measures around waste intake to the landfill during the operational phase.

The main potential pathways for effects on residential amenity are noise, dust, traffic and landscape. A number of mitigation measures are proposed to control environmental emissions and impacts (and any associated nuisance effect) to ensure that the effects of the proposed development on surrounding residential amenity are acceptable and not significant for the duration of on-site waste disposal / recovery activities.

The traffic assessment prepared in respect of the proposed development concluded that there would be no significant adverse effects arising in respect of the capacity or safety of the local road network.

As part of the proposed development, monitoring will be undertaken in relation to noise, dust, surface water and groundwater. This will measure the actual impact of the development during the site preparation, operational and post closure phases.

3.2 Biodiversity

An Ecological Impact Assessment was undertaken in respect of the proposed development of an inert waste management facility at Ballinclare Quarry. The application site predominantly comprises previously disturbed land, a former quarry used for the extraction of diorite with an extraction void extending to 17.2ha, as well as a former concrete / asphalt production yard, a concrete block yard, established site buildings and infrastructure and a pre-existing water management system, comprising a series of attenuation and settling ponds.

The application site is not subject to any statutory designation and no designated nature site will be directly or indirectly impacted upon by the proposed inert waste management facility. The proposed development will not have any impacts on any Habitats Directive listed Annex I habitats or on Annex II species.

The proposed development will result in the direct loss, damage and disturbance of 17.2ha of existing *Active quarries and mines* habitat (ED4), with the sub-habitat types of *Exposed sand, gravel or till* (ED1), *Recolonising bare ground* (ED3) that in places shows transition to *Dry meadows and grassy verges* habitat (GS2) and *Other artificial lake and ponds* (FL8), *Agricultural grassland* (GA1) and *Wet grassland* (GS4).

Through the provision of appropriate mitigation to ensure the protection of potential breeding birds and the habitat creation for, and translocation of, the common frog and smooth newt during the construction of the proposed wetland area (for water treatment) and the ongoing landfilling and recovery operations, there will be no legal implications for any protected species.

Provided that all appropriate mitigation measures are implemented to ensure compliance with the Wildlife Act 1976 (as amended) in respect to breeding birds, common frog and smooth newt, it is considered that the proposed development and operation of an inert waste management facility at Ballinclare Quarry will comply with the requirements of current national and local planning policies relating to biodiversity.

The proposed restoration of the quarry following its backfilling and final restoration is likely to have a positive and beneficial effect on wildlife and on local biodiversity up to Local (higher) value from current baseline conditions, particularly with regard to the creation of a large area of wetland habitat.

It is assessed that the proposed development will not have a significant adverse impact on the overall biodiversity resource at a local or county level, and may have a positive impact at the local level dependent on the construction and plant species-selection of the water-treatment wetland.

3.3 Land, Soils and Geology

The assessment of the likely environmental impact of the proposed waste disposal and recovery at Ballinclare Quarry on land soil and geology is based on a desk study of the application site and surrounding area involving published geological data, a site walkover of the lands and available ground investigation information, including well installation records.

The application site principally comprises an existing quarry where soil cover and the underlying subsoil have previously been stripped and removed over a significant proportion of the area to facilitate the extraction of the underlying rock and its use in the production of construction materials.

The proposed inert landfilling and waste recovery activities at the application site will be largely confined within the existing development footprint. The proposed constructed wetland area which

will be developed to treat surface water run-off from the inert landfill land and C&D waste recovery facilities will be located in an area in the south-western corner of the application site which currently hosts the existing settlement ponds and an adjoining area of wet and/or improved agricultural grassland.

The Irish Soil Information System (ISIS), identifies the soil association around the application site as the Clonroche Soil Association (ISIS Code 1100a), described as a fine, loamy drift with siliceous stones. These soils are naturally moderately draining and are considered to have good agricultural potential. Soils across much of the application site have previously been stripped and used to construct visual / environmental screening berms around the site perimeter.

Teagasc soil mapping shows the soil, where present in the western part of quarry is classified as AminSW, shallow well drained minerals derived from mainly non-calcareous materials. Any thin soil in the eastern part of quarry is classified as AminSP, shallow poorly drained minerals also derived from mainly non-calcareous materials.

Subsoil mapping at and around the application site indicates that where the underlying subsoils are undisturbed, principally in the south-western area, they comprise glacial till derived from lower Palaeozoic sandstone and shale. There is alluvium mapped along the channel of the Potters River to the north of the application site. As for soil, subsoils have previously been stripped across the quarry footprint and used to construct perimeter screening berms.

The quarry at Ballinclare is entirely developed within a Silurian diorite. The diorite is massive, and contains veins associated with interpreted shear zones. A thin vein of asbestos has previously been exposed at the quarry. The vein exposure has been contained and risks to health have been deemed by the Health and Safety Authority to be acceptable. Karstification does not occur in diorites and no karst features are recorded in the vicinity of the quarry.

Kilmacurra Quarry, c 500m south of Ballinclare quarry is County Geological Site. It is not within the footprint of the proposed development and will not be affected by the development.

A number of mitigation measures will be implemented for the duration of the landfilling and recovery activities to minimise any adverse effects on soils, subsoils and bedrock geology surrounding the application site. These measures will principally be focussed on prevention of potential fuel / oil spills which could arise on site as a result of plant refuelling activities, inadequate plant inspection and/or maintenance, plant or vehicle collisions or poor storage arrangements for hazardous substances etc.

Detailed procedures will also be implemented to minimise the risk of importing and introducing non-inert and potentially contaminated soil / subsoil and C&D waste to the application site. Management systems will be introduced to establish the source of imported materials in advance and to confirm that they are inert. Once accepted at the site a multiple level soil testing regime will be implemented which will test the intake materials for compliance, in line with established EPA practice.

Site activities will be monitored to ensure all landfilled soils are placed at safe slope angles and comply with all relevant Health and Safety legislation and guidance published by the Health and Safety Authority guidelines for the extractive sector, thereby limit the potential for instability / unplanned events.

With the implementation of the proposed mitigation measures, the residual impact on soil and geology arising as a result of the proposed development is deemed to be imperceptible.

In the long term, once the inert landfill activity is complete and the former quarry has been backfilled with inert waste to its original (pre-extraction) ground level, it will be restored to grassland / scrub habitat, and potentially some grassland based agriculture depending on how it is managed, thereby re-establishing its original pre-development land-use within the local area. The long-term impact of the proposed development on land and soils is therefore considered to be beneficial at a local scale.

3.4 Water

This receiving water environment at, and in the immediate vicinity of, the application site at Ballinclare Quarry is characterised on the basis of a preliminary desk study of published information, site visits and inspections, monitoring of groundwater quality and levels and collation and analysis of the information gathered.

In terms of potential adverse impacts on hydrology and hydrogeology, the key elements of the proposed inert waste recovery facility which relate to surface water and groundwater at the site are:

- The placement of imported soil and C&D material on land and its impact on groundwater;
- The off-site discharge of water to the Potters River via the Ballinclare Stream; and
- Surface water drainage / run-off from the site during and following the final restoration.

The soils and subsoils across much of the application site have been removed previously to facilitate the extraction of bedrock. Soil cover was originally thin to absent across the extraction area, with Teagasc / EPA mapping identifying no subsoil present and bedrock occurring at or close to the ground surface. GSI online mapping database shows the area around the quarry to be underlain by the Diorite (Di) Formation consisting of microdiorite to microgranite sills and minor dykes.

The quarry is located entirely within the Ovoca-Vartry Catchment, which is in the Eastern River Basin District. Potter's River flows to the north and east of the application site, approximately 300m from the application boundary at its closest point. The Kilmacurragh Stream flows to the south of the site. Surface water quality in both rivers is currently classified as being of moderate quality and at risk of deteriorating.

Flood mapping published by the Office of Public Works indicates that there is no fluvial (river-related) flood risk arising at the application site from the Potters River. The published maps do however indicate that small areas in the vicinity of the application site may experience pluvial (rain related) flooding after intense rainfall events. In reality, these areas are most likely closed depressions where there is impeded outflow of surface water run-off or areas with delayed recharge to ground.

The diorite bedrock is classified as a poor aquifer (Pl) which is unproductive except in local zones and, in the absence of any protective soil cover, the groundwater vulnerability across the site is classified as being extreme, given that rock occurs at or close to the surface.

The presence of rock close to the surface would usually suggest high infiltration of rainfall to ground and high potential groundwater recharge. However, given the rather low permeability of the diorite bedrock around the application site, there is significant rejection of potential groundwater recharge and most rain falling over the ground surface runs-off to local surface drainage networks (principally ditches / surface water channels). The GSI National Groundwater Recharge Map suggests the maximum recharge capacity at the application site is of the order of 100mm/year.

A site investigation carried out in 2014 provided for the installation of three groundwater monitoring boreholes around the application site. Two rotary core boreholes were also extended on the existing quarry floor to prove the rock type and conditions at depth. Diorite bedrock was ultimately proven to 40m below the quarry floor at the time (to around 0mOD). Only minor groundwater inflows were recorded at most drilling locations, with the exception of one borehole GW2 where near surface drilling intercepted a suspected cavity at 6m depth which gave rise to significant groundwater inflow. There are a number of groundwater supply boreholes located within 1km of the quarry, with poor groundwater yields generally recorded in all boreholes.

Water is supplied to existing toilet, hand washing and welfare facilities from an existing groundwater production well on-site. Drinking water is not sourced from this well however and bottled drinking water is delivered to the site on a regular basis, as required. Wastewater from the site offices and staff

welfare facilities is piped to an existing on-site effluent treatment system which previously approved and installed under the 2014 quarry planning permission.

The baseline study identified the following sensitive hydrological / hydrogeological (water) receptors within the receiving environment:

- Surface Water - Potter's River;
- Groundwater - good quality, poorly productive diorite bedrock aquifer; and
- Groundwater - nearby domestic and agricultural local groundwater supply wells.

The potential adverse impacts on the receiving environment (sensitive receptors) arising as a result of the proposed inert waste facility were assessed and mitigation measures identified in relation to any potential adverse impacts on groundwater and surface water at the construction, operational and post operation stages of the project.

Protection is provided to groundwater by design, through the provision of a basal and side liner at the inert landfill facility. Protection is also provided to surface waters by design, through the construction of the passive wetland treatment area and provision of more active water treatment systems as and if required.

As with the receiving geological environment, mitigation measures will principally focus on preventing potential fuel / oil spills which could arise on site as a result of leakages, spillages and site refuelling activities and minimising the risk of importing and introducing non-inert, potentially contaminated soil / subsoil and C&D materials to the application site.

The one adverse impact which was identified as having a potentially likely, significant effect was on the surface water quality in the Potters River which may result from the presence of potential contaminants in rogue loads of imported material and / or C&D material, adversely impacting leachate / surface water quality. However, with identified mitigation measures in place at the site, it is considered that this potentially significant effect will be reduced to 'not significant'.

In terms of residual impacts, it is considered that with mitigation measures in place at the proposed facility, there are no significant residual impacts with respect to groundwater and/or surface water during the construction, operational or post-construction stages and that the proposed development will not result in any likely, significant effect on groundwater and/or surface water.

A groundwater monitoring programme will be implemented at the application site to confirm that there is no adverse impact on groundwater level or quality over time, as activities proceed. The scope and frequency of groundwater sampling and testing will be set by any EPA waste licence issued in respect of the proposed waste recovery activities. Preliminary monitoring locations are identified in Figure NTS-9.

3.5 Air Quality

The principal air quality impact associated with the operation of the integrated inert waste management facility at Ballinclare Quarry is fugitive dust emission. Dust emissions are likely to arise during dry periods from

- trafficking by HGVs over unpaved soil surfaces;
- end-tipping of soil and stone / inert materials at the landfill facility;
- handling / compaction of inert soil;
- crushing / screening of C&D waste at the recovery area (at the former blockyard)
- wind blow over dry stockpiled materials.

Dust emissions from the soil washing plant are likely to be low emissions due to it being a partially enclosed system and principally involving a wet process.

Given the inert nature of the materials being imported for landfilling / C&D waste recovery purposes and the absence of biodegradable (organic) wastes, no landfill gas emissions will arise from the proposed waste activities at Ballinclare Quarry.

At 4 No residential properties around the application site and an amenity forested area to the north of it, the unmitigated impact of dust emissions is assessed to be slight to moderate adverse. In light of this, and in order to order to control potential dust rise and dust emissions, a number of measures will be implemented at the proposed waste facility, principally

- spraying of water from a tractor drawn bowser on unpaved haul roads and/or exposed soil surfaces and soil / C&D waste stockpiles, particularly during windy periods and/or dry spells;
- placing and compacting soils immediately after being unloaded and minimising the amount of soil being stockpiled (if temporary stockpiling is required, they should be formed against quarry faces, as far as possible from nearby residences);
- planting the upper restored surface with grass as soon as possible after placing cover soil in order to minimise soil erosion and dust emissions.
- restricting the speed of HGVs / articulated trucks within the facility.
- routing all egressing traffic through a wheelwash facility and over the paved section of the access road thereby removing and/or dampening any dust / mud material attaching to the undercarriage and preventing transport of fine particulates off-site, onto the local public road network;
- periodic use of a road sweeper along the public road (if required)
- retaining existing perimeter screening berms and maintaining any planting thereon;

In the unlikely event that future dust monitoring was to indicate that dust emissions are excessive or problematic, consideration could also be given to installing an automated sprinkler system along site roads and/or site boundaries to dampen any lying dust.

With the implementation of the mitigation measures outlined above, the impacts of dust related impacts at the nearest residential properties is reduced to insignificant to acceptable. Following completion of the final site restoration works at the landfill and C&D waste recovery areas, and the return of the application site to grassland and possible agricultural use, there will be no long-term impact on air quality.

The proposed development will have an insignificant dust deposition impact on the Deputy's Pass Nature Reserve SAC and the Glenealy Woods pNHA ecological sites. Traffic levels generated by site waste activities will have negligible impact on local air quality and the site activities will have negligible impact on the concentration of fine particulates (airborne PM_{10}) beyond the development boundary.

An air quality / dust monitoring programme will be implemented at the application site to confirm that waste activities operate within the dust deposition emission limit values set out in any EPA waste licence issued in respect of proposed waste facility. Preliminary monitoring locations are identified in Figure NTS-9.

3.6 Climate

An assessment of potential climate impact has been undertaken having regard to the evolving baseline, climate hazards, project vulnerability and greenhouse gas (principally carbon dioxide, CO_2) emissions. The assessment identified climate change concerns in relation to proposed development, assessed effects and identified mitigation measures where possible. It also had regard to the likelihood and

exposure / vulnerability of the proposed development to climate hazards, both now and in the future, and included a climate hazard impact analysis.

The project is not considered to be particularly vulnerable to climate change events, although some consideration will be given to reducing vulnerability and improving resilience to extreme rainfall events, potential localised flooding, storms and high winds.

Based on the scale and extent of the proposed development / waste activities at Ballinclare Quarry, greenhouse gas emissions are assessed as not significant in context of existing national emission levels. Measures will be implemented to assess and/or monitor greenhouse gas emissions and to reduce these wherever practically possible.

3.7 Noise

Noise monitoring over several months in and around the existing quarry at Ballinclare indicates that average ambient noise levels around the application site typically range between 45dBA L_{Aeq} and 48dBA L_{Aeq}. These noise levels are consistent with daytime levels in rural areas.

Noise predictions undertaken for impact assessment purposes were based on the conservative assumption that all waste activities at the application site are undertaken concurrently and continuously and at the closest point to the landfill footprint. These assessments take account of the noise screening effects of quarry walls, vegetation, perimeter screening mounds and the C&D recycling shed and determined that the cumulative long-term noise impact from the landfilling and C&D waste recovery operations in a worst-case scenario will be *negligible* at all receptors with the exception of one property to the north-west where the potential impact is assessed as *minor.*

Due to the separation distance, the noise impact at Kilmacurragh Arboretum is assessed to be negligible and there will be no impacts on designated nature sites at Glenealy Woods pNHA and at Deputy's Pass Nature Reserve SAC.

A number of further mitigation measures are proposed in line with standard practice at other extractive backfilling / inert landfilling sites to further reduce the potential noise impact of the on-site activities. These include retention and reinforcement of existing perimeter screening banks, maintenance of plant, maintenance of road surfaces, control of traffic speed and unloading activities within the waste facility and ensuring plant is not left running when not in use.

Following completion of the final site restoration works at the landfill and C&D waste recovery areas, and the return of the application site to grassland and possible agricultural use, the long-term impact of the proposed development on ambient noise levels will cease.

A noise monitoring programme will be implemented at the application site to confirm that activities operate within the limit values set out in any EPA waste licence issued in respect of proposed waste recovery activities. Preliminary monitoring locations are identified in Figure NTS-9.

3.8 Material Assets

The Environmental Protection Agency guidelines in relation to environmental impact assessment (2017) indicate that the consideration of material assets in environmental assessment should address built services, roads and traffic and waste management. Traffic is addressed separately and this section principally relates to built infrastructure, services and waste management only.

3.8.1 Infrastructure Assets

The road infrastructure surrounding and servicing the application site is described in Section 1.5 of this Non-Technical Summary. An assessment of likely development impacts on the surrounding road

network concluded that the proposed development will not have a likely significant effect on either traffic safety or the existing capacity of local roads and junctions.

Mitigation measures will be implemented at the application site to ensure that the potential direct impact of landfill / C&D waste recovery activities on the underlying groundwater resource (eg. accidental oil or fuel spills) will be minimised in order to safeguard and protect potential groundwater resources.

3.8.2 Utilities

The proposed landfill and C&D waste recovery activities is not likely to give rise to any short-to-long term impacts on services / utilities. Any electrical power supply to the proposed development will be stepped down from overhead power lines at the existing site based transformer and supplied to site offices / plant as required. Electricity will provide the principal source of energy for office lighting and heating at the facility.

Due regard will be had to the 220kV overhead power lines when landfilling along the eastern site boundary. Standard construction safety practices for working close to the overhead power lines around the facility will be implemented for all site based operations in order to safeguard the health and safety of employees, hauliers and visitors, in line with statutory obligations under health and safety legislation. Such measures will also protect overhead lines from damage by site based activities.

3.8.3 Waste

The proposed landfill and C&D recovery activities at the application site will be operated in accordance with an EPA waste licence, as required under national waste management legislation.

Prior to commencement of the waste disposal / recovery activities, management systems will be established and implemented on-site to control and manage all potential waste streams generated by site activities, to avoid waste generation where possible and to maximise re-use or re-cycling opportunities thereafter.

Any vegetation to be cut and removed off site during the site preparatory works or subsequent operational phases will be managed and brought to an authorised waste recycling facility. General office and food waste produced at the site offices will be minimised insofar as possible. Arrangements will be made for periodic collection of general / recyclable waste by authorised waste contractors and for submission of collected waste for recovery or disposal, as appropriate, at authorised waste facilities.

Waste oils, batteries, domestic waste and scrap metal will be stored on site in designated (bunded) storage areas at the existing workshop and will be collected and recycled or disposed of at authorised off-site waste facilities by authorised waste contractors.

In light of the above, and the limited volume of wastes generated, it is considered that the generation of waste by on-site activities over the period of the inert landfilling, C&D waste recovery and final restoration works will not give rise to any significant short-to-long term effects on land or groundwater quality or on local waste collection / off-site waste management capacity.

3.9 Cultural Heritage

The archaeological and cultural heritage assessment undertaken in respect of the proposed landfilling and C&D waste recovery activities at Ballinclare Quarry comprised a paper / literature review and findings from site visits / fieldwork studies.

The assessment identified a number of features and items of cultural heritage interest and value in the surrounding landscape, although none are known to exist at the application site or immediately

adjacent to it. Two appendices are included in the EIA assessment identify the Recorded Monuments and sites in the Sites and Monuments Record within the study area.

The proposed development will have no direct or indirect impacts on any known items of cultural heritage, archaeology or buildings of heritage interest in the application site or the immediate vicinity thereof.

There are a number of areas within the development footprint which have not been subject to significant previous ground disturbance, principally around the proposed wetland area on the western side of the application site. Due to the possibility of the survival of previously unknown sub-surface archaeological deposits around these areas, any soil stripping associated with future development will be archaeologically monitored at the outset of the development works.

3.10 Landscape

A landscape and visual impact assessment (LVIA) of the proposed landfilling and waste recovery activities at Ballinclare Quarry was completed in accordance with accepted guidance.

The application site covers the footprint of the existing quarry at Ballinclare and comprises the quarry void, former processing/manufacturing areas, old structures and settlement lagoons, as well as boundary and internal screening berms and vegetation. The site is located in the eastern foothills of the Wicklow Mountains, on the southern side of a low hill and south of the Potters River. It is bound to the west and south by local roads and to the north and east by areas of dense woodland / scrub.

The wider landscape is made up of a mix of agricultural land and blocks of deciduous woodland and conifer plantations. The deciduous woodlands are mostly located near the valley floors, while the conifer plantations are more typical on higher elevations and on hill tops. The agricultural land is made up from small to medium sized fields, most of which are under pasture. Almost all field boundaries are marked by dense hedgerows lined with mature trees. The undulating site boundaries and vegetation covered sections of the application site are characteristic of the surrounding landscape.

A Landscape Assessment undertaken as part of the current Wicklow County Development Plan indicates that Ballinclare Quarry is located within the '*Corridor Area*' landscape category and within '*The N11/Eastern Corridor' Landscape Area'*, which comprises a 1-8km wide band following the route of the N11/ M11 between the county boundary with Dublin to the north and Wexford to the south.

The local area is under development pressure due to its proximity to the M11 corridor. The village of Glenealy, approximately 2.5km to the north; Kilbride, approximately 2.5km to the south-east and Barndarrig, approximately 3km also to the southeast are the closest settlements to the application site.

The undulating landscape surrounding the application site, combined with the presence of mature vegetation, significantly reduces its visibility in the surrounding area. All views towards the application site are screened by topography, as well as roadside and intervening vegetation. Dense vegetation along the site boundaries reduces the visibility of the existing quarry to almost zero in views from a close proximity.

The only views of the application site are available from the sloping land to the west and south-west, from elevations above approximately 100mOD. This includes a small number of partial views from Kilmacurragh Botanic Gardens and from short stretches of the local road to the north of Westaston Hill. It should however be noted that roadside and intervening vegetation screens part, if not all, of the existing quarry development, in the majority of views from this area.

The proposed development has been designed to minimise the potential landscape and visual effects. This design included the containment of the development within the existing quarry development footprint and retention of all existing boundary vegetation, which reduces the visibility of the proposed

development from local roads and nearby residential properties significantly. Further to that, the restoration of the landfilled area to grassland / scrub habitat, to include a number of hedgerows, will result in better visual integration of the site into the local landscape, refer to Figure NTS-6.

The components of the proposed development likely to cause landscape effects are:

- changes to the landform within the existing quarry void, due to the backfilling activities;
- changes to the land use and therefore the appearance of the landfilling area, from a mineral extraction use, to a waste management use and finally to grassland / scrub habitat; and
- the introduction of the wetland treatment area and associated change of land use in the western part of the application site.

An assessment of the landscape sensitivity and scale of change associated with the proposed development concluded that the local landscape around the quarry at Ballinclare is able to accommodate the development and that any landscape effects will be minor / negligible and not significant over the operational stage.

As noted, there are distant, restricted views of the application site from elevated locations approximately 1km to 1.5km to the west and south-west (from local roads and Kilmacurragh Arboretum). These views are principally of the upper quarry face and upper landfilling area, generally above the 50mOD contour. The visibility of these areas of the application site and of any site activities above these levels cannot be prevented in the small number of views from elevated locations. HGV movements along the local road network will also be visible to local road users. An assessment of the visual sensitivity of receptors and the scale of change arising during the operational phase of the development concluded that any visual effects will be minor / negligible and not significant.

For both landscape and visual effects, any limited negative effects at operational stage will reduce to none following cessation of the landfilling and recovery activities and the final reinstatement of the application site to its original, pre-development landform.

3.11 Traffic

The existing development footprint at Ballinclare Quarry has a planning permission for quarrying and production of readymix concrete / asphalt / blocks for a period of 25 years from January 2016, subject to 23 conditions (Ref. 14/2118). Condition No.5 of the existing permission limits the export /

Chapter 14 of the EIAR presents an evaluation of the relative level of impact that existing development has on the local road network. Baseline network traffic flows are surveyed with the existing quarry closed. From this baseline the traffic assessment evaluates the potential traffic generation of the existing site and this is compared with the forecast potential traffic arising from the inert waste facility when operating at the planned maximum capacity.

The traffic management proposals and haul implemented previously for extractive related development at Ballinclare Quarry will not apply for the planned inert landfill and C&D waste recovery facility. A maximum of 150 daily HGV movements to and from the quarry site are currently permitted to follow a designated one-way haul route whereby HGVs are routed from the M11 Junction 18 (at the Beehive) anti-clockwise along the L1113, turning onto the L1157, turning into and out of the quarry, continuing along the L1157 to Tap bar / restaurant at Kilbride and then turning back onto the R772 Regional Road (the former N11 National Primary Road) to head north back to M11 Junction 18.

The proposed rate of future waste importation to the inert waste facility will give rise to a volume of HGV traffic that is equal to or less than the existing permitted maximum limit of 150 loads / HGV trips per day. Following consultation with Wicklow County Council and following both joint and independent carriageway condition and traffic flows assessments of the receiving local road network, it was determined that the haul route should be reconfigured to remove the L1113 link and to instead

re-route all traffic to use the 2km section of the L1157 between the existing site access and the R772 former N11 to the east of the site.

Due to the proposed alterations to the haul route the HGV traffic generated by the proposed development will redistribute to the local road network. This benefits the L1113 Coolbeg Road but increases the HGV numbers traveling from the development site two-fold along the proposed revised haul route running both ways along the L1157.

The L1157 will be used for HGVs arriving and departing the site and to accommodate the safe opposed passage of HGV a scheme of road widening and passing areas is proposed. The improvement scheme will improve the condition and serviceability of L1157 and mitigate the impact of the additional traffic load assigned to this section of the local road network.

The design life of the proposed road improvement works is 20 years, equal to or less than the life of the proposed development, so except for routine maintenance works, no additional mitigation measures are considered necessary during the operational stage of the proposed development.

It is not considered likely that the change in traffic flows will give rise to capacity issues on the receiving road network. The level of service and capacity along the L1157 are not considered likely to be significantly affected by the proposed development. There will be no junction capacity issues arising either at the existing site access or at the junction between the L1157 and R772 at the Tap bar / restaurant.

Much of the required site infrastructure, including vehicle washing systems, is already in place for maintaining the adjoining public roadway in a clean state, free from mud and other debris arising from the soil / C&D waste haulage. This infrastructure will continue in operation for the life of the proposed waste facility.

3.12 Interaction of the Foregoing

The interactions of the various potential impacts and mitigation measures have been covered, where applicable, under the relevant sections within the EIAR.

FIGURES

L1113 LOCAL ROAD

L1157 LOCAL ROAD

R772 REGIONAL ROAD

M11 MOTORWAY

N

0 500 1000 1500 2000m 3000 4000 5000

Metres 1:50,000

NOTES

1. EXTRACT FROM ORDNANCE SURVEY 1:50,000 DISCOVERY SERIES MAPPING SHEET NO. 56 & 62

2. ORDNANCE SURVEY IRELAND LICENCE NO. CYAL50167032 (C) ORDNANCE SURVEY IRELAND/ GOVERNMENT OF IRELAND

LEGEND

LANDHOLDING BOUNDARY (c.36 Ha. / 89 acres)

PLANNING APPLICATION AREA (c. 32.5 Ha.)

SLR CONSULTING IRELAND
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN 14
T: +353-1-2964667
F: +353-1-2964676
www.slrconsulting.com

KILSARAN CONCRETE

EIAR NON-TECHNICAL SUMMARY

BALLINCLARE QUARRY RESTORATION
INERT WASTE & C+D WASTE RECOVERY FACILITY
KILBRIDE (N11), CO. WICKLOW

SITE LOCATION MAP

FIGURE NTS 1

Scale 1:50,000 @ A3

Date MARCH 2021

00036.00080.0.16.FIG 1-1.0.Site Location Map.dwg

L1113 LOCAL ROAD

SITE NOTICE LOCATION @ SITE ENTRANCE

L1157 LOCAL ROAD

R772 REGIONAL ROAD

M11 MOTORWAY

N

0 100 200 300 400m 600 800 1000

Metres 1:10,000

NOTES

1. EXTRACT FROM ORDNANCE SURVEY 6 INCH MAPPING WW030 & WW0311

2. ORDNANCE SURVEY IRELAND LICENCE NO. CYAL50167032 (C) ORDNANCE SURVEY IRELAND/ GOVERNMENT OF IRELAND

LEGEND

LANDHOLDING BOUNDARY (c. 36 Ha. / 89 acres)

PLANNING APPLICATION AREA (c. 32.5 Ha.)

SLR CONSULTING IRELAND
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN 14
T: +353-1-2964667
F: +353-1-2964676
www.slrconsulting.com

KILSARAN CONCRETE

EIAR NON-TECHNICAL SUMMARY

BALLINCLARE QUARRY RESTORATION

INERT WASTE & C+D WASTE RECOVERY FACILITY

KILBRIDE (N11), CO. WICKLOW

SITE LOCATION PLAN

FIGURE NTS 2

Scale 1:10,000 @ A3

Date MARCH 2021

00036.00080.0.16.FIG 1-2.0.Site Location Plan.dwg

NOTES

1. EXTRACT FROM ORDNANCE SURVEY 1:2,500 / 1:5,000 MAP SERIES: 4137-B & 4137-D

2. ORDNANCE SURVEY IRELAND LICENCE NO. CYAL50167032 (C) ORDNANCE SURVEY IRELAND/ GOVERNMENT OF IRELAND

3. EXISTING SURVEY (MAY 2016) PROVIDED BY KILSARAN

LEGEND

- LANDHOLDING BOUNDARY (c. 36 Ha. / 89 acres)
- PLANNING APPLICATION AREA (c. 32.5 Ha.)
- PROPOSED INERT LANDFILL AREA (c. 17.0 Ha.)
- CONTOURS
- INTERNAL ACCESS TRACKS
- OVERHEAD LINES

N

CARRIGMORE

WCC COMPOUND

WATER SUPPLY WELL

DISCHARGE CHANNEL

SCREENING BERM

SETTLEMENT LAGOONS

TREATED WATER TO SETTLEMENT PONDS

BACK UP SETTLEMENT LAGOONS (IF REQUIRED)

WATER TREATMENT PLANT

Building

SCREENING BERM

EXISTING FLOOR LEVEL C. 37mOD

CONCRETE YARD

WORKSHOP

CANTEEN

BUNDED FUEL TANKS

TOILETS

PUMPING CHAMBER

WEIGHBRIDGE

SITE OFFICE

CAR PARKING AREA

WHEELWASH

DISTRIBUTION ROOM & CONTROL SWITCH GEAR (AGGREGATE PLANT)

TERTIARY TREATMENT UNIT (2 MODULE PURAFLO)

ESB SUBSTATION & SWITCHROOM

AERATION TREATMENT UNIT

CAR PARKING AREA

LABORATORY

TOILETS

SAND STORAGE SHED

SITE NOTICE LOCATION @ SITE ENTRANCE

QUARRY SUMP

DISCHARGE WATER FROM QUARRY SUMP

A

A'

B

B'

0 80m 200

Metres 1:2500

SLR CONSULTING IRELAND
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN 14
T: +353-1-2964667
F: +353-1-2964676
www.slrconsulting.com

KILSARAN CONCRETE

EIAR NON-TECHNICAL SUMMARY

BALLINCLARE QUARRY RESTORATION & INERT LANDFILL & C+D WASTE RECOVERY FACILITY KILBRIDE (N11), CO. WICKLOW

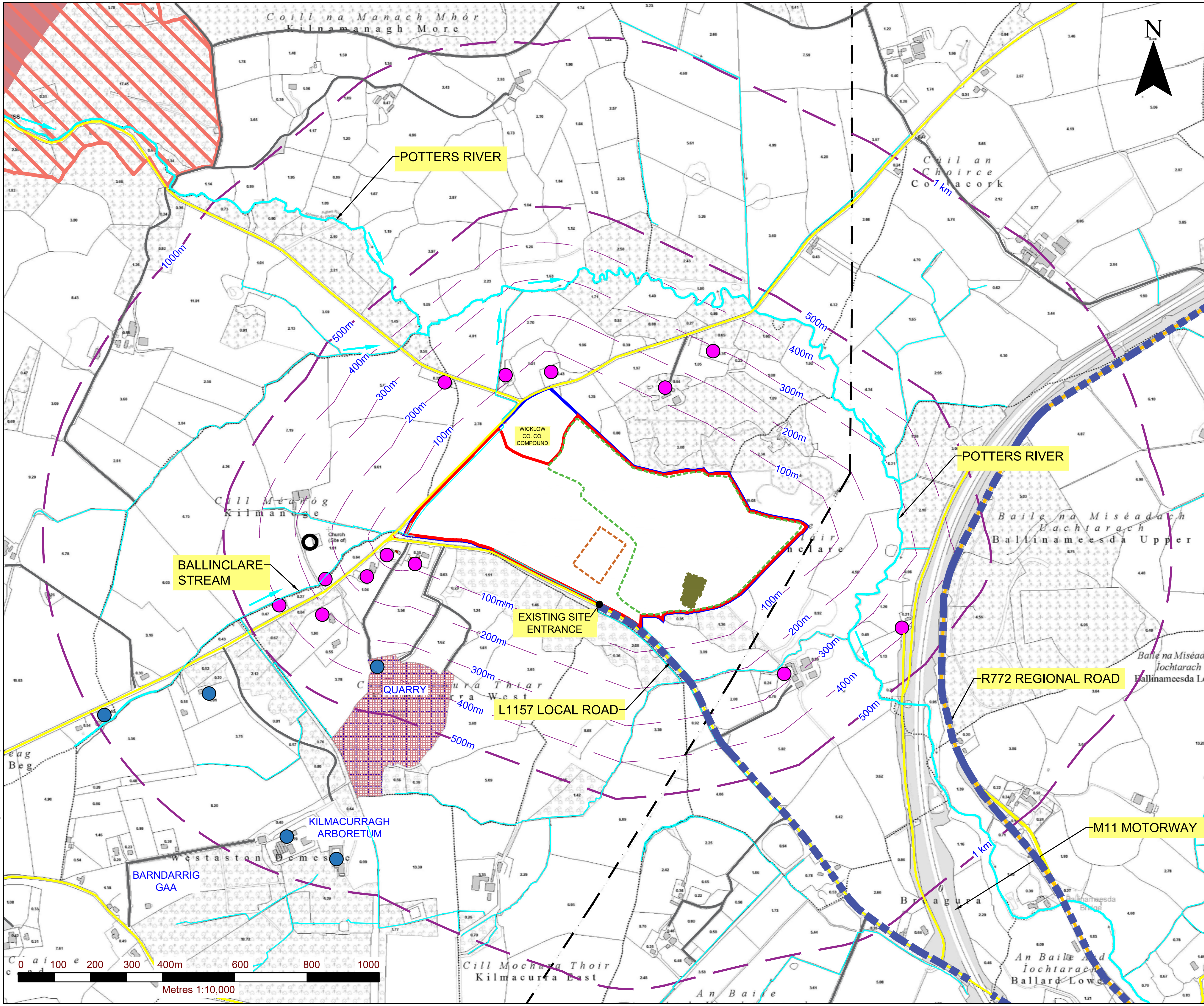
EXISTING SITE LAYOUT

FIGURE NTS 3

Scale 1:2,500 @ A3

Date MARCH 2021

00036.00080.0.16.FIG 2-1.0.Existing Site Layout.dwg



NOTES

1. EXTRACT FROM ORDNANCE SURVEY 6 INCH MAPPING WW030 & WW0311
2. ORDNANCE SURVEY IRELAND LICENCE NO. CYAL50167032 (C) ORDNANCE SURVEY IRELAND/ GOVERNMENT OF IRELAND
3. EXISTING SURVEY (MAY 2016) PROVIDED BY KILSARAN

LEGEND

- LANDHOLDING BOUNDARY (c. 36 Ha. / 89 acres)
- PLANNING APPLICATION AREA (c. 32.5 Ha.)
- INERT WASTE LANDFILL FOOTPRINT (c. 17.0 Ha.)
- C&D WASTE RECOVERY FACILITY AREA
- PROPOSED SOIL WASHING PLANT
- 500m, 1km, 2km & 3km DISTANCE OFFSETS FROM BOUNDARY
- RESIDENTIAL RECEPTORS
- COMMERCIAL RECEPTORS
- 002274 - DEPUTY'S PASS NATURE RESERVE SAC
- 001756 - GLENEALY WOODS pNHA
- R772 REGIONAL ROAD
- LOCAL ROAD NETWORK
- ACCESS TRACKS
- 220kV ELECTRIC OVERHEAD LINE
- RIVER / STREAMS
- HAUL ROUTE

SLR CONSULTING IRELAND
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN 14
T: +353-1-2964667
F: +353-1-2964676
www.slrconsulting.com

KILSARAN CONCRETE

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

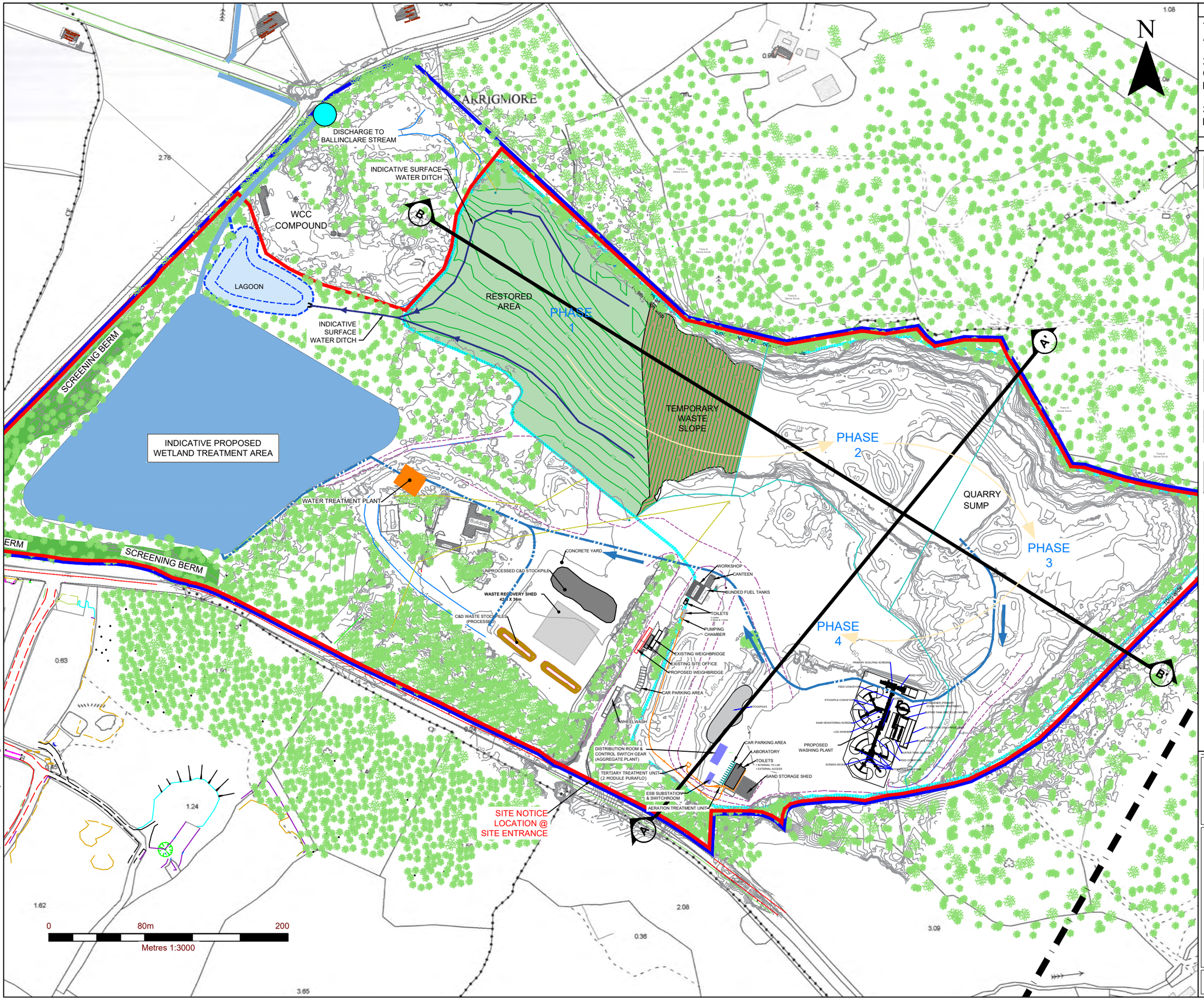
BALLINCLARE QUARRY RESTORATION & INERT WASTE & C+D WASTE RECOVERY FACILITY KILBRIDE (N11), CO. WICKLOW

SURROUNDING LAND USE

FIGURE NTS 4

Scale	Date
1:10,000 @ A3	MARCH 2021

00036.00080.0.16.FIG 1-4.0.Surrounding Land Use.dwg



00036.00080.0.16.FIG 2-2.0.Proposed Site Layout.dwg

NOTES

1. EXTRACT FROM ORDNANCE SURVEY 1:2,500 / 1:5,000 MAP SERIES: 4137-B & 4137-D

2. ORDNANCE SURVEY IRELAND LICENCE NO. CYAL50167032 (C) ORDNANCE SURVEY IRELAND/ GOVERNMENT OF IRELAND

3. EXISTING SURVEY (MAY 2016) PROVIDED BY KILSARAN

LEGEND

- LANDHOLDING BOUNDARY (c. 36 Ha. / 89 acres)
- PLANNING APPLICATION AREA (c. 32.5 Ha.)
- PROPOSED INERT LANDFILL AREA (c. 17.0 Ha.)
- CONTOURS
- INTERNAL ACCESS TRACKS
- OVERHEAD LINES
- 220kV ELECTRIC OVERHEAD LINE
- PROPOSED DISCHARGE POINT
- RESTORED AREA
- PUMPED WASTE WATER FROM SURFACE RUNOFF

SLR CONSULTING IRELAND
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN 14
T: +353-1-2964667
F: +353-1-2964676
www.slrconsulting.com

KILSARAN CONCRETE

EIAR NON-TECHNICAL SUMMARY

BALLINCLARE QUARRY RESTORATION & INERT LANDFILL & C+D WASTE RECOVERY FACILITY KILBRIDE (N11), CO. WICKLOW

PROPOSED SITE LAYOUT

FIGURE NTS 5

Scale	Date
1:3,000 @ A3	MARCH 2021

N

PREVIOUSLY STRIPPED / HARD STANDING AREAS TO BE RESTORED TO AGRICULTURAL GRASSLAND

EXISTING SCRUB/ WOODLAND AREAS TO BE RETAINED

EXISTING SCRUB/ WOODLAND AREAS TO BE RETAINED

EXISTING BOUNDARY HEDGEROWS TO BE RETAINED

LAGOON

INDICATIVE SURFACE WATER DITCH

LANDFILL AREA TO BE RESTORED TO GRASSLAND

EXISTING SCRUB/ WOODLAND AREAS TO BE RETAINED

WETLAND TREATMENT AREA TO BE RETAINED AS A WILDLIFE FEATURE

PROPOSED NATIVE HEDGEROWS

EXISTING SCRUB/ WOODLAND AREAS TO BE RETAINED

LANDFILL AREA TO BE RESTORED TO GRASSLAND

EXISTING SCRUB/ WOODLAND AREAS TO BE RETAINED

EXISTING BOUNDARY HEDGEROWS TO BE RETAINED

C+D FACILITY TO BE REMOVED AND AREA RESTORED TO GRASSLAND

LANDFILL AREA TO BE RESTORED TO GRASSLAND

EXISTING SCRUB/ WOODLAND AREAS TO BE RETAINED

EXISTING SITE ENTRANCE

EXISTING BOUNDARY HEDGEROWS TO BE RETAINED

EXISTING SCRUB/ WOODLAND AREAS TO BE RETAINED

0 80m 200

Metres 1:2500

NATIVE HEDGE MIX

Two rows to be planted at 40cm centres with rows 40cm apart (i.e. 2.5 plants/m; approx. 1,250m in total = 3,125 plants). Transplants to be planted randomly with no more than 3 plants of the same species in one row. Feathered Transplants to be planted approximately every 8m, with a random allocation of alder and oak along the hedge, and to be maintained as hedgerow trees.

No.	Plant Name	Common Name	Height (cm)	Age	%
Transplants/Container Grown Shrubs					
340	Corylus avellana	Hazel	60-90	1+0	20
560	Crataegus monogyna	Hawthorn	60-90	1+1	25
225	Ilex aquifolium	Holly	60-80	2Lt	10
225	Prunus avium	Wild Cherry	60-90	1+0	10
340	Prunus spinosa	Blackthorn	60-90	1+0	20
225	Sambucus nigra	Elder	60-90	1+1	10
Feathered Transplants					
110	Alnus glutinosa	Common alder	175-200	2xTR	2.5
110	Quercus petraea	Sessile oak	175-200	2xTR	2.5

NOTES

LEGEND

- LANDHOLDING BOUNDARY (c. 36 Ha. / 89 acres)
- PLANNING APPLICATION AREA (c. 32.5 Ha.)
- PROPOSED INERT LANDFILL AREA (c. 17.0 Ha.)

RESTORATION MEASURES

- AREAS TO BE RESTORED TO AGRICULTURAL GRASSLAND
- PROPOSED NATIVE HEDGEROWS
- WETLAND TREATMENT AREA TO BE RETAINED AS A WILDLIFE / BIODIVERSITY FEATURE

RESTORATION PROPOSALS

The inert landfill area at Ballinclare, Co. Wicklow will be restored to agricultural grassland, which is one of the beneficial afteruses recommended in the EPA Guidelines 'Environmental Management in the Extractive Industry' (2006).
The restoration will take place on a phased basis, in conjunciton with the phased filling activities. The below restoration elements will be implemented.

Retention of Existing Vegetation: All existing screening vegetation along the site boundaries, and most of the internal woodland areas and scrub vegetation will be retained.

Spreading of soil and grass seeding: The area to be grass seeded will be covered with approximately 350mm of subsoil and 150mm of topsoil on completion of each phase of the landfilling/ re-grading works. The material will be sourced from the material imported into the site, which will be stored in temporary stockpiles. Once the earthworks are complete the area will be grass seeded, using a suitable agricultural grass seed mix.

Hedge Planting: On completion of all earthworks, native hedges will be planted in the approximate locations of former boundary lines, to provide green corridors and break up the large site.

NOTES:

Earthworks: All soil handling to be carried out, as per current best practice guidance. Topsoil and subsoil to be handled separately.

Grass Seeding: Prior to any seeding works surface preparation and final cultivation will be carried out in accordance with current best practice. Seeding to take place whilst suitable weather conditions prevail. The sowing specifications will be as per the manufacturer's instructions.

Planting General: All proposed species are native.
All plants to be protected with spiral guards or alternatively with rabbit proof fencing. All plant handling, planting and establishment works will be carried out in accordance with current best practice and will take place in the appropriate planting season (e.g. bareroot planting: November to March only) and in favourable weather conditions. The planting will be carried out by a suitably qualified landscape contractor.

Aftercare: Establishment maintenance will be carried out for 2 years following each stage of the planting works (minimum 3 maintenance visits per year; i.e. spring, summer and autumn). This will include weed control, replacement planting where required and the adjustment/removal of tree ties and spiral guards.

SLR CONSULTING IRELAND
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN 14
T: +353-1-2964667
F: +353-1-2964676
www.slrconsulting.com

KILSARAN CONCRETE

NON TECHNICAL SUMMARY

BALLINCLARE QUARRY RESTORATION &
INERT LANDFILL & C+D WASTE RECOVERY FACILITY
KILBRIDE (N11), CO. WICKLOW

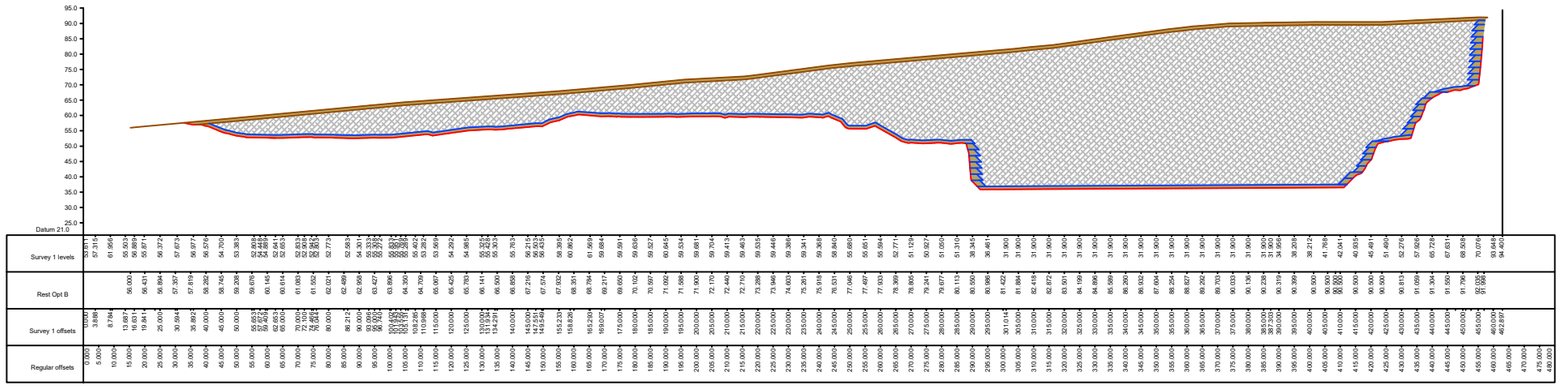
RESTORATION SURFACE AND LANDSCAPING PLAN

FIGURE NTS 6

Scale 1:2,500 @ A3

Date MARCH 2021

00036.00080.0.16.FIG 2-4.0.Restoration Surface and Landscape Plan.dwg



SECTION A

SCALE 1:2000

SECTION B

SCALE 1:2000

LEGEND - SECTIONS

🟩	EXISTING LEVELS
🟥	PROPOSED FORMATION LEVELS
🟫	PROPOSED FINAL RESTORATION LEVELS
🟦	PROPOSED BASAL AND SIDEWALL LINING
▨	ENGINEERED MINERAL LINER
▨	INERT WASTE / SOILS
🟫	RESTORATION SOILS

NOTES

1. EXTRACT FROM ORDNANCE SURVEY 6 INCH MAPPING WW030 & WW0311

2. ORDNANCE SURVEY IRELAND LICENCE NO. CYAL50167032 (C) ORDNANCE SURVEY IRELAND/ GOVERNMENT OF IRELAND

3. EXISTING SURVEY (MAY 2016) PROVIDED BY KILSARAN

PLAN

SCALE 1:5000

LEGEND - PLAN

🟦	LANDHOLDING BOUNDARY (c. 36 Ha. / 89 acres)
🟥	PLANNING APPLICATION AREA (c. 32.5 Ha.)
▨	INERT PROPOSED LANDFILL AREA (c. 17.0 Ha.)

SLR
global environmental solutions

SLR CONSULTING IRELAND
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN 14
T: +353-1-2964667
F: +353-1-2964676
www.slrconsulting.com

KILSARAN CONCRETE

EIAR NON-TECHNICAL SUMMARY

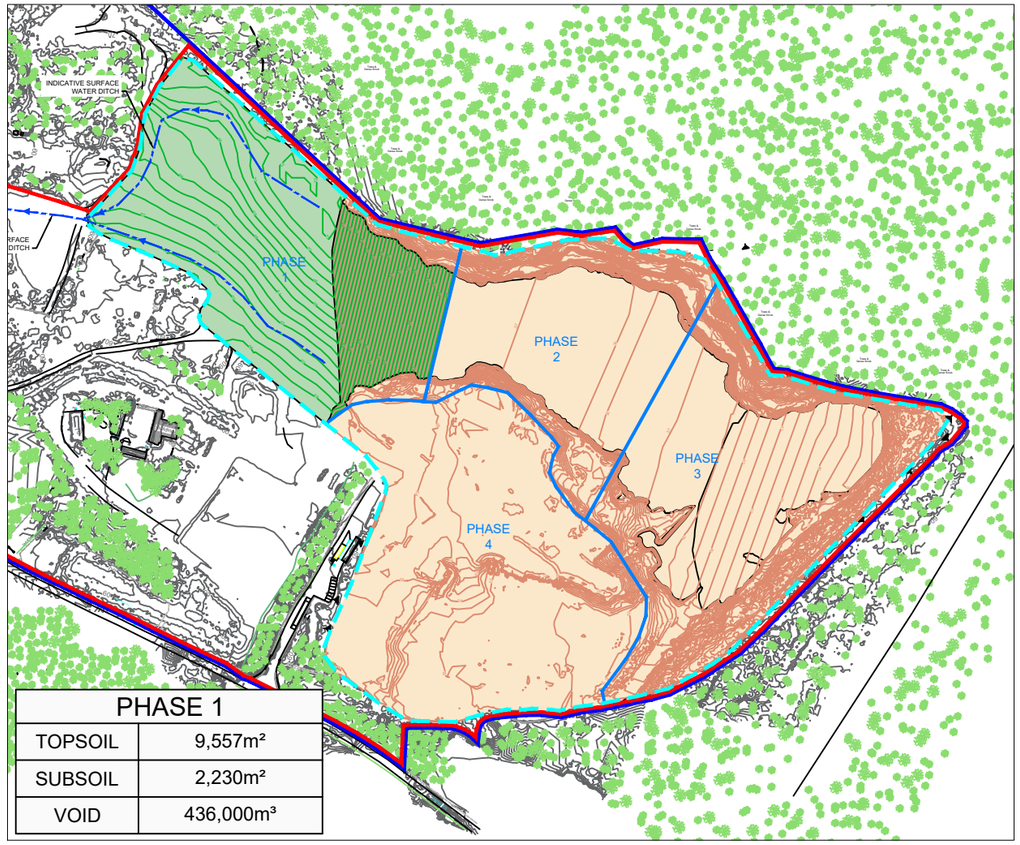
BALLINCLARE QUARRY RESTORATION &
INERT LANDFILL & C+D WASTE RECOVERY FACILITY
KILBRIDE (N11), CO. WICKLOW

RESTORATION / BACKFILLING CROSS SECTIONS

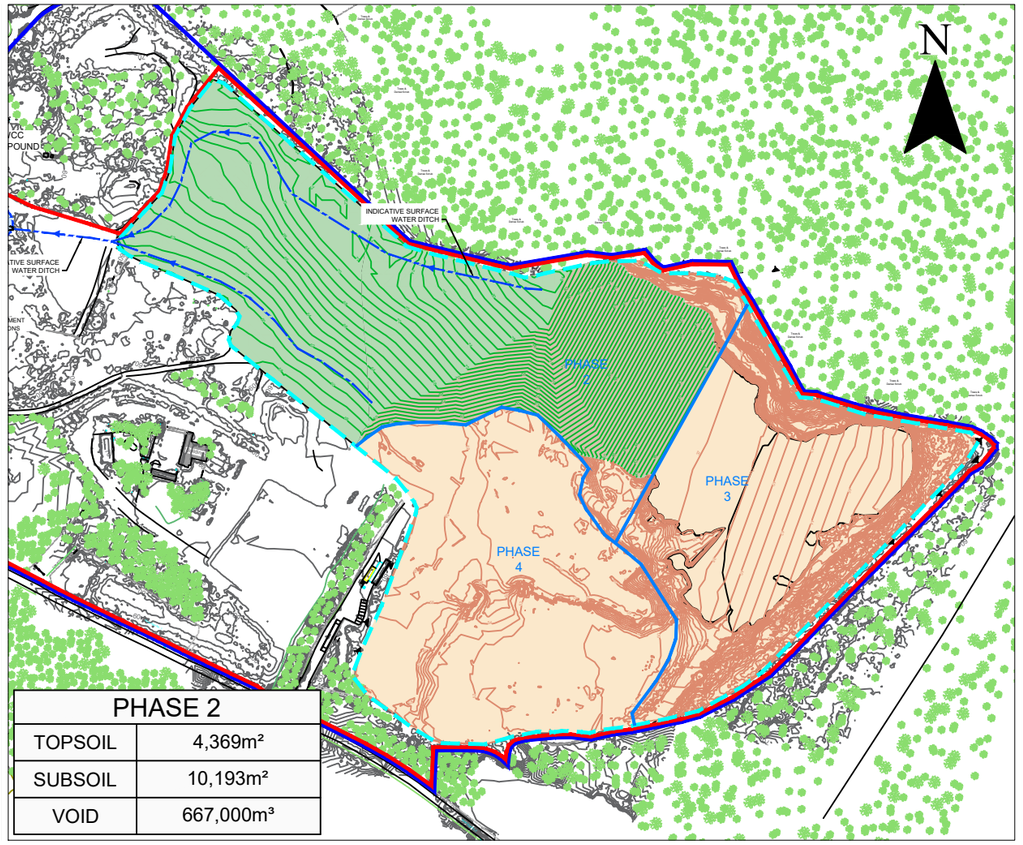
FIGURE NTS 7

Scale	Date
AS SHOWN @ A3	MARCH 2021

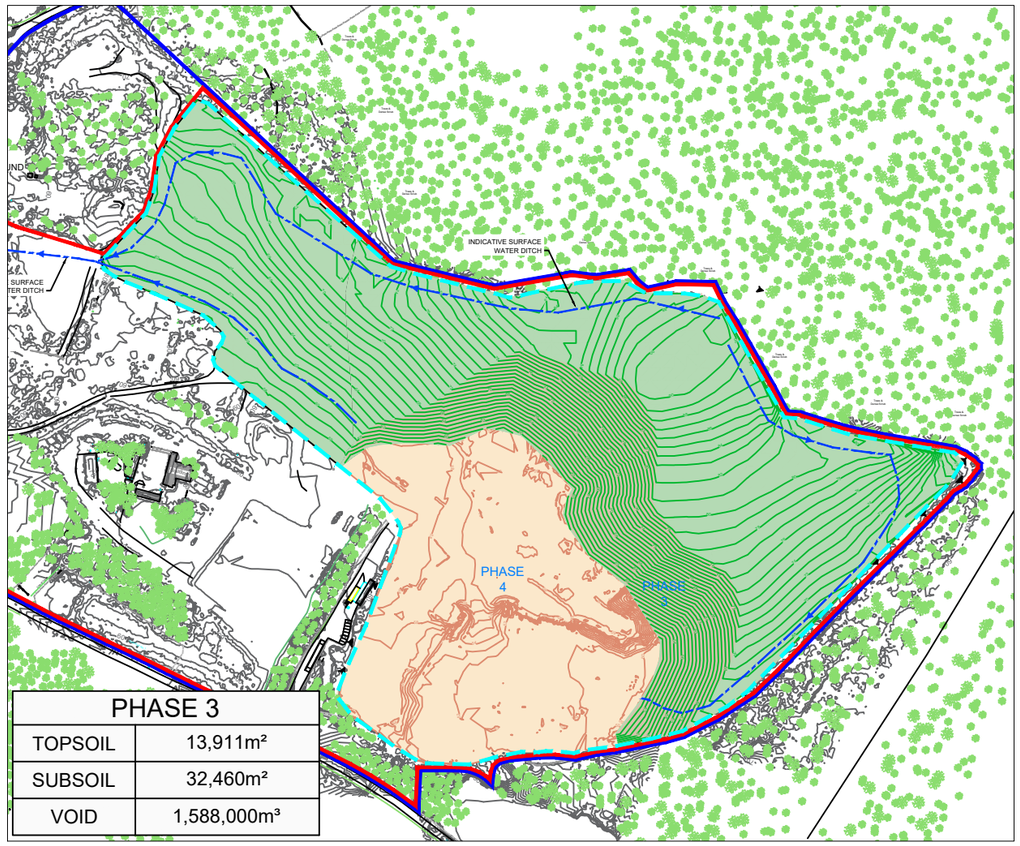
00036.00080.0.16.FIG 2-5.0.Restoration-Backfilling Cross Sections.dwg



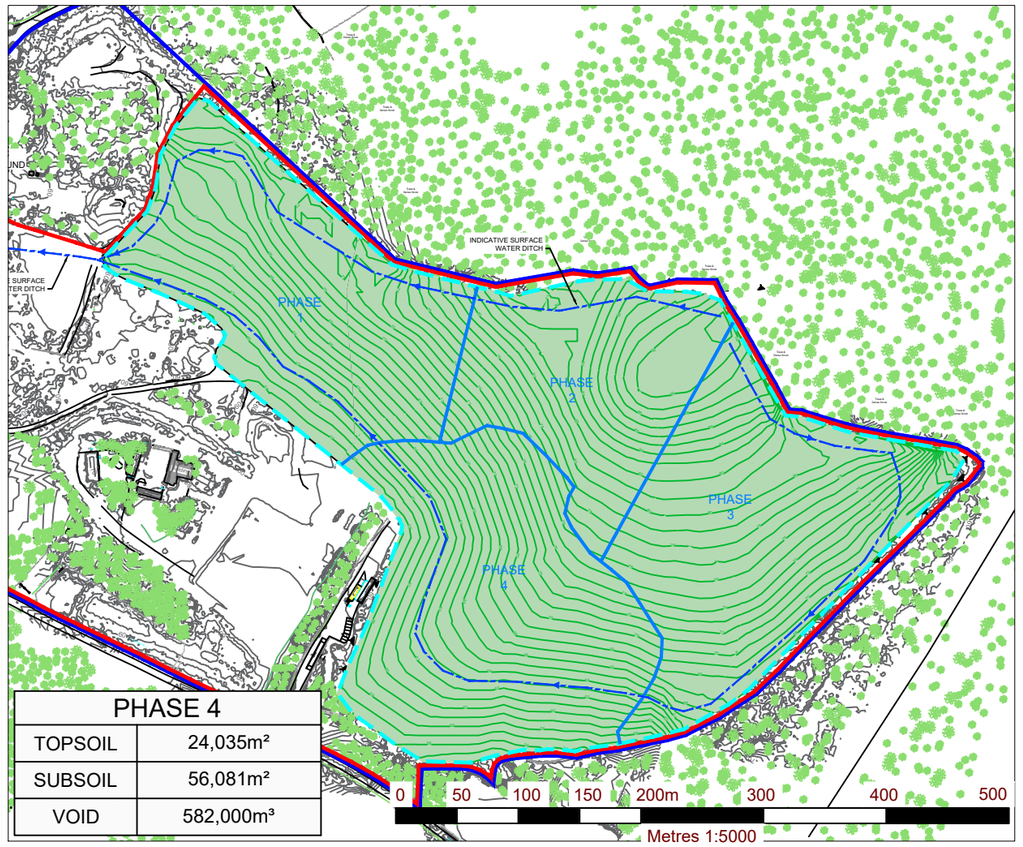
PHASE 1	
TOPSOIL	9,557m²
SUBSOIL	2,230m²
VOID	436,000m³



PHASE 2	
TOPSOIL	4,369m²
SUBSOIL	10,193m²
VOID	667,000m³



PHASE 3	
TOPSOIL	13,911m²
SUBSOIL	32,460m²
VOID	1,588,000m³



PHASE 4	
TOPSOIL	24,035m²
SUBSOIL	56,081m²
VOID	582,000m³

NOTES

1. EXTRACT FROM ORDNANCE SURVEY 6 INCH MAPPING WW030 & WW0311

2. ORDNANCE SURVEY IRELAND LICENCE NO. CYAL50167032 (C) ORDNANCE SURVEY IRELAND/ GOVERNMENT OF IRELAND

3. EXISTING SURVEY (MAY 2016) PROVIDED BY KILSARAN

LEGEND

- LANDHOLDING BOUNDARY (c. 36 Ha. / 89 acres)
- PLANNING APPLICATION AREA (c. 32.5 Ha.)
- PROPOSED INERT LANDFILL AREA (c. 17.0 Ha.)
- PROPOSED FORMATION LEVELS RECOVERY AREA
- RESTORED AREA
- TEMPORARY WASTE SLOPE

SLR CONSULTING IRELAND
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN 14
T: +353-1-2964667
F: +353-1-2964676
www.slrconsulting.com

KILSARAN CONCRETE

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

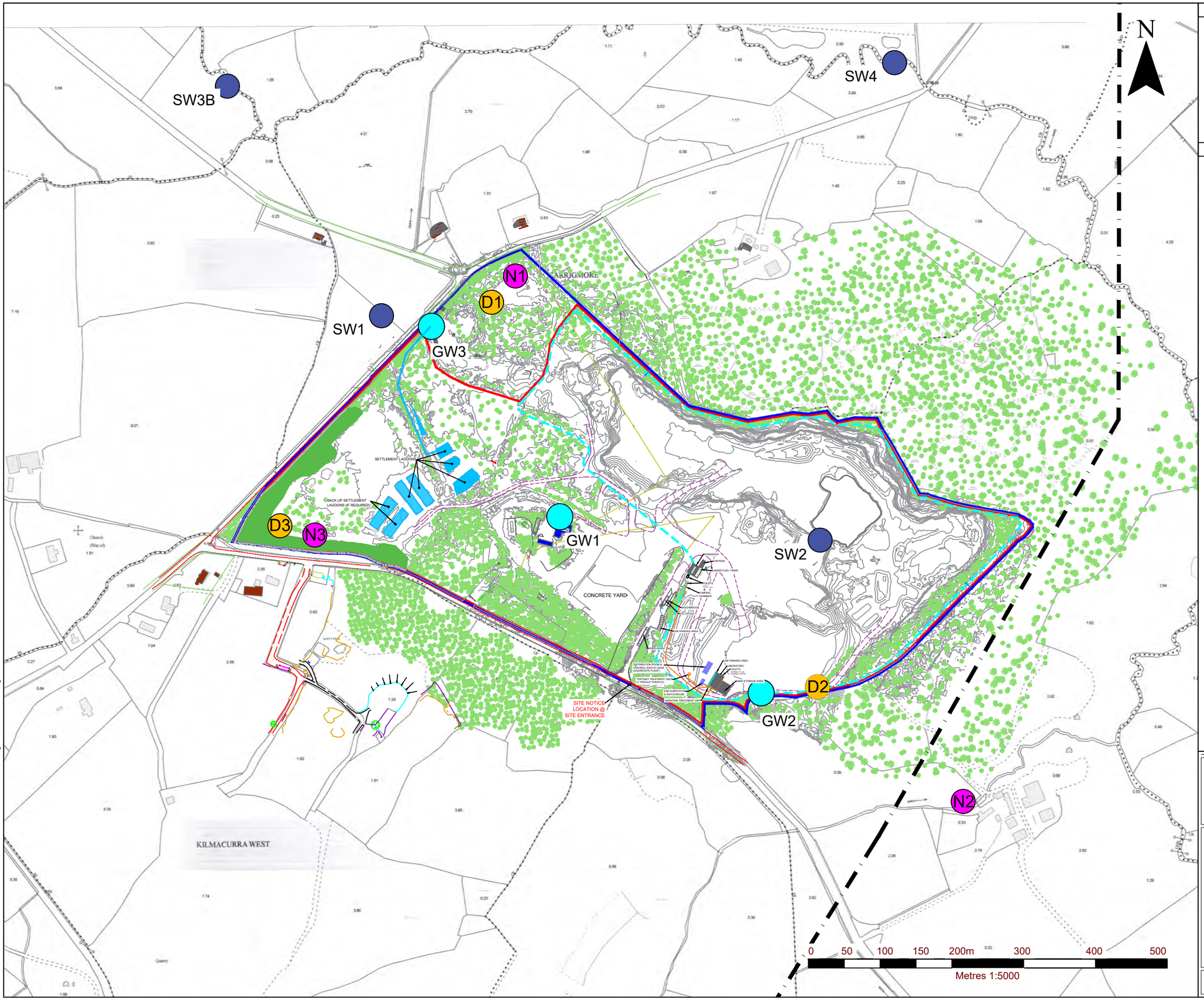
BALLINCLARE QUARRY RESTORATION
INERT LANDFILL & C+D WASTE RECOVERY FACILITY
KILBRIDE (N11), CO. WICKLOW

LANDFILL PHASING PLAN

FIGURE NTS 8

Scale	Date
1:5,000 @ A3	MARCH 2021

00036.00080.0.16.FIG 2-11.0.Landfill Phasing Plan.dwg



NOTES

1. EXTRACT FROM ORDNANCE SURVEY 6 INCH MAPPING WW030 & WW0311

2. ORDNANCE SURVEY IRELAND LICENCE NO. CYAL50167032 (C) ORDNANCE SURVEY IRELAND/ GOVERNMENT OF IRELAND

3. EXISTING SURVEY (MAY 2016) PROVIDED BY KILSARAN

LEGEND

- LANDHOLDING BOUNDARY (c. 36 Ha. / 89 acres)
- PLANNING APPLICATION AREA (c. 32.5 Ha.)
- PROPOSED INERT LANDFILL AREA (c. 17.0 Ha.)
- D1 DUST MONITORING LOCATIONS
- N1 NOISE MONITORING LOCATIONS
- SURFACE WATER MONITORING LOCATIONS
- GROUNDWATER MONITORING LOCATIONS

SLR CONSULTING IRELAND
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN 14
T: +353-1-2964667
F: +353-1-2964676
www.slrconsulting.com

KILSARAN CONCRETE

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

BALLINCLARE QUARRY RESTORATION
INERT LANDFILL & C+D WASTE RECOVERY FACILITY
KILBRIDE (N11), CO. WICKLOW

ENVIRONMENTAL MONITORING LOCATIONS

FIGURE NTS 9

Scale: 1:5,000 @ A3

Date: MARCH 2021

00036.00080.0.16.FIG 2-14.0.Environmental Monitoring Locations.dwg

EUROPEAN OFFICES

United Kingdom

AYLESBURY
T: +44 (0)1844 337380

BELFAST
T: +44 (0)28 9073 2493

BRADFORD-ON-AVON
T: +44 (0)1225 309400

BRISTOL
T: +44 (0)117 906 4280

CAMBRIDGE
T: + 44 (0)1223 813805

CARDIFF
T: +44 (0)29 2049 1010

CHELMSFORD
T: +44 (0)1245 392170

EDINBURGH
T: +44 (0)131 335 6830

EXETER
T: + 44 (0)1392 490152

GLASGOW
T: +44 (0)141 353 5037

GUILDFORD
T: +44 (0)1483 889800

LEEDS
T: +44 (0)113 258 0650

LONDON
T: +44 (0)203 691 5810

MAIDSTONE
T: +44 (0)1622 609242

MANCHESTER
T: +44 (0)161 872 7564

NEWCASTLE UPON TYNE
T: +44 (0)191 261 1966

NOTTINGHAM
T: +44 (0)115 964 7280

SHEFFIELD
T: +44 (0)114 245 5153

SHREWSBURY
T: +44 (0)1743 23 9250

STAFFORD
T: +44 (0)1785 241755

STIRLING
T: +44 (0)1786 239900

WORCESTER
T: +44 (0)1905 751310

Ireland

DUBLIN
T: + 353 (0)1 296 4667

France

GRENOBLE
T: +33 (0)4 76 70 93 41